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“NAD always aim for a smooth sound; it’s a property they have built their reputation upon ... The NAD 502 is a forceful and confident CD player that puts plenty of feeling and expression into the music it reproduces ... measures well in all areas ... a smooth easy sound ... in its element playing music with a heavy beat ... NAD has always put sound before servos.” *Hi-Fi World* – May 1993
REGULARS

NEWS. Our ear's to the ground and here's what we found.

NEXT ISSUE. Why wait to buy our October issue to find out what's on offer?

ORGANS. We drag our regulars out of their listening rooms to set pen to paper.

LETTERS. Let your pen go wild on our letters pages.

LEADING. Our experts do their best to solve your problems.

SPECIAL OFFERS. A superb range of some of the best hi-fi accessories around. This month we have introduced a Hi-Fi World designed Solid Silver interconnect and the SME record clamp and more...

AERIALS. Hints and tips for tuner tweakers.

WORLD FAVOURITES. Lean, mean, and back on the scene, our fully updated list is back (with added vitamins).

CLASSIFIEDS. Whatever you want, it's here: second hand, vintage or new.

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Prokotiev
- Symphony No. 5 B that The City of Birmingham Symphony Orchestra

ROCK AND POP

CLASSICAL

JAZZ

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DIAL-A-DEALER. Our guide to your nearest purveyors of hi-fi heaven...

WORLD AUDIO DESIGN. If heaven is building it yourself, take a look at our kits.

READERS SYSTEM. Noel finds a reason to take his listening out of the office again.

COMPETITION

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- 8000DAC digital-analogue convertor

Cambridge Systems Technology Limited, Spiire Close, Ermine Business Park, Huntingdon, Cambs. PE18 6XY. Tel 0480 52521
NEW AMPS
From Harman Kardon, the HK 1200 at £279 and the HK 1400 at £399 are both minimalist line level amplifiers. By doing away with tone, balance, loudness and speaker switching they should offer very high quality amplification for line level sources. The 1200 produces 25W and the 1400 40W.

HARMAN AUDIO
Unit 2, Borehamwood Ind. Park, Rowley Lane, Borehamwood, Herts. WD6 5PZ.
Tel: 081 207 5050.

THE WAIT PAYS OFF
...for anybody holding their breath for the new Audio Innovations phono amp. The P2 phono stage pre-amp is designed for use as a stand alone unit for use with any line level preamp or to complement the Innovations L2 line level preamp.

AUDIO COMPONENTS LTD., Albany Court, Albany Road, Weymouth, DT4 9TH. Tel: 0305 761017

NEW NAKAMICHIS
Those nice cassette deck people have come up with two new amps and a tuner for your delectation and delight. An 80W into 8ohm unit at £649.95, the IA-1; a milder beast, the IA-2, weighing in at £549.95, and the 30 preset ST-2 FM tuner at £349.95. We hope to put some of these through their paces soon.

NAKAMICHI B&W UK Ltd, Marlborough Road, Lancing, West Sussex. BN15 8TR. Tel. 0903 750750

ORELLE ORATORS
...are a new departure for the company, being compact two-way ‘speakers. This rounds their range of products into a complete system. The Orators are available in black ash or walnut finish for £699, or rosewood for £799. Also new is the CD-260 one box CD player at £999.

ORELLE HI-FI, Unit 11, I-MEX House, 6 Wadsworth Road, Perivale, Middx. UB6 7JD.
Tel: 081 810 9388
THE CRUSADER RETURNS

RUARK have brought out the Crusader II, promising improved crossovers, better controlled bass, and smoother treble, and a price tag of £1,495 inc VAT.

RUARK ACOUSTICS Ltd.
Unit 9, Annwood Ind. Est. Arterial Road, Rayleigh, Essex. SS6 7UA.
Tel: 0268 728890

RESPONSIVE ProAc
ProAc have announced a new addition, the Response Four 'aimed at discerning high end listeners', boasting (and I mean boasting) two bass units, two midrange, and one (wot? just the one!) tweeter. All this on a ProAc name speaker. Yours for only £11,995, or £12,995 for the really swanky finishes.

PROFESSIONAL ACOUSTICS, 130-132 Thirsk Road, Borehamwood, Herts. WD6 5BA. Tel: 081 207 1150.

THE MYSTS OF TIME

...have rolled back and revealed the 'new' Tmr tuner. This is the first product to bear the MYST name for five years and the price is still £208.00 exclusive - VAT seems to be the only thing which has changed! If you want one, though, be quick; this is a limited edition, and there will be nothing more...

...except that ATD of Italy have been granted the privilege of using the MYST name on their products, which should be on the market, at least in Italy, next spring.

MYST Ltd, Whitehill park, Weobley, Hereford. HR4 8QT. Tel: 0544 318800
or -

ADT, snc di J Szall & Co. Via Plinio 43, 20129 Milano, ITALY.

GETTING INTO YOUR MUSIC

VITAVOX, purveyors of horn loudspeakers to the rich and comfortable, have launched a new model. The System 191 speaker aims to effectively place the listener in the horn mouth, since the horn is arranged in 'such a way that the walls and floor of the room form the final expansion of the horn'. Are these chaps saying that they can raise the roof? And have they calculated for the six foot Yucca palm in the corner? The 191's have a power handling capacity of 100W and a frequency range of 30Hz - 18kHz. This year the speakers are modelling a chic walnut veneer with a slimline bronze grill, and are weighing in at a svelte 100kgs. The only detail we don't know yet is the price.

VITAVOX, Secomar Ltd. Honeypot Lane, Stanmore, Middx. HA7 1BE. Tel: 081 952 5566.
GLORIANA AT LAST
After a wait of 40 years, the first release of Britten's Gloriana is finally available from DECCA on ARGO CD No. 440 213-2. This work has remained unregarded for some time because, instead of choosing to eulogize the new monarch in this celebratory composition for the Coronation in 1953, Britten concentrated on the personal tragedy of the first Queen Elizabeth. An accompanying book on the work, logically entitled 'Britten's Gloriana' is available for £25+£p&p from publishers Boydell & Brewer.

THE RECORDING: DECCA RECORDS, 1 Sussex Place, London W6 9XS. Tel: 081 846 8515
THE BOOK: Boydell and Brewer, PO Box 9 Woodbridge, Suffolk, IP12 3DF. Tel: 0394 411320

NEW FOR VINYL VULTURES
Mini-system merchants AKAI have come up with two new record decks, designed with the help of British company REGA, for inclusion in their mini-systems. The AP MX570 will retail at around £100 and the better specified AP A950 around £180. The AP A950 will come with a fitted cartridge derived from Audio Technica's AT95E.

AKAI (UK) Ltd. Haslemere Heathrow Est, The Parkway, Hounslow, Middx, TW4 6NQ. Tel: 081 897 6388

GOLDRING'S ELEKTRA
...is a new baby budget cartridge, made in Japan to their own specification - and yours for a miserly £24.95 incl. VAT.

GOLDRING PRODUCTS Ltd, 8 Greyfriars Road, Bury St. Edmunds, Suffolk. IP32 7DX. Tel: 0284 701 101

SOFTER LOOK FOR ARCAM
Arcam's new range, the Alpha 5 series, incorporates the new look used in the recent Delta 290 amp and 280 tuner: sleek, sleek, and expensive.

The 40W Alpha 5 amp will retail at £229.90. There's a matching 16 preset tuner at £199.90 and the Alpha 5 CD player at £449.90. The three come as a system for £899.70, or with the new Alpha 6 £329.90 amp instead, giving remote control of volume, for £999.70.

A & R Cambridge Ltd. Pembroke Ave. Denny Industrial Centre, Waterbeach, Cambridge, CB5 9PB. Tel: 0223 440964

TANNOY
The D100 loudspeaker, the next addition to Tannoy's Definition series, should hit the shops as you read this issue. It is a stand mounted, single-driver, dual-concentric speaker similar to the D700s.

HARMAN AUDIO HAVE MOVED TO
Harman Audio, Unit 2, Borehamwood Ind. Park, Rowley Lane, Borehamwood, Herts. WD6 5PZ. Tel: 081 207 5050.

DCC GOES WALKIES
Those cunning Philips people have managed to bring out a new personal stereo based on the Digital Compact Cassette, plus a whole pile of in-car and home DCC equipment. The DCC130 personal has "special error detection circuits" (although they don't actually mention error correction!) to make this player shock-proof. You can also read while you jog, because it has the usual text info as well. Expand your ears and your mind for a cool £400. You have to pay to be chic!

PHILIPS, City House, 420/430 London Road, Croydon, Surrey. CR9 3QR. Tel: 081 665 6350

PEAR MOVE
PEAR AUDIO, distributor of SHAHINIAN ACOUSTICS loudspeakers, have moved. Their new address is -

PEAR AUDIO, 3 Northumberland Mews, Alnwick, Alnwick, Northumberland. NE66 2RS. Tel: 0665 830862.

RUBBER RINGS FOR GARRARD
Loricraft Audio are now supplying a special damping ring which fits around the platter of Garrard 301 and 401 turntables. At around £5 including £p&p they have to be worth a try.

LORICRAFT AUDIO, 4 Big Lane, Goose Green, Lambourn, Berks. RG16 7XQ. Tel: 0488 72267

AUDI JUMBLE!
One last thing, there'll be an 'Audiomumble' sale of vintage and modern hi-fi at the Victoria Hall, Southborough, Tunbridge Wells, Kent, on Sunday 19th September. Stalls available. For details, telephone John Howes on 0892 540022
Alderley Edge Cheshire Aston Audio 4 West Street SK9 7ES Tel 0625 592704
Amersham Bucks Dejac Hi-Fi 21 The Broadway HP7 OHL Tel 0494 431290
Belfast N Ireland Lyric Hi-Fi 163 Stranmillis Road BT9 5JU Tel 0222 381296
Birmingham Five Ways High Fidelity 12 Islington Row Edgbaston B15 1LD Tel 021 455 0667
Birmingham Griffin Audio 94 Bristol Street BS 7AN Tel 021 1900 1399
Bishopstortford Herts The Audio File 24 & 40 Hockenhill Street CM03 2DW Tel 0277 500576
Brentwood Essex Brentwood Music Centre 2 Ingate Road CM15 8AT Tel 0277 221210
Bury St Edmunds Suffolk Burley Audio 47 Churchgate Street IP33 1RG Tel 0288 724337
Chichester Sussex Chichester High Fidelity 7 St Pancras PO19 1SJ Tel 0243 766402
Christchurch Dorset H.A.T.V. 131 Barrack Road BH23 1JB Tel 0202 275201
Croydon Surrey Spalding Electrical Ltd 352/354 Lower Addiscombe Road CR0 7AF Tel 021 654 1231
Edgware Middx Musical Images Ltd 173 Station Road HA8 7JX Tel 081 952 5535
Exeter Devon Howards (Exeter) Ltd 90/91 Sidwell Street Sidwell Street Roundabout EX4 9PH Tel 0392 58518
Grimsby Humberside Manners Hi-Fi Ltd 2/4 Edward Street DN32 9HJ Tel 0472 351391
Houndersfield W Yors Houndersfield Hi-Fi Centre, 1/6 Cross Church Street HD1 2PT Tel 0483 546468
Ipswich Suffolk Eastern Audio 41 Bramford Road IP1 2FR Tel 0743 217217
Leeds Yorkshire Audio Projects Ltd 46 Headingley Lane LS6 1DF Tel 0532 301500
London N7 Bartlett Hi-Fi 175/177 Holloway Road N7 9LX Tel 071 607 2298
Norwich Norfolk Martins Electronic Centre 85/87 Ber Street NR1 3EY Tel 0603 627010
Nottingham Hotly John Kirk 70 Clumber Street Beeston NG9 1FD Tel 0602 259886
Perth Perthshire Bowers & Wilkins Ltd 516 Slessor Road PH2 8AP Tel 0738 740676
Poole Dorset Martin Audio 46 Kingsway DT1 1JL Tel 0202 963863
Reading Berks Reading Hi-Fi Centre Ltd, 4 Queens Walk, Broad Street MV1 1QF Tel 0734 585463
Sevenoaks Kent Sevenoaks Hi-Fi Centre 111 London Road TN13 1BA Tel 0732 456556
Somerton Somerset Watts Radio 1 West Street TA11 7TS Tel 0398 692400
Worcester Herefordshire Denison Hi-Fi 220 High Street WR1 1BE Tel 0349 582400
York Yorks Vickers Hi-Fi 24 Gilgarg YO3 7EQ Tel 0904 699659

This is not a complete list of QUAD retailers
Visit your Quad dealer and you will find the new Quad 67 CD player, some subwoofers for both the ESL-63 and original ESL and speaker cables surprises.

contact Quad
30 St Peter's Road
Huntingdon PE18 7DB
Telephone 0480 52561
Fax 0480 413403

QUAD
LIGHTNING STRIKES
It is interesting to note that in all your advice on aerials for hi-fi tuners there is nothing mentioned regarding protection against voltage surges or build-up of static charges.

As an underwriter for a very large insurance company I am aware of the considerable number of claims for thunderstorms. It would seem the summer months for TVs, videos and hi-fi equipment, and even cordless phones, damaged by nearby lighting strikes during thunderstorms. It would seem that we have no recognised EEC standard on aerials very shortly, and earthing will be required.

H.P.H. Ebury
Chelmsford, Essex.

We understand the dangers of lightning strikes to electrical equipment. A fascinating book on this subject resides in our library. It describes how lightning, in an attempt to get to ground, jumps from one metal object to another within a house, smashing through walls, ceilings and floors in the process.

A lightening bolt contains a massive amount of electrical power. The field is strongest directly below a thundercloud, reaching some 20,000Volts per meter but, even 5km away, it may be as much 5000V/m. When lightening strikes the average current amplitude is around 25,000amps and the maximum value recorded is around 770,000amps.

Obviously if this kind of power comes into contact with electrical equipment, or for that matter anything else, it will be destroyed. Having a switched earth as you describe may well avoid damage to expensive audio equipment and some form of protection should be considered by all readers. Thanks for your advice and reminder; we'll update our aerial info shortly. DB

THE SPARKLE OF SILVER
I am writing just to thank you for your reply to my letter; which has been published in the June issue. The title you gave it made me laugh enough to trigger my interest in reading on.

In the meanwhile, I succeeded in markedly improving my system by means of some simple - but definitely not really cheap - adjustments which I mention should you find any interest in them.

The Audioquest Turquoise has been replaced by the Audioquest SilverBlue.

Worth every penny out of its £88 price tag (0.75m + WBT plugs, purchased by mail from the manufacturer), this solid core silver cable unmasked the midrange beyond any expectation, bringing voices a little bit forward and vastly improving clarity and detail. Gone is also some high volume harshness. Switching back to the AudioQuest is like wrapping the speakers in cloth.

The Rotel 965 has been replaced by a Meridian 200, and there came the real surprise. Imaging, low level detail, drum hits, bass guitar chords - all given a proper CD recording, instruments "are" in front of you much more than before. It seems very close to Quad, Leak and Radford. Please do not imagine that it is only older readers who like to read about vintage valve equipment. Please continue to publish articles wherever possible on vintage equipment as well as the modern.

The purchase of the Leak Troughline prompted me to dig out old issues of Hi-Fi News from the late 50s and early 60s in the central library in Belfast and I was able to photocopy the original Hi-Fi News review of the Troughline II published in 1962. Looking through the adverts and articles I came across the names of long forgotten (presumably) manufacturers such as Lowther, Whiteley and Jason. Is there any possibility of Hi-Fi World doing articles on the history of specific hi-fi companies? I'd love to find out more about the history (and sadly the demise) of Leak and other companies and I'd be keen to read about what these
companies were like in their heyday and any classic products they were associated with. I realise that Hi-Fi World cannot dwell too much on the past (although people don’t seem to have any problem dwelling on the past when it comes to vintage/classic cars!) but there is clearly an interest among Hi-Fi World’s readership for articles on vintage equipment.

Michael Winnington
Belfast N.I.

At long last I have managed to get my hands on a Leak Troughline which is at this very moment being restored to full glory by Graham Tricker of GT audio. I, like you, had not come across the Leak Troughline until reading about it amongst the pages before I joined the team.

Since then I have been trying to find one at a price I could afford, and it was only recently that this opportunity arrived. I spend a lot of time listening to the radio, mainly looking out for new and interesting music (it’s too expensive to take a risk on a CD these days) and catching live concerts that I cannot find the time or money to go to.

From what I have heard of Noel’s Troughline they can sound pretty special, and in the near future I hope to be able to add one of Tim de Paravicini’s decoders to improve the performance even further.

I agree that we should do more vintage equipment; at least one article per month, but it takes a long time to organise. I think we haven’t done too badly recently with the Garrard feature in May and the American tuners in June. When I get my Troughline from Graham Tricker and fit Tim’s decoder we will try and write more on Leak. DB

The Month

The enthusiasm given by a live performance. I did not buy the Orelle transport (I have already got the DAC) since it was not yet available, but I will audition it as soon as possible.

I am afraid my previous letter sounded like a put-down of the Exposure. Maybe I wrote it in a bit of a hurry, after two or three weeks during which my system sounded horrible, and the local dealer was not able to provide any helpful information. I must add that some time later I received from Exposure a copy of a review published in Stereophile which immensely helped me in tuning the few XV faults which - by chance - were the same I had pointed out.

Well, at least according to my taste, I believe that the Exposure XV is one of the best integrated's I have heard. It is also well beyond its price, and I think an Exposure pre-power combination will be on top of my list later this year. Maybe you would not agree with my point of view, but try listening to the 8000A just after the XV and let's talk about it.

In the meanwhile, Hi-Fi World won a lifetime subscription (after all this reading, you really deserve it. Don't you!). Respectfully and indefinitely yours,

Mauro Benedetti
Rome, Italy.

We have just designed and built our own solid silver interconnect, which is for sale through our mail order section. The benefits we have experienced with solid silver cable are similar to what you describe, notably a smoothness and an increase of detail and openness over copper equivalents. Because most of the signal is conducted through the surface skin of a cable we will also be offering a cheaper alternative using silver plated copper. This has similar properties to that of solid silver, but is considerably cheaper making it excellent value for money. DB

SINGLE ENDED ARGUMENT

There is no mystery about why single-ended amplifiers sound better than push-pull amplifiers; it is well known that, given the choice, most people prefer the addition of a moderate amount of low-order harmonic distortion. The push-pull triode amplifier is, after all, composed of two single-ended amplifiers, with a common secondary, which cancels most of the pleasant second-order distortion which each half produces. The extra driver circuitry is merely the last in a long line of many comparable operations from the microphone onwards.

Surely, if after passing through several hundred transistors in the recording process, there is a difference between valve and transistor pre-power amplifiers, it must be that the valves are adding something and not that the last few transistors are losing it. I think that this preference for single-ended designs confirms this interpretation (although the psychological impact of the price tag probably has a part to play).

It is not necessarily true that the best sounding amplifier is the most accurate: but hi-fi, by definition, is about accuracy.

R A Wooley
London.

After the signal from a microphone has passed through several hundred transistors it is stored on a format such as a CD. From this point onwards hi-fi by definition says that we should do our best to conserve this original information. If you listen to the difference between CD players, amplifiers and speakers it is clear that a great deal can be lost along the final part of the chain. From our, admittedly limited, knowledge of single-ended amplifiers it does appear that they are better at preserving the original than push-pull designs. Our argument is for single-ended operation, not against transistors. For our reader's system this month we visited Geoff Hill of Goodmans Loudspeakers Ltd who has for many years been enjoying a single-ended transistor amplifier. This offers a similar degree of detail and emotion as did the Yoshinos. By the way, Tim de Paravicini also made a transistor version of the Yoshino alongside the valve version, which we have yet to hear. DB

Your argument is conventional and plausible, but not indisputable. Like you, I do wonder at times how it can be that after so much signal processing through solid state circuits, reproduction through a valve amplifier can appear better. Superficially, this does seem to suggest that the valve amplifier is capable of euphonic enhancement. However, it isn't so simple.

For a start, that people prefer a limited amount of second harmonic is an assertion few people are in a position to question - it is not a fact. I spend my life measuring distortion (on an ultra fast and accurate FFT) and listening to the products that make it. I can assure you that second harmonic doesn't enhance; in large quantities it only changes timbre. Second harmonic is not the answer.

Further problems with your argument arise when a valve amplifier better reproduces the properties of a bad recording, as good modern ones commonly do. This strongly suggests they are more transparent to the source. Good ones also reveal far more detail. Even some recording engineers now acknowledge that valve stages, especially early on in the signal chain, improve recording quality.

Heavens, Polygram now use a valve mixing desk and mic preamps at times.

And whilst all those circuits in the recording process might commonly contain transistors, they don't contain power amps driving a dynamic transducer, something that makes hi-fi power amps a unique case.

I sympathise with your views; it would appear at first sight if memory enhancement. Yet when you have the experience, as we com-

Continued on page 17...
The QED SYSTEMLINE is an advanced Audio switching system. Audio and Video sources can be controlled via infra-red remote control from any room in the house.

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For further information on interactive sound and vision systems, please contact Richard on: 081 546 7885 or 0374 163395
REASONS FOR SINGLE ENDED

I read with interest your piece about single-ended versus push-pull output stages in valve amplifiers featured in Hi-Fi World's July issue, and I am very pleased to see that at last somebody is re-starting this age-old debate.

To this end, I would like to offer what we consider to be the reasons that may give cause to the considerable sonic superiority that well designed single-ended amplifiers enjoy over their otherwise seemingly better push-pull counterparts.

1) No zero crossing point disorders, as the output is purely an amplified version of the input signal.

2) Ultra simple signal path, with only 2 or three gain-stages.

3) Absolutely pure and unblemished Class A operation.

4) No phase splitter, which avoids the imbalances caused by time domain differences between the two halves of the wave-form, likewise, the d.c. imbalances in the output transformer that are always the result of slightly different plate currents not present, either.

5) Better damping factor, because in the single-ended output stage the ratio of the valve's plate impedance to the load impedance is generally about 4 times better than its push-pull counterpart.

6) Greater dynamic power per watt than push-pull.

7) The d.c. bias creates a permanent magnetic field in the output transformer of an single-ended amplifier and prevents the flux from going into remanence, in a push-pull (or any other transformer that operates on zero-resultant bias), there are considerable no-load non-linear magnetisation currents demanded from the output valves by the coercive forces or the reverse magnetic field required to reduce a magnetically saturated material from remanence to zero magnetic induction, this non-linear hysteresis loop creates considerable "lag" and instability between the "push" and the "pull" parts of the operation, and add to the problems already created by the phase-splitter.

8) In not canceling the second harmonic distortion from the output stage, the natural harmonic relationship present in the input signal is maintained. In the push-pull stage you effectively "unearth" the third and higher harmonic components, all of which affect the zero crossing point, by cancelling the second harmonic distortion created by the output stage.

To appreciate the importance of this, you have to look at how the human hearing mechanism works; our hearing is far more sensitive to duration and delay phenomena than to small deviations in amplitude. This means that even minute changes in distortion pattern and behaviour in different parts of the bandwidth of an amplifier are very detectable by human hearing, whereas higher overall levels of distortion, as long as they remain constant and even over the bandwidth, are not that audible. It is changes in distortion pattern over frequency that disturbs the ear rather than the overall level of distortion.

As a general comment, the audio industry's preoccupation with amplitude related measurements go completely against the grain of the requirements of the human hearing, which is much more zero crossing point sensitive than generally considered. These are the conditions under which feedback is considered a benefit. Are we really so lazy in our approach to this that we cannot get it into our heads that Humpty Dumpty will never be the same after he has been broken?

You mention in the heading to the PP-SE article that the Ongaku and the Yoshinos are the only single-ended amplifiers in the world. This is not correct; we have for the past three years been marketing the Audio Note Neiro (parallel single-ended 2A3s) and the Kassai/Kegon (parallel single-ended 300Bs).

In Japan there exists a great number of manufacturers of single-ended amplifiers, like Shindo, Audiotekne, Audio Professor, U-BROS and many more. Furthermore, we at Audio Note here in the UK released about 3 months ago a version of the OTO integrated amplifier and its power amplifier in parallel single-ended configuration, dubbed the OTO SE and the PI SE. These are to the best of my knowledge the first parallel single-ended pentode amplifiers ever introduced into the market. We believe the benefits of the single-ended output stage are amply demonstrated in these products.

On a different note, in your reply to Mr. Hugh Gabriel you state that "there are no valve-amp compatible loudspeakers on the market". It is not nice to be forgotten, and may I therefore politely remind you that we have been making loudspeakers with efficiencies of well over 90dB for over two years now, starting with the AN-K at 90 dB, the AN-I at 93/94 dB and the AN-E at 95/96dB. Hi-Fi World reviewed the AN-j/B (93/94dB) in the June 91 issue! But apart from our loudspeakers there are a few others, like Lowther, Triangle and the Homing Agathons which are all examples of loudspeakers with high efficiency and good load behaviour, and I feel we all deserve a mention in this regard.

You know how much I applaud your "drive" towards valve amplifiers (and now single-ended) and thereby efficient, easily driven loudspeakers, and the renewed interest your efforts are creating; but it would be equally nice if you would recognise who brought these technologies to light again after many years of silence in a near certain grave.

There has for many years been a subculture amongst the more knowledgeable engineers, experimenters and audiophiles, who, primarily in Japan, have been investigating, experimenting and discussing the advantages of zero-feedback, single-ended output stages, efficient horn loaded loudspeakers and many other such related subjects. In relation to the broader market, the first real breakthrough for these technologies came with the recognition granted to the Audio Innovations First and Second Audio Amplifiers, and finally the Ongaku which really opened people's eyes to the real quality of the single-ended output stage and put it all firmly back on the agenda. In the rush to join the "bandwagon" as it were, this should not be forgotten.

I sincerely hope that Hi-Fi World will stay above the fray of commerciality and demonstrate the kind of vision and impartiality necessary to act as the referee, as more and more players join the niche market playing field valve amplifiers occupy, and perhaps, one day soon, together we will be able to challenge the transistor wielding, scope-jockey brigade, with proof that they have been wrong all these years. The ultimate beneficiary from this result would, in my opinion, be music.

The Defence rests its case.

Peter Quartrup
Audio Note Co.

The Neiro and Kassai/Kegon continued on page 19 ...
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are both parallel single-ended amplifiers and do not use one single triode as an output stage, such as Ongaku and Yoshino do. All the same we apologise for failing to recognise these other single-ended amplifiers of yours. Perhaps we could arrange a review of these at some time to enable us to continue our research of single-ended amplifiers? DB

I didn’t mention your other amps because I knew for certain that by not doing so I’d get a massive letter from you in response, which would part fill the magazine and give me a welcome day off. Ta! Now where’s the cosy? NK

UPGRADE YOUR EARS

I read, with interest, the letter from Peter Johnson in your March issue; he says that he only has good hearing in one ear. I’m similarly afflicted with middle ear deafness since childhood (one ear only) and recently (I’m now 60) I tried a modern hearing aid for listening to music. On the basis of a short demo I can recommend this rather novel upgrade. Try the NH-IS before thinking of going private, these can cost around £500 and appear to be no better than cheaper versions of the same thing.

Middle ear deafness means the small bones are not working but provided you have normal inner ears and what is called bone-sound conduction, then a hearing aid is a good indoor item and is probably no worse cosmetically than using headphones.

I would not use one outdoors or for continual use, however all the time I can still hear with one ear!

My main hi-fi gear consists of a Marantz CDP-211, Acoustic Research Legend deck with Stilton ATF3 through a Moth Preamp, Pioneer A400 and into Tannoy DC 3000 speakers in a room 22ft x 14ft x 10ft. I’m well pleased with this combo after room changes.

I never need to go past the 9 o’clock position on the volume, rumble infested Garrard 401. In fact I’m well pleased with the changes. Your comments on Yoshino and Ongaku being the only single-ended amps available is not quite right. Audio Note also have the Kegon, Kissi and Neo - these are all single ended.

Is there any enthusiast out there who could help me re-build my Syrinx PU1 pickup arm? New bearings mainly, as I build valve amps, including a very quiet valve head amp, I could repay the favour in kind.

On the subject of quiet valves, the headamp is very critical of valves. The ones I use are Sovtek 6922, a 6DJ/ECC88 substitute. These were supplied by Audio Note and are much better than any others I have tried, including Golden Dragons, as well as being less expensive. Incidentally I believe the pin-out for the ECC88 is in error, pin 9 is the screen, not the heater centre tap. You have to run these at 6V. The Digit DAC mounted on it). Half way through he stopped, listened, and yes you’ve guessed, no more rumble. Actually Mr Sugano of Koetsu fame uses a 401, so it must have some kind of magic.

How about a CD transport and a pickup arm for future DIY projects?

Finally, Tim de Paravicini is correct about the single-ended amps linearity at low levels due to the air gap in the output transformer. I initially thought the opposite would be true, also though, no phase splitter is perfect and imbalances do, I’m sure, result in cancellation of musical information as Noel stated.

Gordon Welford
Cleveland.

OOPS! You have indeed spotted an error in my marking of the pins for an ECC88. As you say, pin 9 is in fact the screen (or shield) and not the heater centre tap. The 6.3V heater winding should be applied across pins 4&5.

We know about the Sovtek 6922 and in fact will be supplying it with the valve pre-amp kit. We did not mention this Military spec version of the ECC88 at the time because we did not know of a regular supplier, but as you have pointed out, Audio Note can supply these excellent valves. DB
Naim entered the tuner market and made their mark long ago with the respected NAT01, something of a progenitor in my view. It set, and it has maintained, a standard of sound quality that remains unsurpassed in solid state tuners. In a nutshell, an O1 gives an unusually smooth, almost warm sound, with superb stereo imaging and an excellent sense of stage depth. Tuners often loose this vital perspective, erased I suspect by the weight of signal processing that goes on. It's where the simplicity of old valve tuners proves to be a great advantage and it also provides a lesson in the compromises involved in tuner design.

Naim followed the 01 with the less expensive NAT02. It lost little except image sharpness and general staging tidness. Now they are delivering the new NAT03 to their dealers. Priced at £499, it aims to bring the unique sound of the 01 and 02 down to a price level that'll compete with the likes of the new Quad 66FM and the Audiolab 8000T.

Simplicity

We've reviewed both of these new tuners and they're extremely impressive performers, available at a price little above the best from Japan. It's into this market niche that the 03 is pitched, head on against some effective competition.

A WARMER FROM

Naim have just introduced the new NAT03 tuner

the frequency display by making it lie dull green until a station is found, whereupon it jumps to full brightness, this happens at a very low level of 10μV. A Signal indicator LED merely mimics this action. The stereo beacon extinguishes below 100μV. Above this low level, no further indication of signal strength is provided, which is a pity. Naim could, and should, use a multi-colour LED as the Signal indicator, making it change colour at differing and higher signal thresholds. Naim-green could come up at 1mV or more, enough signal to put the 03 into full quieting, a condition where hiss sinks to a minimum and - more importantly - sound quality assumes a sort of solidity and
RECEPTION

NAIM

Noel Keywood warms to its reception.

credibility that at lower signal levels is missing on tuners. Such an indication is especially useful for true audiophiles, which any Naim tuner buyer is going to be, I imagine.

Naim tuners behave themselves in use. They don't spit or let through inter-station noise. Designed to be used with a good aerial, the 03 has a higher noise muting level than many tuners, I found. Our aerial provides so much signal that noise usually breaks through when tuning conventional designs. This didn’t happen with the NAT03. However, the downside is that with a poor aerial, noise muting will also eliminate weak signals, but since they will be noisy and nasty to listen to, this isn’t inappropriate, I feel.

Because the tuner’s stereo channels automatically blend together below 100µV, turning stereo to mono in order to lessen hiss, a mono button isn’t provided. That’s another facility out of the window! It also frustrates conventional sensitivity measurements. However, the full quieting threshold gives a good idea of how sensitive the tuner really is. At 1.25mV the 03 is a little less sensitive than its rivals, but not greatly so. Anyone having problems in a fringe area wouldn’t be best advised to consider it, although I’d add a personal rider to this. For me, the Naims are next best to a Troughline in terms of sound quality and this venerable old valve tuner is horrendously insensitive. So if it’s a toss up between valve and solid state, the 03 may just look to be very sensitive compared to the alternatives. However, against its immediate competition from Quad and Audiolab, the 03 loses out, being fractionally less sensitive.

What the NAT03 seems to lose to its rivals, it makes up for in sound quality. Naim have retained the peculiarly characteristic sound of the 01 and 02, which is completely free - unusually so - of that upper mid-band harshness common in VHF FM tuners. The other common drawback on VHF FM is a certain blandness of presentation and lack of stage depth. The NAT03, like its more expensive compatriots, avoids this problem too. In broad outline, it paints up a softly pure and slightly warm sound reminiscent of valves. However, it isn’t as apparently lucid or revealing as a Troughline, so whilst certain comparisons are valid, I feel the 03 is very much a solid state tuner, with all the merits of high resolution frequency indication and stable, drift-free reception.

"across the midband, especially the upper midband, the NAT03 stays soft and pure reproducing speech with a lovely sense of atmosphere"

On Kiss FM, bass lines came across well, having plenty of heft. There was some grumble and a little slurring, the Troughline revealed, but I’d still rate the weighty bass of the 03 as a plus point in comparison with the anaemic sound from so many tuners; it suits Rock in particular. Trawling through the band, generally I found much the same picture. There was some rounding of high frequencies, some muting of sibilance and softening of fricatives, the extent of which surprised me. In spite of its flat measured frequency response, tiddled up with just a bit of treble lift, the NAT03 sounds a little rounded in its treble. Whilst a xylophone in the St Louis Symphony Orchestra should have rang sweet and clear, the Troughline showed, it was drawn back into the body of the orchestra where it failed to display its spinglyh contribution to the St Louis Symphony March. Similarly, a tubaoomphah- ing away happily in the background got just a bit caught up in the general hubbub and had its presence and impact mildly compromised.

Yet across the midband, especially the upper midband, the NAT03 stays soft and pure reproducing speech with a lovely
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Many more new models to be released shortly to add to those already available from the above manufacturers plus: Alphason, SME, Audio Innovations, DNM, Chord, AVI, Micromega, Quad, Denon, Pioneer, Aura, Nakamichi, Mission, Impulse, Ruark, Castle, Rogers and many others.

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MEASURED PERFORMANCE

Naim long ago invested in the expensive and dedicated RF test gear needed to get a tuner right. To some extent they set a standard here that others have since been obliged to meet. The NAT01 and 02 measured well as a result - and so does the new NAT03 tested here. Its frequency response measured flat, with just a trace of high frequency lift, as our analysis shows. This is just enough to ensure a good sense of clarity will be conveyed, whilst maintaining basic tonal balance.

The only peculiarity our analysis doesn't show is a subsonic bass peak in the mono channel of +5dB, down at 6Hz. On a powerful solid-state system with deep bass extension (bass extension in speakers can be gained at the expense of efficiency, demanding more power) this sort of peak can be heard to usefully increase the feeling of bottom end weight, or 'heft'. Other notable products with a subtly audible bass peak are Nakamichi's top cassette decks and the now obsolete Cambridge CD-1 CD player.

Channel separation on stereo measured no less than 50dB at full modulation (maximum volume), but lowered around 45dB - our quoted figure - at 80% modulation, the measurement level. This high level of separation was well maintained right up to high frequencies (36dB at 10kHz), pilot tone phase being accurately set.

Similarly distortion was low, measuring 0.13% (average of mono and stereo channels) at 50% modulation. The little extra distortion that did exist over some tuners was merely innocuous second harmonic in the mono channel. Furthermore, tone accuracy affects distortion, but only a little. When measuring in a situation like this I average a number of readings from tuning in normally, so our result isn't much and precludes the use of passive pre-amps, except where a very sensitive power amplifier, like our own K5881 for example, is being used.

Peculiar it may seem ergonomically, but in the new NAT03, Naim have simply continued their tradition of determined minimalism, combined with excellent performance; this is a well engineered tuner.

NK

TEST RESULTS

Frequency response 12Hz-14kHz
Stereo separation 45dB
Distortion (50% mod.) 0.13%
Hiss (CCIR) -71dB
Signal for minimum hiss 1.25mV
Selectivity at (0.4MHz) 72dB
Sensitivity See text
Signal strength meter none

Distortion

A small amount of harmonic distortion

The NAT 03 has a flat and well extended frequency response.

The Naim has a small amount of low order distortion.
Digital Domain

Dave Berriman assesses Philips' DSS930

Digital Active Loudspeakers and DSC950 Digital System Controller.

Philips' DSS930 digital active loudspeakers offer the next logical step up from the analogue active loudspeaker. It's not a completely digital loudspeaker of course - the woofers and tweeter are analogue and so are the power amplifiers, but downline, in front of these analogue parts, some serious digital signal processing is used.

Perhaps the greatest problem with conventional loudspeakers is the crossover network. Active loudspeakers, in which the filtering is carried out prior to the power amplifiers, allowing them to couple directly to the speaker drive units, offer a solution, albeit a complex one; Philips use their skills in high technology to advance the active loudspeaker into a form that few can match.

The DSS930 loudspeakers, which are mains powered, have to be used with a DSC950 Digital System Controller if all the wonders of digital processing are to be gained. They can be used alone, but performance suffers. The controller contains much of the digital circuitry, accepting both digital and analogue inputs. The latter are Bitstream converted to digital for subsequent processing within this unit.

After all the digital data has been fully processed, it is transmitted - still in digital form - to the loudspeakers, down just one digital lead to each. In each speaker, it is turned back to analogue by a DAC (Digital to Analogue Convertor) before being passed through the amplifiers to the drive units.

The DSC950 has been designed for multi-room applications in which up to twelve loudspeakers in three systems can be daisy-chained using just one phono-type coaxial lead. This carries both channels and all control data around the system. Speaker switching, volume, balance, and input selection etc, are all controllable from the front panel or via an infrared handset.

The user-chosen role (position) of each loudspeaker must be conveyed by setting a small switch at the speaker's rear to Left or Right. Within each cabinet are two 5 1/4 inch polypropylene-coned woofers and one electro-dynamic foil type Isophase tweeter, all made by Philips. The two woofers, purpose designed for the DSS930s, are driven by an 80watt high power amplifier (320 watts on peaks), while the tweeter has its own 20 watt amp (40 watt peaks).

The tweeter has two bitstream DACs to itself, wired in balanced mode for reduced noise and distortion, both
woofers share one pair of DACs. The woofer nearest the floor is rolled off before the upper one at 650Hz, allowing both to operate at low frequencies, while only the top one radiates in the midband. I can only assume the lower of the two is connected to the woofer power amplifier via a passive analog filter (Philips do not mention this in the various brochures, but this is the only way the one amplifier can supply both woofers in this fashion).

In addition to the digital filtering used to split frequencies to the drive units, replacing the crossover, the DSC950 digital systems controller also provides a switchable, compensated mode which effectively does several things in the digital domain. Firstly, compensation corrects for some unwanted frequency-response trends in the woofer (a rising response and a peak, claim Philips).

Secondly, it extends bass below the woofer's resonance frequency using a digital filter algorithm with a dynamically-changing response. This boosts the area below resonance, extending the response to around 40Hz. To protect the woofer from being overdriven, and to allow for the ear's natural increase in sensitivity to bass, the boost is progressively reduced as volume level increases.

Thirdly, with compensation switched on, it linearises the phase response of the system.

Though I have left it until last, and Philips don't really explain it in the brochure, the fourth function is probably the most significant: to correct for the loudspeaker's response in the time domain. To fully understand the significance and advantage of time domain over frequency domain compensation would take another article. But the kernal of it is this. Normal filters, like tone controls and graphic equalisers can only correct for errors in steady-state output by boosting or cutting various frequencies, or ranges of frequencies. The imperfections can be due to resonances and reflections in drivers and cabinet panels and there is no way these can be eliminated by filtering in the frequency domain. With time-domain correction, reflections or resonances (once they have been captured using digital sampling techniques), can be removed by Finite Impulse Response filters having the exact inverse response. Interestingly, accurate time domain compensation automatically corrects the frequency-response aberrations.

In the Philips system, the crossover filtering and compensation are actually performed by the same FIR filters, having a slope of -36dB per octave. Philips claim that the filter characteristics take into account many measurements taken over a half-sphere at 1 metre in front of the loudspeaker, rather than just a single point, making them more meaningful. Because the signal is filtered and processed in digital form, a conventional volume control is of no use (likewise, a conventional analogue filter will not work in the digital domain). Digital volume controls are essential. Here, each digital 'word', representing the amplitude of the analogue signal at any instant, is recalculated at enormous speed while you are listening. The FIR filters work in essentially the same way. The resulting new strings of 'words' represent either a reduced overall volume level or, after the filters, modified frequency phase responses.

**SOUND QUALITY**

I must admit to being somewhat sceptical about this all-digital system (after the 'perfect sound forever' face, what do you expect?). I first fired the system up using the analogue CD input and compensation. Playing a few favourite CDs I rapidly became aware of the neutrality and naturalness of the sound. It had that hear-through quality that reminded me of electrostatic loudspeakers; there was virtually no hint of edge or aggression. I found that the Isophase tweeter was very revealing, yet also easy on the ear.

The whole sound seemed remarkably well integrated, regardless of what I threw at the system. The raucous vocals and driving rhythms of Chrissie Hynde, the primeval rhythms of Stravinsky's Rite of Spring and the sensual sax of John Coltrane were handled evenly. Vocals were excellent, rhythms crisp and driving, string tone clear yet clean and timpani had that crisp whack in which the harmonics and fundamentals seem to arrive at the same time. It's a system that, in motorising parlance cruises like a Rolls and corners like a Mini.

Weak areas? Well there are bound to be a few in any system. To my ears the bass seemed to be struggling to sound well. Sometimes there was no hint of a problem, at other times it seemed slightly soft and lacking in punch deep down. Ironically, bass sounded best when playing loud - presumably because the electronic boost is then minmised. If the low bass boost was removed by switching off the compensation (the only way it can be switched off), the bass became shallow and lacking in depth.

This brings me to my other quibble, which is about the switchable compensation. With it switched in, the bass and treble controls do not function - they are, in effect, set to flat. With it switched out the bass and treble are adjustable, but the system sounds so much better with compensation I cannot imagine anyone wishing to listen without it. Besides deepening the bass, compensation also improves the sense of depth and transparency. It is so much more natural as to sound like two different systems - one very ordinary and the other excellent. There really is no comparison.

Remember, these contrasts occurred with the same drive units and amplifiers. The digital filters are the only parts that produce any change, and then simply by using a different algorithm for computations. According to Philips, it...
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takes eight hours to re-calculate the FIR filter algorithms using a Hewlett Packard Mainframe computer, but once programed such filters perform their feats with remarkable speed. I suspect the compensation on/off switch is there simply to demonstrate how effective this digital filtering system is.

Further listening was carried out using the CD player’s digital output direct to the DSC950’s digital CD input. This sounded significantly more transparent than the pre-amp alone with equalisation switched out, with more musical strands revealed. No doubt this was due to the removal of the CD player’s Bitstream DAC and Philips’s ADC in the DSC950. Two lots of distortion and filtering were eliminated in one go. Treble was crisper and the sound less ‘rounded’. Overall this mode proved more satisfying, but showed a hint of treble brittleness, which I suspect may be amenable to changes in CD transport (a medium-cost Philips derivative was used for testing and this had the advantage of responding to the DSC950’s handset for complete control over player and system).

Taken overall, the Philips controller/loudspeaker combination offers a very different sound to most passive loudspeaker systems. Sheer weight of technology has enabled Philips to achieve results that would have been difficult by any other means, but on the down side, there’s not much scope for dabbling with the sound. What you see (and hear) is what you get.

Apart from my tone control gripe and a slight question mark over the deep bass which, it must be said, goes down deeper than you’d expect from this size box, the design must be judged a success. The sound may simply be too neutral for some; in the fully digital mode these speakers can be just a trifle dry and clinical.

However, at £1,300 for both speakers and stands, plus £400 for the controller, here’s a complete digital system (apart from the source) with an excellent sound at a very reasonable price. On top of that there’s the potential for multi-room use.

MEASURED PERFORMANCE

Perhaps the greatest problem with conventional loudspeakers is the crossover network. In classical design theory it’s just a filter, inserted between the power amplifier and each drive unit, removing unwanted frequencies and at the same time blending acoustical outputs in the desired way to produce a uniform frequency response. At first glance this looks pretty simple - but life is not so easy.

There’s not only amplitude to consider, but phase, both of which are affected by filters: the overall response of the speaker system is seldom linear in both amplitude and phase. I’m sure there are pundits who would argue for hours about the relevance or otherwise of accurate phase response in loudspeakers, but if amplifiers had the phase and group delay characteristics of many highly regarded loudspeakers, there would be an outcry!

The simplest filters are phase accurate, but are not sharp acting enough for all but the best drivers (and then off-axis performance can be variable). Complex filters can be more accurate in phase and amplitude, but the extra components add their own distortions and colourations, which are all the worse due to high currents which must be handled. For instance, woofer inductors can have high d.c. resistance and if wound on a magnetic core can introduce distortion and saturation effects. The more coils there are in the woofer network, the greater the potential for deterioration in sound quality.

One way round many of these problems is the active analogue loudspeaker, in which the crossover is carried out at a low voltage and current level prior to the power amplifiers, (using one amplifier per drive unit). This enables the power amplifiers to couple directly to the speaker drive units, keeping them under better control. Active loudspeakers can contain much more complex electronic crossovers in which unwanted frequency-response and phase trends in the drivers (or due to driver positioning) can also be compensated more elegantly than by using only passive components, and without introducing other problems. With the advent of digital audio it has become possible to take this one stage further with processing in the digital domain using digital filters.

FREQUENCY RESPONSE

![Frequency Response Graph]

with compensation
without compensation

100 1kHz 10kHz 20kHz
Eric Braithwaite finds a winner in Michell Engineering's new Alecto Stereo power amplifier.

Michell Engineering's new Alecto Stereo power amplifier is almost indistinguishable from the wonderful Mono. It has the same dark smoked acrylic base and the same huge black transformer case, as large as a hat at Ascot. It also shares the same upright black heatsink, which never becomes more than lukewarm, but now the four loudspeaker terminals deliver to left and right speakers instead of one pair being for bi-wiring, as they were in the monoblocks. Bi-wiring is possible - I used it with a pair of Harbeths - thanks to the terminals being Michell gold-plated binding posts. You have to use plugs for one set of cables, and bare wire for the other.

The Alecto Stereo has a mite less power than the monoblock version, delivering 80w or thereabouts per channel, I was told (see Measured Performance for actual values) instead of 130w and it's cheaper by £500. In case readers still have sour memories of the Aintree shambles, I'll lay off the racetrack metaphors any minute, but Michell and Tom Evans the designer have decided on a 'horses for courses' approach. Readers who have already forked out for the paired Alectos need not fear their choice has been supplanted by a rebuild that's squeezed the sound of the two into one cheaper package. This only child of two parents is definitely genetically related, but its sound is sufficiently different to make it an alternative choice, not a cheaper clone.

Talking to Tom Evans elicited a couple of points. One, by-the-by, was that his familiarity with the more obscure names of the Furies was more to do with having Greek ancestry than with scouring a Larousse encyclopedia of mythology at bedtime.

More important, however, is his explanation of the Alecto Stereo's ancestry. Friends who heard the Alecto monoblocks when they were in residence remarked on their valve-like smoothness and engrossing tonal colour. For followers of form, its designer reckons the stereo version is an Alecto monoblock with some of the best parts of the sound quality of Leak amplifiers of yore. I'd say he'd succeeded. I was a little disappointed at first, because after the monoblocks had delighted me with some thunderous bass, the stereo seemed comparatively unadventurous at plumbing the real depths of Hades. But I warmed to it rapidly. And warmed is the word. The whole presentation has a golden aura about it that meant it was barely switched off except when other amplifiers had to take its place, and then usually with demands that it should be brought out of the stable as soon as possible and given another gallop over the field.

Over the couple of months I've had it, it never disappointed me again. I'm not going to list long tracts of the records (and CDs, if we're going to be pedantic) that flowed through it, but it ran through The Cure, Chopin, Pink Floyd and Panufnik. Art Blakey and Beethoven day after day without failing a single fence. Mostly, this was with ESL-63s, but Harbeth's splendid little HL-P3s were pressed into service too. It made even Jean-Michel Jarre's Chronologie and the weird Waterboy's Dream Harder, both winners of the Oberstein prize for seriously over-priced rubbish this year, listenable all the way through - once! With the Lemon Trees' Open Book, it didn't disguise the fact that some of the bands' harmonies are close to pastiche, but it certainly made each subsequent playing sound as fresh as the first. This is not an amplifier that squeezes the music dry the first time: it makes you want to come back to it and enjoy it again... and again.

Here are just three examples from the weeks of listening to give a flavour of the Stereo. Ruggiero Ricci's recording of the Tchaikovsky Violin Concerto on an early Decca SXL had a visitor leaning forward in excitement and awe. And later, animatedly discussing his astounding technique and the beautiful tone of the violin. We thought he had a Guamerius - that he does was confirmed by his Paganinnana on the Walter Lily label.
That's insight, for you, and I'm talking about the amp, not the listeners.

The Alecto became something of a reference point for cleanly delineated detail: the percussionist in Dave Grusin's "Mountain Man" strikes two edges of a triangle out at the back somewhere. With most amps you hear a triangle. With the Stereo Alecto you clearly hear the two notes.

Another exemplar of amazing technique is a guy called Catfish Keith I've just discovered, who plays bottleneck country blues on a National Steel like you wouldn't believe. The CD (on Fishtail Records) wasn't quite the quality of his live performance at the Mean Fiddler, but it was pretty damn close. There's just a touch of blowiness about the Stereo which suits the blues.

Third, a different kettle of fish again. This time, the amazing percussion of Art Blakey and the Afro Drum Ensemble.

**THE STEREO**

That's insight, for you, and I'm talking about the amp, not the listeners.

The Alecto became something of a reference point for cleanly delineated detail: the percussionist in Dave Grusin's "Mountain Man" strikes two edges of a triangle out at the back somewhere. With most amps you hear a triangle. With the Stereo Alecto you clearly hear the two notes.

Another exemplar of amazing technique is a guy called Catfish Keith I've just discovered, who plays bottleneck country blues on a National Steel like you wouldn't believe. The CD (on Fishtail Records) wasn't quite the quality of his live performance at the Mean Fiddler, but it was pretty damn close. There's just a touch of blowiness about the Stereo which suits the blues.

Third, a different kettle of fish again. This time, the amazing percussion of Art Blakey and the Afro Drum Ensemble.

**MEASURED PERFORMANCE**

"It's meant to give the flavour of the monoblock at a good price to enthusiasts".

That's an important observation about this new stereo amplifier. It was made by Tom Evans, the designer, when I spoke to him about a problem revealed by measurement.

For the new Stereo was reluctant to deliver full power into a four ohm load, a problem I have encountered before with the Aura VA-100 amplifier. The reason is straightforward enough: the Stereo uses one pair of Hitachi power MOSFETs which alone are unable to deliver enough current to supply a low load without going into thermal limiting.

Tim de Paravicini, who designed for Lux in Japan, told me that the Japanese never attempt to use this device in single pairs. He also said the test most commonly used to emulate real-life operating conditions to assess the likely impact of such a phenomenon is to put high level noise (pink noise) through an amplifier whilst it is feeding a low load. I did this and found that the Stereo was limiting. This confirms that in use, if driven hard it will limit with low impedance loudspeakers (i.e. ones with a nominal impedance of 4ohms or less).

In Britain, 99% of speaker manufacturers use 8ohms as a minimum value, meaning that overall impedance is in fact commonly 10-12ohms. For this sort of speaker, the Stereo is unusually well suited, since it swings lots of volts (28V), acting as the equivalent of a 100watt amplifier. This means it drives high impedance loudspeakers very well. The only reservation I have is that KEF and bow B&W are now lowering impedance to increase the quoted voltage sensitivity of their speakers, as well amplifier output utilisation. These speakers are to be avoided with an amplifier like the Alecto Stereo.

In all other areas, the amplifier measured well. It has very wide bandwidth, low distortion right across the audio band and very low noise. An input sensitivity of 600mV means that passive pre-amps won't match, except with CD players. The servo circuits kept d.c. output offset to a very low level.

The Alecto Stereo has one pair of output devices compared to the Mono's two. It thermally limits into loads of 4ohms or less, which means it matches 8ohm loudspeakers only. This apart, it measures very well. NK

**Distortion**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>10Hz</th>
<th>60Hz</th>
<th>100Hz</th>
<th>600Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.05%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Extended distortion harmonics were produced by the Alecto stereo; this is typical of low feedback MOSFET amps.

**Thermal Limiting**

![Thermal Limiting Graph]

Into a low load the single pair of output MOSFETs thermally shut down for very short periods of a few milliseconds.
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Car Parking: Follow AA signs to Apcoa Business Park, Northern Perimeter road (£6.00).
Horns and transmission lines

I have been trying, since reading your article, to get, buy, or borrow a copy of "The Loudspeaker Design Cookbook," as well as locate 'in depth' material/publications on designing (not copying) folded horn and long path enclosures i.e. including maths, formulas, laws and principles necessary to calculate (and governing) horn shape and driver rear wave path etc. Also, how to choose suitable drivers for these types of enclosure (under what 'threshold' value of Qts, and what other parameters are critical).

These things do not seem to be so critical in transmission line enclosures, as I recently quickly 'patched' together a pair of 8ft lines using budget-priced Blaupunkt full range car stereo speakers; the sound was clean and the bass natural.

I have tried libraries, book shops and electronics stores for this kind of information, but to no avail. Can you recommend any titles or sources (Babani series doesn't go this far and other publications only seem to provide for DIY design copying).

The LEAP program would be of no use to me.

Your request is for 'in depth' material on horns, so the following publications are rather mathematical in their approach, and assume a good familiarity with electrical circuit theory and electrical analogues of mechanical and acoustical systems.

I can recommend 'Design Factors in Horn-Type Speakers' by Daniel J. Plach, (Journal of the Audio Engineering Society, October 1953) as a starting point, as it covers low frequency horn design in good detail, but the analysis assumes 'perfect' horn behaviour, which is seldom the case with practical designs where the mouth and length are smaller than ideal. The particular problems of high frequency horns and drivers are not covered. This paper is reprinted in the AES Loudspeakers Vol. anthology, available from the AES, P.O. Box 645, Bumham, Slough, SL1 8R.

Another paper which should be easy to obtain is 'Horn Loudspeaker Design' by J. Dinsdale (Wireless World, March, May and June 1974). The analysis presented is not as precise as Plach's, and the practical designs given in the third part are open to criticism on several counts.

The book 'Elements of Acoustical Engineering' by Dr. H. F. Olson (2nd. Edition, 1947) contains a rigorous mathematical analysis of horns, together with graphs of throat impedance and radiation patterns for real horns, and copious references. This work is indispensable for the professional engineer, as is 'Acoustics' by Leo L. Beranek, which covers much of the same material. Both books should be available in libraries, and I believe Beranek has been reprinted in paperback.

The June 1993 edition of the Journal of the Audio Engineering Society is totally devoted to horn theory, but the papers are very mathematical indeed, covering the latest developments in finite element and boundary-element analysis of acoustic waveguides. As to the choice of low frequency drivers, I would suggest looking for 12" or 15" units with a low resonant frequency, high dynamic mass and a BL factor of 20 N/A or higher, as I stated in my letter in August's edition. High frequency drivers should be of the compression type for best results.

In order to 'tune' a horn system of your own design, the facility to measure the electrical impedance of the unit versus frequency would be very useful, as would the facility to measure the frequency response. Equipment to perform these measurements is now available least the popular ones, tend to operate on a hybrid of principles. At upper bass frequencies the chamber behind the bass units behaves as a infinite baffle, but as frequency falls the 'line' comes into play, initially acting as a tuned pipe and ultimately as a subsonic, non-resistant, reflex enclosure.

Many titles or sources (Babani series doesn't go this far and other publications only seem to provide for DIY design copying).

Tannoy Westminsters, would you like to build something like these?

Martin Lawrence, Freelance Loudspeaker Consultant

Whilst over the years there have been many DIY and kit transmission line speakers, it is difficult to find an authoritative work on the subject. I believe this to be because of a basic misunderstanding of the principle as applied to actual loudspeaker systems. If such a speaker were truly a transmission line, then the energy from the rear of the cone would be totally absorbed, resulting in a falling bass response. In practice, low frequencies are enhanced by the output from the port.

Commercially available transmission line speakers, or at

The Loudspeaker Design Cookbook, by Vance Dickason, has a chapter on transmission line loudspeakers, albeit a short one. It is available from Wilsmow Audio and I.P.L. You really need to get reprints of articles by Professor Bailey, published in Wireless World sometime back in the Sixties, when he and Arthur Radford worked on the principle, reputedly using an electric train to carry a measuring microphone along the line, to make measurements.

There is very little published info available in the UK on horns or transmission lines. U.S. articles can be found in the British Library, Science Reference Section. You can 'phone the Library direct on 071-323-7494/6. They are currently at 25 Southampton Buildings, Chancery Lane, Holborn, London. Opening times are Mon-Fri, 9.30am-9pm, Sat 10am-1pm. NK
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As the British Summer makes a brief appearance once more, thoughts turn to holidays in the sun and all the paraphernalia which goes with the beach, one important item being the personal stereos. Here we take a seasonal look at what’s new.

Despite CD’s recent dominance in the separate market, it’s the humble cassette that still rules in the portable music domain. There’s no shortage of new models at a wide variety of prices.

The models here range from £22.99 to £149.95 and fall into two main groups, budget (around £35) and quality (around £130). It would appear that your extra £100 buys you compactness, rechargeable batteries, remote control, a smart carrying case and a good deal of street-cred. But does the extra cash result in better sound quality?

Candidates come from six of the big high street names. In this case the budget models came from Sharp, Philips and JVC in the form of the JC-212, AQ6426 and the CX-8 respectively. Representing the quality field are Sony, Aiwa and Panasonic with the WM EX606, PX 727 and the RQ-570 respectively.

The music used for testing purposes was as follows: The pre-recorded version of Dire Straits played cassette whilst on the move! A home recording of Capercaillie Delirium, representing female vocalists. A high quality recording of Frank Zappa using a Nakamichi Cassette Deck I, ‘Jazz at the Pawnshop’ recorded from vinyl using Dolby B to test the machines Dolby circuits, and finally a recording of a Chopin piano recital to clearly reveal speed instability.

I used all the personal stereos with my own pair of Sennheiser HD 560s, as well as those headphones supplied with the machines. This gives an opportunity for the personals to show their best and not to be constricted by their supplied ‘phones.

All the players had some form of bass extension boost control which seems to be an obsession amongst personal stereo manufacturers at the moment - whether or not it’s what the public want is a different matter.

What struck me with the more expensive players was the sexy and sophisticated packaging. All seemed like latter-day Art Deco cassette cases, shedding the hard plastic skins of their cheaper counterparts for slim metal jackets. A lot of thought has also gone into the ergonomics of the more expensive players, one of the bonuses being the “feel-good factor” of slick controls. This is just as well, as materially you otherwise don’t get a lot extra for your money I found.

"Money for Nothing" provides the most played cassette whilst on the move! A home recording of Capercaillie Delirium, representing female vocalists. A high quality recording of Frank Zappa using a Nakamichi Cassette Deck I, ‘Jazz at the Pawnshop’ recorded from vinyl using Dolby B to test the machines Dolby circuits, and finally a recording of a Chopin piano recital to clearly reveal speed instability.

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The Sharp is typical of its breed. It is large and has a cheap matt-finish plastic case, features that are obligatory in this price range. Others include a 3-band graphic equaliser with "X-bass", auto reverse, a belt clip and a pair of banded headphones. All that is really missing is Dolby B. These features are vital at this price level if it is to sell well against competition, more so than its sound quality. Control-wise, I have few complaints.

Chopin’s piano concerto, and turned in a very respectable performance considering its price. There was some pitch instability, but not as bad as one might expect for a machine costing only £23. However, the sound itself was compressed and the piano sounded slightly distant and muffled. Dire Straits quickly showed that the graphic equaliser grossly distorted the sound - this is best used with care! There was also a slight lack of bass, even with the "X-bass" switched in - no bad thing with some types of music where a heavy thumping bass is unwanted, but as most pre-recordeds are bass light.

Frank Zappa had a spacious air on ‘Yellow Snow’, but still a constrained mid-range and a dull top end. Jazz at the Pawnshop lacked vibrancy and many of the subtleties of the recording were missed. The Sennheisers improved things considerably, yet the sound still lacked a little life and was coloured. All in all, The Sharp made a fine effort, one which was easier to listen to than I’d imagined. Mediocre speed stability did not compromise piano music too much and the basic machine proved worthy of upgraded headphones. This is a good, cheap hack machine for the beach.

The Philips is slightly smaller than the Sharp and feels more expensive. It has a smart Nextel finish which makes the Philips more practical, as it is less likely to show the inevitable marks that appear through use. Features include auto reverse, Dolby B, Dynamic Bass Boost (DBB - I assume!), a belt clip, banded headphones and, surprisingly enough for a personal of this price, an eject (Open>) button rather than space for a thumb lift.

The main controls are a little cramped, but still acceptable. Unfortunately the 'Open' button isn't terribly well placed. My only gripe is that the direction switch could occasionally be unintentionally activated in a crowded bag.

The player was plunged straight in at the deep end with the "X-bass" switched in - no bad thing with some types of music where a heavy thumping bass is unwanted, but as most pre-recordeds are bass light.

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JVC CX-8 £39.99

The JVC is close to the Sharp in both size and feel; in other words it appears a little bulky and cheap. Nevertheless, the player is well featured, with auto reverse, Dolby B, 4-band graphic equalizer including "Hyper Bass", twin headphone sockets, metal tape capability, belt clip and banded 'phones. Ergonomically it's like the Sharp too, with few problems, bar the direction switch.

Sonically, the JVC sounded closer to the Sharp than the Philips. What bass there was, was just lower-mid, even with the 'Hyper Bass' turned right up, although 'once again this could be a blessing in disguise to some. The graphic equalizer was also clumsy in operation, just as the Sharp had been.

The Chopin tape turned out to be a pleasant surprise. Light bass suited classical music and the pitch stability seemed very good for the price, yet like the Philips this player did run noticeably fast. Unfortunately, Jazz at the Pawnshop didn't fare at all well. The sound was smeared and less detailed than even the Sharp, probably due to the poor implementation of the Dolby chip. Using a hi-fi quality recording without Dolby, the JVC really sang, especially with a pair of upgraded headphones, although the standard ones aren't too bad. The mid-range of both Frank Zappa and Capercaillie appeared more natural than either of the other two players in its price bracket.

The sound quality of the JVC was a mixed bag, but provided Dolby isn't used it will give a sterling performance with most tapes. A lack of bass will lend itself to some types of music, but bass lovers should look elsewhere. The above-average sonic ability easily outweighs what is a rather bland and bulky appearance. At under £40, JVC's CX-8 is a step up from the Philips and Sharp in value and sound quality terms.

AIWA PX 727 £129.99

The Aiwa came packaged in a large, heavy box of goodies; the player itself is only fractionally bigger than a cassette case! The metal casing is finished in matt black with silver legends and blue and pink panels which look a little incongruous on such a machine.

When you pay £130 for a personal stereo you expect a lot of features. The Aiwa doesn't disappoint: Auto-reverse, Dolby B, logic (i.e. not mechanical) controls with a hold (lock) function and a "multi sound processor" as Aiwa put it - basically a pre-set graphic equalizer with 'flat', pop, rock and jazz settings. There is also a rechargeable 'chewing gum stick' battery and ten minute quick charger (accounting for the weight of the box). An embossed case, AA battery adapter, spare pads and in-ear 'phones with a remote on the cord, which indicates battery condition are also included.

I found no problems ergonomically, which is quite surprising when you consider the number of functions. However, the battery cover is hopelessly flimsy and doesn't look like it would last long. The first thing which I noticed about the sound of the Aiwa was that it was far more up-front and brighter than the other three players, even with the '450s. Unlike the Philips, though, the Aiwa didn't offer clarity at the expense of grittiness and grain.

All tapes sounded smooth and relatively unfatiguing, despite some tinniness with the Aiwa's own 'phones. It had no problem with Dolby recorded tapes either. Jazz at the Pawnshop showed up the natural rasp of the saxophone; this was the first machine to really do the recording justice.

One thing money can't buy it seems is pitch stability and speed accuracy. Whilst the Wow and Flutter was by no means intrusive it was still noticeable on sustained piano notes.

Generally though, the Aiwa sounded like a superior machine and its well balanced, smooth sound was retained throughout the test. What's more, the headphones did nothing to detract from the main unit's performance (bar the inevitable lack of bass with in-ear 'phones). Despite dubious graphics and slightly flimsy fixtures, the Aiwa is a good all rounder.
I expected something special with the Sony, since the company has produced more personal stereos than any other. The WM-EX606 looks very similar to the Aiwa, yet more restrained - it oozes class. It has plenty of features too. Replacing the "sound processor" on the Aiwa is a two stage "megabass" system. Also, there is a music search facility which is very unusual for a Walkman, but quite useful for skipping through unwanted tracks. Once more a smart touch - rechargeable battery and charger and remote in-ear 'phones are all included.

Listening to the Sony highlighted a small operational problem. The volume control became obstructed by the headphone lead making it difficult to change the volume setting.

This player's sound quality was free from any serious gremlins. I felt that of all the personal stereos, it portrayed Chopin in the most natural and listenable way. Despite running a little fast, it was a stable player and displayed a fine level of spaciousness and detail, without suffering edgy treble or bloated bass (provided that the "megabass" is left in its mid setting).

Frequency Response

The Sony should have a bright treble and powerful bass.

Despite the Panasonic being the most expensive machine, there is nothing to distinguish it visually from the Aiwa or Sony. It's beautifully designed, though, with each control giving a sense of purpose, especially the 'open' catch which is like something from a jewellery box, and the two part sliding cassette lid.

Features are very similar to those of the Sony, but with a twin rotor motor and the most bizarre equalizer system I've seen on a personal stereo. Settings include "normal", "heavy", "town" and "train" - somebody's thought about this one!

Even more amazing is the LCD display which is actually part of the remote located on the headphone lead. It graphically shows the equalisation levels for different settings and then, whilst the music is playing, displays LCD musical notes.

One nice feature is the sturdier than normal headphone jack plug, due to an extra collar (in the style of a phono plug).

The sound quality of the Panasonic proved to be something of a disappointment. For starters there was a very limited volume range. I often found myself listening at full volume on pre-recorded tapes (and I'm not usually a head-banger!). Jazz at the Pawnshop was more like it had been on the cheaper machines; lacking in detail and rather recessed sounding.

And classical music didn't fare much better either. Chopin sounded lifeless and less stable than it had on the Aiwa and Sony. Even a well recorded piece sounded flat and undynamic. One saving grace was that at least the speed appeared accurate. The sound did open out considerably with the superior 'phones, but it still couldn't quite match the Sony and Aiwa players overall.

The equalisation settings were also rather crude. The "train" setting sounded awful - just like a poor £30 machine. Panasonic have obviously tried to eradicate the "nuisance factor" of leaking headphones with this setting. Whilst achieving this though, they have also eradicated what little treble detail there was.

The Panasonic's wonderful styling made me want to like this machine, but the bland sound quality, lack of power and ineffective graphic, means that I can't recommend it.
CONCLUSION

You can't have your cake and eat it, it would appear. Although none of the players were shockingly inadequate, neither did any of them manage an unimpeachable performance. Not one came close to showing what is possible from tape. Having said that the Aiwa, Sony and Panasonic are as much about style and status as they are about sound quality. Out of these three (or indeed out of the six) I'd choose the Sony, with the quality. Out of these three - or indeed out of the six - I'd choose the Sony, with the quality.

Of the cheaper machines, I'd have no hesitation in spending the extra money on the JVC. It offered the most rounded sound and had surprisingly good pitch stability. Styling is bland, but at least everything fell to hand naturally.

Philips' AQ6426 was totally the opposite. It had smart and practical styling, but the odd ergonomic flaw and rough sound quality let it down. The Sharp actually sounded a little better. Although you can't expect much for what is the price of two CDs, the sound wasn't too bad; this player offers exceptional value for the casual listener.

It's important to note that all three budget machines sounded far better when their standard head phones had been ditched in favour of something a little more 'hi-fi'; try using Audio-Technica ATH-L1as. If you are serious about music on the go, then save up and buy a Sony Pro-Walkman which beats all these machines hands down, except on size and power consumption. However, it is twice the price of the most expensive here, and so comparison is a little unfair. I felt that the JVC or Sony are best to while away the hours on the beach.

Measured Performance

The frequency response of these players simply tells us whether they reproduce low and high notes at the same level as all others, giving correct tonal balance and avoiding a dull or bright sound. To indicate this condition, all the vertical blocks in our response analyses should be at the same height and on the more expensive machines - notably the Aiwa and Sony - they are. These players will give the most balanced sound with good, but not excessive bass, plus a fine sense of clarity. As Dominic Todd advises though, they really deserve good headphones to be fully appreciated, better quality Sennheisers and Beyers being good choices.

Personal stereos don't hold speed very well, with the notable exception of Sony's direct drive machines like the WM-DD3 and Walkman Pro. You'll hear 0.2% of wow and flutter (cyclic speed variations) as shake piano notes and quivering vocals: it can be annoying or, with Chopin Nocturnes for example, positively destructive. For ordinary uncriritical work, 0.2% W&F is sort-of-acceptable. However, 0.1% or less is necessary for real pitch steadiness and not one of the machines here reaches such a standard, in spite of price.

Reducing battery size improves portability, but it compromises both output level and battery life. Size R6 (AA) pen cells are best; miniature AAA batteries last little time when asked to supply 100mA to a motor. With this current consumption and an end point of 1.1V, around this life is available from an ordinary (i.e. not a Duracell) AA battery. Where a player, like the Panasonic, won't work below a high end point (1.35V) duration is shortened. JVC's CX-8 utilises batteries well; the other players were around average, conking out with battery volts 75% down.

Dominic Todd notes that some players were just loud enough flat out; the output figures show why. The expensive Panasonic delivers half the output of the budget Sharp; under its slick packaging this machine hides some significant compromises. NK

TEST RESULTS

<table>
<thead>
<tr>
<th>Make &amp; Model</th>
<th>Frequency Response</th>
<th>Speed Accuracy</th>
<th>Speed Stability</th>
<th>Current Consumption</th>
<th>Supply</th>
<th>Minimum battery voltage</th>
<th>Output</th>
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<tr>
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<td>200Hz-5kHz</td>
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<td>120mA 185mA</td>
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<td>128mA 155mA</td>
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<td>88mA 200mA</td>
<td>2V</td>
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<td>PANASONIC RQ-570</td>
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<td>129mA 180mA</td>
<td>1.5V</td>
<td>1.35V</td>
<td>360mV</td>
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</table>
"The EAR is certainly powerful, precise, detailed and vivid. In common with other Paravicini designs, it has a very tight grip on every kind of music."

Eric Braithwaite, Hi-Fi World, February 1993

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WHO INVENTED THE WALKMAN?

Many different tales surround the invention of the Walkman.

Simon Cooke has his own views on who invented the personal stereo.

So there you were, bopping away to the Walkman and thinking that these Japanese are really clever guys, and never dreaming that the concept of personal stereo was invented by the Italians. You see, Personal stereo was invented during the Renaissance, by a Venetian trying to get noticed on the way to a masquerade ball. He hired a couple of musicians to follow him around, strumming and playing so that his expensive new costume would get noticed. The idea caught on and, in those days, a really high-class personal would even drag you out if you fell into a canal. The coming of grand opera killed the whole idea, however, because a lot of blokes got very uneasy about their wives being followed everywhere by a couple of strapping gondoliers singing 'O Sole Mio'. The whole idea went out of fashion, and the gondoliers went back to their boats to await the invention of the Cornetto.

The rest is history, of course. The manufacture of the first Sony 'Walkman' is the stuff of legend, a story of internal politics within the company, of how the Sony Chairman, Mr Akio Morita, tried the prototype in July 1979 and liked it so much that - since he didn't need to buy the company - he ordered production to be rushed forward, so the first 'Walkmans' hit the shops just two weeks later.

The details of this story vary slightly, but it is essentially true. Sony, however, do not claim the credit for inventing the Walkman. They were in litigation with a German inventor, Andreas Pavel, who claimed that Sony had breached his March 1977 patent for a personal stereo. Sony won this case with a defence which stated that, since Nakamichi had produced a personal stereo-like cassette player in 1974, before the patent was issued, Andreas Pavel did not invent it. The Nakamichi player, the DT-350, had all the facilities of a portable stereo, such as a carrying strap and headphone socket. It also came with a rechargeable lead-acid battery; not quite as user friendly as Duracells!

The DT-350 did not record, but its sibling, the DT-550, did, and the important point is that, although they were intended for professional use, they could be used for entertainment. In fact the '350 was meant for this purpose. So the modern minstrel, definitely a wife-friendly model, was re-invented by Nakamichi something like six hundred years after the birth of this idea. But you have to say that the original form indisputably offered better sound quality.

Sony brought the Walkman to Britain in 1980, calling it the 'Stowaway' and it sold well. Since then, sales of personal stereos have increased every year; although, Sony has obviously lost out on market share, as their rivals have brought out their own versions. They couldn't copy the name, though, since 'Walkman' is a Sony trademark, and so everybody else is stuck with the cumbersome 'personal stereo' but that hasn't stopped those clever little designer chappies from trying to beat Sony at their own game by cramming ever more facilities into ever smaller cases.

The first basic 'Walkman' took a while to become sophisticated, due to lack of competition, but the rapid rise in popularity of these little gizmos benefitted all the manufacturers. Personal stereos, although popular from their inception, only really took off in about 1982/83, when Sony's competitors actually started competing in the R&D stakes.

Sony soon lost their exclusivity due to the vigour with which their competitors made up lost ground. This still pays dividends for Sony, however, in terms of the kudos which their 'Walkmans' have, and the ubiquity of the name. It is forever associated with Sony, an attachment strengthened by the production of upmarket models of superb performance, like the legendary Walkman Pro.

Funny thing, business: Sony have launched a whole range of 'Walkman' products, like 'Watchmans' and what have you, that rely on the strength of that first success. Yet it in turn relied on the Philips Compact Cassette (after all, who'd buy a reel-to-reel Walkman?). These two companies have had a neat symbiosis going for the last 13 years, yet what happens? The next stage of product development leaves us with CBS (as was) titles not being released on Philips' DCC system, and Polygram (owned by Philips) similarly shunning Sony MiniDisc. If they keep this up, we won't see another success like the 'Walkman' for a long, long time.
The Magnums seemed to take delight in surprising me, and making me leap across the room to check my wiring skills, in case I had done something wrong. You can, I suppose, take that as reading that the Magnums are not a relaxing speaker; I probably got a whole month's worth of exercise in the time that I was listening to them, but I can't say that they had me dancing around the room with delight.

So what do you get for your £190 odd pounds? Two lightweight and hollow-sounding boxes, each with a 200mm polypropylene bass driver and a 19mm aluminium-dome tweeter, both made by Goodmans Loudspeakers Ltd. Behind the tweeter in the back of the box lies a large reflex port and below it two binding posts, which are irritatingly angled downwards at about 45 degrees so that, if your gold-plated bananas are, like mine, not in the spring (sorry) of youth, all you need do is raise the volume, and your speaker cables will be shaken out of the sockets to slide gracefully to the floor. It’s a small point, I know, but an aggravating one - and it could short out your amplifier, with disastrous consequences.

Once I had set the Magnums up, they gave quite a good account of themselves - at first. Their timing was crisp - until I threw some really complex vocal arrangements at them - and the tonal quality acceptable, which surprised me as I don’t generally like polypropylene drivers. To me they usually make everything sound thin and plasticky. The only time this occurred with the Magnums was with Jan Garbarek’s sax on ‘Chorus’ (ECM 1288). The top end was unfortunately splashy, and could be quite painfully shrill on transients and strings, especially steels. This seems to be a tendency of metal dome tweeters.

In the upper-midrange the Magnums tended to be rather forward, kicking out piano and sax notes in this register with violence, so as to disrupt the image description. In the lower midband, the speakers behaved themselves, but gave quite a grainy presentation. Down amongst the bass notes, the Magnums seemed to lose all interest in the music, giving an empty performance without any ‘kick’ or drive. I tried numerous CDs which have, in the past, tuned me to my seat with the bass. With the Magnums, I can only report that I had no trouble standing up to raise the volume or, once again, to check my wiring. The bass response was so flaccid in fact, that the ‘Mouth Music’ CD (TERRACD 109) had the driver flapping, producing little impact, and that at no very high volume level on the amp, so the system wasn’t under strain.

The strange thing is that not all of the traits which I have mentioned above seemed to be particularly consistent with, for instance, harp strings being portrayed with bitter astringency, and yet solo violin, which suffers at the hands of most hi-fi, giving a quality performance. Another wiring check...

"Driven by an integrated Creek amp the Magnums sounded as though they could party all night and off into the sunrise."

The overall feel of these speakers was not an inspiring one; they never really seemed to want to come out of their boxes and sing. These are not speakers for Zen novices like myself who harp on for hours about imagery and sibilance, bass response and subtlety. No. These speakers are not for those shrinking violets who don’t even switch their hi-fi on for fear of popping an expensive tweeter. These speakers are made to do one thing: PARTY! The harder you drive them, the happier they sound, until you just can’t be sure whether the sibilance is coming from the speakers, or whether it’s just the volume ringing in your ears, or even the amp in agony. Driven by an integrated Creek amp the Magnums sounded as though they could party all night and off into the sunrise. Then the amp’s overload protection cut in, warning me to back off. The speakers could take it; the amp had had enough. The Magnums need a powerhouse to keep up with their ability to absorb power, if you want real volume.

They aren’t Cerwin Vegas, just giving a nice, easy and, above all, loud performance, and although they may well worry the neighbours, they just don’t derive enough real bass to risk structural damage to your house, yet there is just enough to give reasonable kick to the music. There you have it. Although the Magnums

MEASURED PERFORMANCE

I measured the Magnums after listening to it, to find my comments about its sound largely vindicated. It does have a suck-out at 200Hz, as predicted from listening, but it is an interference suck-out. The near field response of the bass/midrange unit rises steadily toward low frequencies, showing no sign of this problem. Yet from a distance, the suckout exists, at any position in the room. I suspect it comes from port cancellation, even though the port is tuned low, to 30Hz. Stuffing the port with damping material lessoned the suck-out, but it also weakened low bass.

The bass/midrange driver itself peaks at 120Hz, then it rolls off at lower frequencies, leaving the port to fill in. It doesn’t do this very effectively, because it is tuned too low. The overall frontal response, which reasonably accurately reflects what a listener would hear, can be seen in the response analysis. This shows the bass peak at 160Hz and low levels either side of it. It’s an unusual looking character, one I have not seen before.

This result explains why the Magnums’s bass sounded so unusual. It has a basically falling output below 300Hz, punctuated by resonance at 160Hz, plus port output down around 30Hz. This means there’s light bass, accompanied by heavy bass at two different frequencies, that is, when 30Hz signals exist in the music, which isn’t often. In real life it’s pointless to tune a port much below 45Hz. When you add in the effects of room interaction, then the picture becomes as complex as I suspected when listening. Quite simply, the Magnum needs sorting.

The causes of other subjective characteristics are apparent further up the frequency range. Lack of any sense of real detail or analysis is explained by low output around 6kHz, whilst the slight occasional spit of the tweeter is due to the mild resonant peak visible at 10kHz. The polypropylene bass/midrange unit reaches 1.6kHz - a relatively low frequency - before crossing over to the aluminium dome tweeter. This means the latter handles more music power compared to usual, since it covers more of the audio band. It also puts the crossover frequency further into the

Goodmans first Magnum loudspeaker was a force in the market

Simon Cooke and Noel Keywood see whether its new replacement

World Radio History
are built to party, there are still speakers making a more happy noise for less money. Goodmans have obviously tried to carry the strengths of the Maxims, which we like so much, up into the £180 arena. It hasn't really come off though. The Magnum has lost much of what the Maxim has, or it has just twisted it into an unrecognisable form. At this price level, hi-fi customers tend to want something more than just plain volume, looking for a 'speaker with rather more subtlety and finesse than the Magnums are capable of delivering. I believe.

Noel Says

Goodman's original Magnum K-2 loudspeaker was a real rocker. I used to throw them over the counter all day Saturday at an Edgware Road hi-fi store in London; people couldn't get enough. It was a dynamite value three-way that really delivered the goods.

The new Magnum was meant to revive this success in Goodman's Loudspeakers latest product range. Knowing and liking the Maxim I had every confidence it would, but I have to say that my hopes have been dashed. The new Magnum is beset by problems that ultimately compromise its performance by a significant degree. It gives a box-bound sound, that is quite rich and full, yet tinged with occasionally sharp treble from a not-too-clever aluminium dome tweeter and weighted down with peculiarly slow bass devoid of impact.

I tried to specifically identify the problems (before measurement), but they seemed elusive. The Magnum appeared to lack deep bass on some tracks, then on others there seemed no shortage of it. It had a weighty sound, but yet no real impact. It was oddly slovenly in its bass, yet there was enough togetherness to reproduce Tina Turner's Break Every Rule - a notoriously difficult bass line - with some all-round ability, if not with great precision; I've certainly heard a lot worse.

In the end I had to conclude that the Magnum has not one major weakness, but numerous smaller ones that combine to act in a complex fashion, according to the music played. There's a hint of low-ish bass emphasis, probably from an under-damped enclosure, that adds some slight bass boom and a certain amount of one-note emphasis. There's too much return energy coming out of the box and too much wall flexure contributing to it, creating drone. Put all this together and you get a messy sound at low frequencies, poorly controlled. Lack of bass speed is usually down to low upper-bass energy, around 250Hz, often caused by a shallow suck-out.

If the midband and treble had been more vivacious and appealing, then the bass end of things might well have received less attention from us. As it stands though, the Magnum I would rate as only reasonable at the price. It's basically competent, but it really needs a little more pizzaz if the nation's shop counters are once again to get buzzed by low flying Magnums. NK

ear's region of high sensitivity, which doesn't help integration subjectively, where plastic matches metal.

Overall impedance measured 8ohms, but minima in the impedance curve were low at 4ohms (see the analysis) with the value below 2Hz sinking to a DCR minimum of 3.7ohms - a very low value. By the IEC rating method (1.25 x minimum over working range), this is a 5ohm speaker. The voltage sensitivity of 88dB is quite good within these conditions; compared to other speakers the Magnum goes loud at any particular volume setting.

My view is that the Magnum needs re-tuning and possibly reproportioning to get more balance and lessen various anomalies. NK

Frequency Response

The frequency response analysis reveals some problems.

Impedance

Overall impedance measures 812, but in places the curve dips down to 4Ω. The curve also varies steeply indicating strong reactance in the load.
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The new Definition Series D700 loudspeakers from Tannoy give Dominic Baker a lesson in dynamics.

Looking and feeling as if they were hewn from the trunk of a rosewood tree, Tannoy's new Definition Series D700s are not the kind of loudspeakers that would innocuously blend into the corner of a room. Their beautifully polished wood, gold Tannoy badge and impressive stature beg to be on show for all to marvel at and aspire to. Quality like this doesn't come cheap, but thankfully interest rates are low and loans easy to acquire.

The Definition Series are a statement by Tannoy of what is possible from their well known and respected dual-concentric drive units. The first example is the D700 which has Tannoy's latest development of the dual-concentric unit, complemented by a 10inch bass unit handling the lowest frequencies. Coming soon will be the D100, a stand mounter using a 6.5inch dual-concentric unit covering the full audio range.

Tannoy have been developing their dual-concentric drivers ever since they first used this principle in the 1950s. A dual-concentric consists of a traditional cone shape with a centrally mounted tweeter. This effectively produces a full range, point source loudspeaker. It means that they will not 'beam' off axis in the way that conventional, separated tweeter/woofer systems do. In addition, the sharpness and focus of the stereo image can be improved by a point source.

Weighing in at 41kgs a piece and £1970 a pair, the D700s are a substantial piece of engineering. The cabinets of our review pair were exquisitely finished in real rosewood veneer, but the curved panels give the impression that they have been honed from a solid block. The sides angle inwards towards the rear, which helps to reduce the build up of internal standing waves and, therefore, box colorations. On the slim rear face sit Tannoy's unique bi-wire binding posts with captive links for single wire connection and two - relatively small given the size of the enclosure - reflex ports.

As you may have already guessed from their size, these speakers are designed for 'free-space' positioning. Man-handling them takes quite a bit of effort and could...
be potentially quite dangerous if, like me, you put the spikes in first. Since 41kgs pushing down on a spike constitutes a considerable pressure, I would recommend making sure they are best installed by a friendly hi-fi dealer.

Fortunately, the D700s required no running in (something that would certainly have been a deafening experience). Tannoy's Marketing Manager, Ken Weller had been using them for around six weeks before we took delivery. The D700s are well extended at either frequency extreme and will quickly show up any source/amplifier that is vague and lacking control in the bass, or gritty at the top end. There is a lot of cone area to deal with and the strongly varying impedance suggested that a transistor amplifier would be their best driving partner. A valve amplifier would struggle to drive these speakers at their best, even if their whopping 93dB sensitivity. This was a bit of a shame; at times the treble could become knife-edged, a property a clean sounding valve amp may well have blunted.

After experimenting with several different amplifiers and DACs I had the D700s running beautifully, placed 3ft from the rear wall and two feet in from the sides. They were as fast and dynamic in their delivery as Tannoy's literature suggested they should be. It's strange how, after listening to a great number of loudspeakers, you can predict the basic sound and character of a 'speaker before even plugging it in. Polypropylene drive units have a particularly strong character to them that gives a smooth, rich kind of flavour to the presentation. The D700s were no exception here, and in this respect they could not be described as having a neutral personality, but then all drive units suffer from some sort of coloration due to the material used for the cone.

One thing that instantly struck me about the ’700s is the way the three units integrate together. Having the tweeter concentrically mounted in the centre of the midrange driver ensures that they represent a near point source. This gives them some of the qualities of a good miniature, such as improved focus and imagery, creating a remarkably coherent ‘speaker. The mid-range driver crosses over very smoothly into the bass. One of the reasons for this may be the choice of units. It’s much more difficult to successfully integrate a 4inch mid driver with a 10inch bass unit, especially if one is paper and one plastic, for example. Using two very similar units means that their characters will be near identical at the crossover point, making the task easier and the outcome successful.

As is the temptation with all floorstanders, let alone one which the manufacturers are marketing as a statement in definition and dynamics, I chose a CD with a powerful bass and plenty of attack. The Beloved’s ‘Happiness’ album is recorded with a strong, dynamic, fast and powerful bass of the electronic variety. Here the Tannoy’s delivered everything they promised: huge but firm bass with plenty of attack and a sharply focused mid and top that was projected out, deep into the room. Not once did they become confused or disjointed; in fact they seemed to be smugly confident, teasing you to try more. Even at high levels - and they go incredibly loud if asked - everything stayed firmly in place; these speakers were not bothered by my frantic attempts to find something that would trip them up.

One track that always seems to beat most loudspeakers is the Blue

Tannoy's Dual Concentric drive unit is set in a tapered cabinet.
Aeroplanes, aptly named 'Here It Comes'. On this track, the drums take the lead with a bass guitar coming in after a few bars to form what is, on most 'speakers, a deep underlying drone. The D700s were having none of this. Reaching down, they gripped hold of the bass line and gave it the definition and ability to stop and start cleanly that I have only heard before from Celestion's SL6000 system.

Moving on a few tracks on the same album to 'Missy Lane', which is a comparatively simple track to deal with, the '700s continued their positive attitude. The treble was tonally detailed and clear enough to allow the cymbals to be easily followed note by note, even with a snare drum being struck alongside.

Where these speakers performed like few other floorstanders was in their ability to sharply focus a performer and the members of a band to produce a convincing image across the whole stereo stage. They are not quite in ESL63 territory, but are as close as many other moving coil loudspeakers. Tanya Donelly stood tall and proud between the Tannoy's, with drummer slightly left and to the rear, bass guitar to the left and lead to the right on Belly's album, 'Star'. The ability of a loudspeaker to conjure up a convincing image like this within a large sound stage always makes its reproduction that much more believable for me.

The overall sound of the D700s is one mentioned earlier, unless careful choice of partnering equipment is observed, their sound can go to pieces. I chose to use them with Audiolab's new 8000DAC, which has a flat response and a smooth sound, and with DPA's now discontinued 505 pre/power amplifiers, which have very low distortion. Given this kind of treatment, the slight sting in the treble, that could cause fatigue, was nicely tamed and the combination of the amplifier's grip and the D700s in free space removes any chance of boom from the bass. I suppose what I'm really trying to say is that the D700s, because of their nature, are critical of source equipment and positioning. They are a high definition loudspeaker and will quickly show up weaknesses, but in the right system you would be hard pushed to find such a powerful sound.

Admittedly, Tannoy could probably produce a 'speaker that did the same job for around two thirds of the price of the D700s by skimping on the fancy cabinet work. However, what you are buying into here is an exclusive club where pride of ownership rules. It's a bit like buying a TVR; sure they could make something as powerful for less, but the leather interior, hand finished details and respect that comes with the name are all part of the finished product.

As I would expect, looking for power and performance from their system, the Tannoy D700s should fit the bill. I have to say that they are not for me; I like the midrange to come just a little further forward, the bass to be a little dryer and the overall presentation to be leaner. And my room is of reasonable size and commonly makes speakers sound a little drier in their bass. The D700s should be used in a large room to get the best from them. More than other items, speaker selection comes down to personal choice. In spite of my own reservations, I wouldn't think twice about recommending them to those who want Rock power with a studio monitor presentation. In this respect, there isn't a lot to match them

"One thing that instantly struck me about the '700s is the way the three units integrated together."

Tannoy D700s - £1970
Tannoy Ltd.
Rosehill Ind Est.
Coatbridge, Strathclyde ML5 4TF
Scotland 0236 420199

MEASURED PERFORMANCE

The Tannoy D700s are unusually sensitive for a domestic loudspeaker; for a small signal voltage they will go very loud. Producing 92dB at 1m for a 2.83V (nominal 1 watt) of input, they will overpower nearly all other hi-fi speakers, with the exception of horns, at any particular volume setting. This would appear to make them ideal for low power transistor amplifiers or valve amps without feedback - but not so. The Tannoy's may be voltage-sensitive, but they are not especially efficient, achieving high sensitivity by having a low impedance, which in turn draws lots of current from an amplifier.

Their overall impedance, measured using pink noise, was just 4.5Ω. If this is the average it suggests that there will be places where it drops well below this figure. Plotting the impedance curve showed this to be the case; below 200Hz the impedance curve stays well below the 3.6Ω line and in fact comes to rest at d.c. with a value of just 2.4Ω. Above 200Hz the curve rises rapidly to a peak at around 3kHz before falling steeply downwards. This indicates that the D700 will be a reactive load and may cause low power amplifiers, especially zero feedback designs, some trouble.

Because of their low impedance and reactive nature, I would recommend a high quality solid state amplifier of at least 50 watts, even given their high sensitivity. Especially since these 'speakers have been designed to have a wide dynamic range and will doubtless put quite heavy demands on an amplifier with transistors.

Frequency response was reasonably even in nature, but not exceptional, given the price. The overall trend is one of bass and treble rise through the midrange followed by a treble peak.

The D700s have a long shallow dip in the midrange followed by a treble peak.

The impedance curve dips right down below 3Ω in places.
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HI-FI WORLD SEPTEMBER 1993
Reflections from Noel Keyword

"Out in the real world we are confronted by electrical paraphernalia, not by lumps of sodium whizzing around in circles in jars of water."

We should not be placing so much emphasis on these subjects at the expense of electrical engineering and electronics. Modern schools should have electrical engineering laboratories which, thankfully, are not now confined to the teaching of practical sciences. But how vocationally useful is woodwork and woodworking/metalworking/woodworking on any scale? Is it really as important as woodwork on any scale? Can schools afford lathes, tools and furnaces? They can also afford a few £200 oscilloscopes, some cheap multimeters, signal generators and a few lengths of wire. A simple understanding of fundamentals, using easily understood water analogies, could and should be introduced before O Levels with the option to specialise after that. Then our schools would be equipping people to more easily understand and cope with the machines that they will encounter, like computers and cars, as well giving them the opportunity to choose a career in an increasingly common and important branch of engineering.

To us on the magazine electronics is a hobby, or in modern marketing speak - a passive leisure activity - as well as an important part of the magazine. It's our complete immersion in the subject, from hobby through to design and manufacturing, with electronic (DTP) publishing thrown in for good measure, that illuminates problems in the way the subject is taught. Let me give you a few examples that have come to mind.

How can qualified electrical engineers apparently understand the Fast Fourier Transform, but be unable to understand or design simple audio circuits? Simple, I was told, they chose electrical engineering as a career, without having any innate interest or understanding of it beforehand. I met a contented designer not so long ago who sheepishly admitted that he had given up studying electrical engineering at university because it was too difficult. It can be, but it doesn’t have to be. Electronic theory was a cakewalk for him was a.c. theory, the Fast Fourier Transform, Bessel functions and other daunting concepts. Instead he had been building a radio and having the satisfaction of enjoying what it brings, or - even easier - building a hi-fi amplifier with similar or perhaps better rewards.

Now we get back to early and formative education. People dedicated to audio usually started out tinkering with electronics for enjoyment first - only later did it become a way of making a living as well.

And that is the simple, cheap and effective way of teaching the subject in the nation's schools, with all the potential benefits it can provide us. People of all ages, including teenagers, can understand with radios and amplifiers: they’re a part of everyday life, especially leisure, and they bring enjoyment. They can be cheap to make, easy to understand, enjoyable to use and at the same time provide a fascinating learning experience.

There’s been precious little change in the subject matter of the educational curriculum over twenty-five years, even though the world outside has - and is - changing fast. Electrical and electronic engineering should be taught in schools; audio and radio is a fine way of doing it.
Since buying a Little Bit digital convertor three years ago, I have become an unwavering DPA addict. It seems to be the best DAC at this price point, so when Hi-fi World offered me the chance to hear the new version - Little Bit II - my immediate reaction was to wonder why DPA would bother to upgrade what is, in my opinion, a budget benchmark.

Taking the Little Bit II from the box, I found it follows other DPA products in design. The front panel is adorned with one green power-on indicator LED and the DPA logo. It appears larger than that of the original version, because of its flat alloy panel with rounded corners, instead of a deeply contoured casting with bevelled edges. When Deltec became DPA, this highly distinctive fascia was discontinued, being too troublesome to manufacture. In fact, the only differing case dimension is the depth, since the new version is 55mm deeper. The rear panel contains the same power on/off switch, co-axial input and channel output sockets as the original, as well as an optical TOSLINK input. What’s new is a Deltran output socket for sync. locking the DAC to a transport and a small chrome switch which, looking somewhat like a designer’s afterthought, defeats the Deltran facility if desired.

Enough of the aesthetics, what about the sound? The most important thing to me was that, in general, DPA had not digressed much from that of the Little Bit; in fact, the similarity on first impression was so close that I thought I had managed to connect one of the DACs through the Little Bit Set, by the Scott Hamilton Quintet (CONCORD JAZZ CCD 4254), Chuck Riggs eschews the usual flamboyant drumming of a deeply contoured casting with bevelled edges. When Deltec became DPA, this highly distinctive fascia was discontinued, being too troublesome to manufacture. In fact, the only differing case dimension is the depth, since the new version is 55mm deeper. The rear panel contains the same power on/off switch, co-axial input and channel output sockets as the original, as well as an optical TOSLINK input. What’s new is a Deltran output socket for sync. locking the DAC to a transport and a small chrome switch which, looking somewhat like a designer’s afterthought, defeats the Deltran facility if desired.

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This neatening of the presentation made small details more easily audible, such as the background breathings and tappings on Tom Waits’ Swordfishtrombones album (IMCD 48). These details were there to be picked out when played through any competent DAC, but they were more easily discernible with the Little Bit II. Similarly, the sound of fingers brushing strings on Alan Stivell’s Renaissance disc, by the Scott Hamilton Quintet (CONCORD JAZZ CCD 4254), Chuck Riggs eschews the usual flamboyant drumming

"it portrays single voices, large orchestral and rock arrangements with equal alacrity"

As ever, the internal layout of DPA Digital’s Little Bit II convertor is exemplary. Surface mount technology, as applied by DPA, has raised the state of the DAC market. Miniature surface mount devices are neatly grouped around the board with the input circuits, power supply, DAC, filtering and output drivers all well spaced apart from each other to avoid interference.

The Little Bit II uses the bitstream SAA7350GP DAC chip to perform conversion. This is an up to date Philips device, only bettered in their range by the addition of an external DAC-7 one bit convertor. The frequency response of Little Bit II rolls off smoothly from around 5kHz upward. This will almost definitely produce a softer, warmer top end than normal, which solo for a simple ‘tap dance’ effect of sticks. The Little Bit II presented this with enough space around the sticks to give a revealing impression of their movement, and it was not swamped by the answering...
tenor saxophone. Both instruments remained discrete and defined, yet precisely matched.

The removal of jitter-induced noise by the Deltran link also produced improvement to the soundstage presentation. DPA obviously consider soundstaging a priority, but cleanliness of the new presentation can take it to disturbing extremes.

A good example of this was the final track of the Mouth Music CD (TERRACD 109), which includes vocals recorded in a stairwell. The soundstage dutifully spiralled upwards to follow the echoes, causing my ears to tell me that there was, quite literally, no ceiling. It is this solid and credible stage that provides the Little Bit’s strength; it portrays single voices, large orchestral and rock arrangements with equal alacrity, nailing each source firmly in place before allowing it to sing.

I have probably eulogised enough about Little Bit II, so I should redress the balance. The main problem with the original Little Bit was its sensitivity to dirty mains supplies. Quite simply, it picks up everything, and even DPA’s mains filter, known as The Power, could not totally eliminate interference. Fortunately, the optical linkage solves this problem, but even the upgraded RF filter circuitry does very little to improve the situation when the co-axial link is employed. On the subject of interference, my advice is simple: if you are not thinking of using the optical output, beware!

I only have one other small caveat, which is that the Little Bit II can sound a little thin if wrongly partnered. I used it with a TEAC R-500 Esoteric transport with Cambridge Audio C 100/A70 amplifiers and Gale 301s. In this system the optical output fell prey to the astringent high end of the amplifier, whereas the co-axial output was gutsy enough to hold the fort. In this, the new convertor is probably a little more choosy than its predecessor, although by no means a difficult partner.

In summary, then, the Little Bit II is a worthy successor to the mantle of starter product in the DPA stable, demonstrating the traits of their more expensive models at an accessible price. DPA DACs are designed to be noticeable only by default, preferring to stand back and let the recording breathe rather than stamp their character over the basic sound. In this they are reasonably successful, giving a clear, clean performance of any genre of music. It is especially involving for the kind of listener who wants an exact replica of the stage between the speakers, even if the character of the music is not necessarily to everyone’s liking.

Now the under-£500 DAC market is becoming much more competitive, with the advent of products such as the Micromega Microdac and the Audio Alchemy Digital Decoding engine, the Little Bit II will have a harder time than the original version did when it was launched some years ago. However, by building on their foundation of clean performance within a well defined soundstage in this way, I feel that DPA can look to hold on to a good slice of this market for some time yet.

DPA Digital Little Bit II - £450
DPA Digital, Unit 7, Willowbrook, Tech Unit, Crickhowell Rd, St Melons, Cardiff, CF3 6E1.
Tel: 0222 795621

DPA Digital Little Bit II - £450
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**TEST RESULTS**

<table>
<thead>
<tr>
<th>Frequency results</th>
<th>4Hz-21.25kHz</th>
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</thead>
<tbody>
<tr>
<td>Distortion (%)</td>
<td></td>
</tr>
<tr>
<td>-6dB</td>
<td>0.0056</td>
</tr>
<tr>
<td>-3dB</td>
<td>0.011</td>
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<tr>
<td>-90</td>
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<tr>
<td>-90dB dithered</td>
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<tr>
<td>Separation (dB)</td>
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<tr>
<td>1kHz</td>
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<tr>
<td>2kHz</td>
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<tr>
<td>Noise with emphasis</td>
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<tr>
<td>Dynamic range</td>
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</tr>
<tr>
<td>Output</td>
<td>105dB</td>
</tr>
</tbody>
</table>

**Frequency Response**

Response rolls off smoothly from around 15kHz.

**Distortion**

Highish noise floor and some 2nd harmonic distortion.
A WORTHY SUCCESSOR

We all liked the original Denon PMA-350 amplifier for its punch and detail, now Dominic Todd finds the 'II' has even more to offer.

Denon always seem to have been a little behind other Japanese manufacturers with hi-fi trends. They were late onto the scene with British-style amplifiers, following in the wake of Pioneer, Marantz, and Sony. Their latest incarnation is the Denon PMA-350II (yet another Mark II derivative!). It comes onto the market a full year behind the well received, improved Pioneer A-300X, a natural competitor.

This is not necessarily a bad thing; it could be argued that it allows Denon to stand back and take time to produce a well thought out product. Denon research shows many customers are unhappy with "stripped down" minimalist amplifiers (having experience of retailing, I'd say this is true). Therefore the amp is fitted with tone controls and speaker switching for two sets of speakers.

Other controls gracing the smart metal facia include a smooth acting volume control, balance, headphone socket, a source direct switch and slightly clumsy input and recording controls; one switch and two buttons aren't as effective as separate record and listen controls. Whilst not being particularly heavy the 350 is nicely finished, better than an equivalent Pioneer or Marantz for and audio-grade relays and you have an amp that also appeals to the audiophile.

After a thorough running in period I auditioned the Denon using a pair of well used Heybrook Solo's. A speaker which can be ruthless in showing up lesser amps, and requires the sort of power the 84watt Denon can offer.

Donald Fagen's new album was first to slip into the CD player. It's a well recorded piece boasting an extremely deep and powerful bass line. The Denon really brought these tracks to life. The bass guitar was reproduced in its fullness and the notes were sustained; what's more it had real depth and articulation of low frequencies. Yet this tightly controlled bottom end didn't come at the expense of the rest of the frequency range, nor did it ever dominate. Vocals were well projected.

“The Denon really brought these tracks to life - it had real depth and articulation of low frequencies.
with the Denon allowing the speakers to image freely. If there was one black mark it was a slight steeliness between upper-mid and lower-treble that could occasionally bite.

This had less of an affect on female vocalists than I'd imagined. Jennifer Warnes' "Famous Blue Raincoat" by Leonard Cohen possessed a clean and natural mid-range that reminded me of a good valve amp at times. I know it's been said many times before, but it really did seem as though Jennifer was there in the room singing live. Unfortunately the saxophone sounded a bit weedy and there was a touch of sibilance, but neither were really annoying and could be minimised by careful matching of ancillaries and cables. There were no problems with the double bass which reinforced the track as it should do.

With the slightly weedy saxophone in mind I tried a Danny Thompson piece (progressive folk/jazz) which would expose any flaws in the upper-midrange. On "Wild Finger" Danny's bass thundered along with real gusto. The alto sax was perhaps a touch stringy, yet it didn't seem to matter much as the whole performance was so musical and alive. Yet this didn't come at the expense of detail.

Larger orchestral pieces showed that there wasn't the scale and dynamics of the line level inputs. Nevertheless, in many ways this is a blessing as many budget and even mid-range turntables possess a rather veiled and soggy bass response. The clean bottom end is the perfect antidote for arms such as the Rega RB250, which can wallow a little at these frequencies. Tailoring the phono board frequency range in such a way has also meant that there is little woofer flap that often bugs vinyl reproduction.

Whilst I respect Denon's decision, I tend to prefer amps without tone controls. All my listening was done with the source direct button pushed in, which did make a small difference to the separation of instruments. I found the tone controls were best left untouched as they significantly altered the tonal balance if used heavy handedly.

What surprised me most about the Denon was the way it managed to be musical whilst still showing good technical presentation. A few rough edges around the mid-upper range are chinks in an otherwise highly polished musical armoured. I also think the input/output selectors could be tidied up a little, but other than that have no complaints with the design of the amp.

However, anyone buying this amp should take care with matching components. Choosing an ultra smooth CD player or turntable and bassy speaker would be over egging the pudding. Not that the Denon is speaker fussy; quite the opposite in fact, it will happily drive difficult loads. Don't go away with the idea that here is the amp you've been looking for to fit between your SME20 and Naim DBL's either!

Whilst being a first class player in its price range, like all amps of its price it does move out of its depth with high end equipment. That having been said, I certainly recommend an audition and suggest it would make the heart of a very good budget/budget-mid range

Denon PMA-350 II - £219.99
Hayden Laboratories Ltd, Chiltern Hill, Chalfont St. Peter, Bucks. SI9 9UG
0753 888 447

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**MEASURED PERFORMANCE**

This is a carefully tailored amplifier. The fact that it is bandwidth limited on CD and phono inputs alone shows it has not been designed wholly in Japan, since the Japanese get sloppy on important matters like this. This amp hits 20kHz - just - then output dies away. In fact, it starts to fall within the audio band, which is a bit risky, reaching -1dB at 20kHz. I'd expect some warmth in the sound as a result, but the treble is likely to be clean.

Careful attention has been paid to low frequency extension too. On CD the '350 reaches down to 8Hz (-1dB), just low enough to strongly reproduce the clean sub-sonics that exist on some CDs. Via LP (phono), however, output has been rolled off higher up, below 30Hz to attenuate warp signals and lessen cone flap. Again, this sort of thing is rare on Japanese amplifiers, even if it is within the IEC time-constant specification for disc stages. Warp filters make LP bass sound tight, but often detectably just a trifle light.

Power output was a substantial 84watts into eight ohms and there was plenty of reserve for lower loads, 132watts being delivered into four ohms. Distortion levels were very low at all frequencies, remaining below 0.01% even when delivering full output at 10kHz, a stiff test.

The disc stage was well engineered in all areas, being sensitive, quiet and resistant to overload. As a cartridge load it acts as 47kΩ with 220pF in parallel, values that are correct for most moving magnet cartridges.

The PMA-350II has been very carefully specified in all areas to meet a particular design philosophy. It should sound clean and powerful as a result; it may well possess some magic. Only listening can tell. It certainly is very thoughtfully engineered. NK

**TEST RESULTS**

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<tbody>
<tr>
<td><strong>Power</strong></td>
<td>84watts</td>
</tr>
<tr>
<td><strong>CD/tuner/aux.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Frequency response</strong></td>
<td>8Hz-23kHz</td>
</tr>
<tr>
<td><strong>Separation</strong></td>
<td>71dB</td>
</tr>
<tr>
<td><strong>Noise</strong></td>
<td>-96dB</td>
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<tr>
<td><strong>Distortion</strong></td>
<td>0.007%</td>
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<tr>
<td><strong>Sensitivity</strong></td>
<td>180mV</td>
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<tr>
<td><strong>dc offset</strong></td>
<td>2/2mV</td>
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<tr>
<td><strong>Disc (MM)</strong></td>
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<tr>
<td><strong>Frequency response</strong></td>
<td>28Hz-20kHz</td>
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<tr>
<td><strong>Separation</strong></td>
<td>65dB</td>
</tr>
<tr>
<td><strong>Noise</strong></td>
<td>77dB</td>
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<tr>
<td><strong>Distortion</strong></td>
<td>0.008%</td>
</tr>
<tr>
<td><strong>Sensitivity</strong></td>
<td>3mV</td>
</tr>
<tr>
<td><strong>Overload</strong></td>
<td>170mV</td>
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</table>
The music lovers of Great Britain are no longer strangers to the concept of ‘High End Audio’. When Absolute Sounds was founded quality audio components did not exist, back in the late 70’s we pioneered the concept of high quality music systems.

Our years of experience have contributed in making us the absolute leaders in the field, with a reputation of refining and matching high quality hi-fi systems worldwide.

Absolute Sounds was created for the purpose of making your choice a wise one. To provide equipment worthy of the connoisseur, Absolute Sounds has searched the world for components without equal and tested them for excellence.

Absolute Sounds
58 Durham Road
London SW20 ODE
Telephone 081 947 5047
Facsimile 081 879 7962
In very many ways an optical link appears to be the ideal solution for joining two pieces of digital audio equipment together. Obviously a link which has no electrical contact cannot introduce ground-loop interconnection problems, short-circuits or crosstalk. Also, because the bandwidth of an optical link is so high, it would appear from a superficial inspection that an optical link would provide the very fastest (and therefore "cleanest") signal path possible and that it would introduce the least distortion into the digital audio waveform.

No doubt these considerations account for the adoption of the optical digital interface being included on many pieces of consumer digital audio equipment in favour of the apparently simpler coaxial electrical interface. (My own DAT recorder and CD player included!)

Yet all is not right with the consumer optical digital audio interface, the TOSLink” style link popular in consumer equipment is widely regarded as sounding a little less crisp than its coaxial, electrical counterpart. There are a number of possible reasons for this. They all concern the limited bandwidth of any cheap optical interface: In the first place the speed of the link is compromised by the relatively slow light emitting diode transmitter and phototransistor receiver which are both internal to the connector shells.

Secondly, cheap optical fibres, which allow the optical signal more than one direct path between receiver and transmitter (the correct term is multimodes), cause a "smearing" of the digital audio pulses in the timedomain resulting in an effect known as modal dispersion. Such smearing of the digital audio data can cause a degree of timing instability in the positions of the data transitions (jitter) and this can effect sound quality. One can conclude that a cheap optical interface may actually provide a poorer transmission channel than its simpler electrical brother.

The only advantage such a link can have over its coaxial counterpart is its freedom from ground-path induced interference signals such as hum and r.f. noise. Yet at digital audio frequencies such ground isolation, if it is indeed necessary, is probably much better bought with a transformer. But strict adherence to the IEC 958 Type 2 interface standard for the optical transmitter is exactly the same data-format, bit-for-bit, as that which needs to appear on the coaxial socket (ie. AES/EBU two channel serial digital audio bitsream with consumer use of channel status bits). The optical transmitters fitted to domestic equipment are driven by a TTL signal adhering to this data format. Suitably buffered and attenuated, this TTL signal can be used to drive a coaxial socket on a suitably drilled and modified back panel. The complete modification I devised is shown in Fig. 1. I opted to leave the optical output connected.

The circuit features a cunning use of the cheap and easily available high-speed CMOS hex inverter package HC04. I opted not to use a transformer since I have not experienced any ground-loop problems with modern double-insulated, mains-powered, digital audio equipment. Once there was a time when every hi-fi magazine you picked up contained a forlorn enquiry on the letters page from some enthusiast asking how it was possible to reduce hum from a turntable or tape source. Indeed this was a very real problem in days when nearly all hi-fi equipment was earthed.

However with the widespread adoption of Class 2, double-insulated equipment, earth-loops have all but vanished - or should I say all been silenced? (To digress a little, I have to say that the adoption of double-insulated equipment for audio use is, in my view, one of the greatest steps forward in the last twenty years of the manufacture of hi-fi equipment and it both baffles and irritates me to see how some "audiophile" manufacturers are returning to earthed-frame construction for their equipment.) Fortunately, transformer coupling which is my favourite (though expensive) approach to solving grounding problems in analogue audio is also available in a palliative in digital links and it is very much less expensive and bulky when implemented in a digital audio circuit. Nevertheless digital audio transformers aren't perfect and introduce group-delay distortions which are the corollary of modal dispersion in fibre-optic links so I decided not to use one.

The complete modification (which represents about a days work) result is an electrical interface on a BNC socket next door to the optical output with a signal as clean as any I have ever seen on a coax interface. Indeed the signal proved to be so good it was used as a reference source when developing an outboard DAC. I have now completed this modification on a number of CD players and in every case it brings with it a worthwhile increase in sound quality.

The modification should prove relatively easy for anyone handy with a soldering iron and bold enough to delve into the guts of their hi-fi equipment. Do remember to earth the unused inputs of the HC04 package, failure to do this will lead to increased jitter. Remember too, never work on any equipment unless it is fully isolated from mains voltages and that any modifications may affect your warranty •
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<td><strong>Speakers &amp; Amps</strong></td>
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<td><strong>Savings &amp; Specials</strong></td>
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<td><strong>Speakers &amp; Amps</strong></td>
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</table>

**Turntables**
- Dual CS 503-2: 159.95
- Dual CS 502-4: 199.95
- Nat 5102: 229.95
- Systemekd 1+: 229.95
- Systemekd IXX00: 239.95
- RBX: 239.95
- RBX: 239.95

**Speakers**
- **Specials to Clear**
  - Great Reductions on ex display & new stock
  - **Amps** was now
  - **Turntables**
  - **Speakers**
  - **Savings & Specials**
      - **Amplifiers**
      - **Digital Sound Processors**
      - **Cassettes & Amps**
Are there parts of the music reproduction chain that we are completely ignoring - the vital links without which music wouldn't even exist? I'm not referring to musicians, recording engineers, or even the equipment that reproduces their work, but something even further down the chain. The ear and the brain are the final two parts of the chain that seem to be rarely discussed, but whose response to music can vary by a much greater degree than any pair of loudspeakers.

I think that it is only sensible that we know a little about how our ears work and what information they are receiving. Before I talk about the ears response, it is important to know what frequency relates to what instrument, or vocalist, so that you know, for example, that if the ear is deficient at 3kHz, you will lose the higher notes produced by a piccolo from the orchestra - not the boom from a bass drum!

Neglecting electronically produced music, and concentrating on what I like to call 'real' instruments, music fundamentals cover a range of 1kHz to around 8kHz. So why are we bothered with ruler flat responses up to 20kHz, the normal upper limit set for hi-fidelity equipment? The answer is harmonics. Every note played on a musical instrument consists of a harmonic structure of many frequencies which gives each instrument its individual character. These harmonics are multiples of the fundamental frequency that an instrument produces, i.e. a violin playing a note having a fundamental frequency of 2kHz will have harmonics at 4kHz, 8kHz, 16kHz, 32kHz etc. As they go up in frequency the amplitude falls. It is important for faithful reproduction to reproduce these harmonics up at least as far as our ears can hear.

In Fig.1 you can see the various ranges that different instruments cover and what frequency they relate to. Below that I have reproduced frequency response curves for the ear at various ages for men and women. The graphs are plotted in dB, so to make it easy for you to gauge how much a, say 5dB loss would sound like, try this. Turn up your stereo and mark the position of the volume control. Now ask someone to very slowly turn the volume down whilst you are listening, stopping them when you hear the level change. The smallest difference that you should be able to hear is about 1dB. So if you turn the volume down in a similar fashion, one audible step at a time, five of these steps will give you an idea of what a 5dB drop will sound like.

The graphs may look a little frightening at first, but does it really matter if you have lost 5dB of your hearing across a certain range? It certainly appears that having hi-fi equipment with a ruler flat response is not much use to someone without perfect ears. But, in order to reproduce a live concert, your hi-fi must recreate all of the sounds at the same level as they were in the original. It doesn't matter what deficiencies that your ears may have, as long as the live event and the reproduced one have the same response.

However, it would easily be possible for manufacturers to fit filters to your amplifier that could compensate for any hearing losses that you experience with age, but there would then be a discontinuity between what you heard at a concert and what you heard when you got back home. In fact, some listeners may possibly prefer the hi-fi to a concert because the corrected response of the hi-fi might seem more attractive. Or alternatively they might just find it less real.

In the near future could we see the concept of hi-fi change? Maybe you will be able to walk into a shop, get a machine to measure hearing losses and compute compensation curves. The information could then be recorded onto a card that, when plugged into an amplifier instructs it to produce any necessary compensations a listener might need. We could even see devices that fit in or around the ear so that even at live concerts the sound is automatically compensating for response age related hearing losses when we pick a pair of loudspeakers that have raised treble. Those who are sensitive to strong treble will likely pick a dull speaker. Perhaps this explains why some people will prefer a speaker with a response like a contour map of the Alps, rather than a flat response alternative.

Are we possibly compensating for our ears with our choice of equipment? I think we are to some extent. The ears and brain are complex in the way they work, but also highly variable between individuals, preprogrammed by experience and expectations and very sensitive too. They play an important part in our perception of sound quality.

Dominic Baker

dB on the level
QUESTION FORM

1. How long have Morel been making drive units?
   - 5 years
   - 74 years
   - 18 years
   - 81 years

2. What is the total number of tweeter units found on both loudspeakers?
   - 2
   - 3
   - 4
   - 6

3. Where are Morel based?
   - Huntingdon
   - Ipswich
   - Salisbury
   - Folkestone

4. What type of voice coil can be found on these drive units?
   - Super Ceramic
   - Multi Magnitude
   - Ultra Linear Bass Coil
   - Hexatech

5. What is the approximate volume of Bassmaster's cabinet?
   - 35 litres
   - 12 litres
   - 11 litres
   - 22 litres

TIEBREAKER (obligatory):
Complete the following ditty in no more than THIRTY words.

I like music in the morning
Even more at night
I like a good bass presence
With definition that's tight
Perhaps Morel's new 'speaker

Name
Address
Postcode
Daytime Tel. No
Evening Tel. No

The Competition prize on offer this month is a pair of Morel Bassmaster 602 loudspeakers, complete with matching stands. Although Morel may seem to be relative newcomers to loudspeaker manufacture, they, in fact, have eighteen years experience designing and producing quality loudspeaker drive units at their Ipswich base. Morel's recent expansion from drive unit to full loudspeaker manufacture has resulted in the Bassmaster 602. As its name suggests, this new speaker aims to produce ample low frequency content, to act as a solid foundation to music. Morel has sought to achieve this goal without using multiple, or large-diameter drive units. They have adopted their own unique approach by designing drive units fitted with high powered magnets and large diameter Hexatech voice coils. These improve drive unit performance, whilst also allowing a more efficient crossover to be used.

Although the speakers are a three way design, the '602 uses not one, but two tweeters. They sit alongside a lone reflex-loaded six and a half inch bass/mid range driver. The cabinets sit 'sideways' as opposed to vertically upon their dedicated stands and they are surprisingly small, measuring a mere 16″ wide by 10″ high by 9″ deep, which gives the whole cabinet a modest volume of around eleven litres.

Once the '602s are set to work they quickly show that their name is deserved and that it's not just a product of wishful thinking. Reviewed in our March 1993 issue, we found the 602s produced an extraordinary sensation of strong, clear and firm bass for their size. The Bassmasters not only reproduced bass faithfully, but they had certain 'Studio Monitor' qualities. Their recovery of detail was so strong they invited the listener to be transported back to the recording session.

The Bassmasters combine overall precision, bass tightness and tonal accuracy with excellent build quality. With stands they normally cost £1325. However, the lucky winner of our competition will experience the unique sonic experience of Morel's Bassmaster 602 for free!
Please send your entry form, completed in block capitals, to arrive by 6th September 1993, to:

MOREL BASSMASTER
COMPETITION,
Hi-Fi World Magazine,
64 Castellain Road,
London W9 1EX

In the event of more than one entrant submitting all the correct answers, the winner will be decided on the tiebreak. We will endeavour to publish the results in the November issue. Audio Publishing reserve the right to publish such entries or parts of entries as the company sees fit. We regret that photocopies or facsimiles of the entry form cannot be accepted. No correspondence about this competition will be entered into and the Editor's decision is Final.

Employees of Morel Ltd. and Audio Publishing Ltd. may not enter.

Heybrook Sextet Winner

Heybrook Sextet Competition

Mr. H. G. Timmington of Surrey

Heybrook have decided on “Integra” as the name for their new integrated amplifier coming later this year. Due to the number of entrants who picked this name the winner was picked out of a hat.

Audion Silver Night Delivery

May Issue Competition

Peter Strickland, a headteacher from Tadworth in Surrey, was delighted with the arrival of the Silver Night monoblock valve amplifiers. Both Peter and his wife were amazed with the extra detail this excellent amplifier resolved from their music.
Single minded about single-ended

Geoff Hill, chief design engineer at Goodmans
Loudspeakers Ltd, talks to Noel Keywood about his unique DIY hi-fi system.

Why did you decide to build something as esoteric as a solid-state, single-ended amplifier? There are none in existence. What gave you the idea?

I had a Pye Mozart valve single-ended amplifier for years which I used to listen to when I was with the folks, using a pair of Stax electrostatic headphones. That system gave me an incredibly detailed and sweet sound, but the Mozart has problems. It can’t drive real loudspeakers; it has no control over its bass and it’s not really got any dynamic range. It’s a very clever design but it is limited in what it can do. You need a special speaker for an amp like that.

I wanted an amp that doesn’t really give a damn what you shove on the end of it, that has real bass and will reproduce the top end as well.

But these limitations could equally have convinced you that conventional push-pull was the answer.

No. I wanted an amp where I knew exactly what it would do. A single-ended design using a MOSFET means you can't get any crossover distortion at all, which means that all low level detail has got no choice but to come through. I was more interested in getting together a design that could have as good a low level recovery as possible. You need efficient speakers, but with such speakers you can get more than adequate volume levels. Your speakers have to be big. Big speakers tend to be efficient speakers and they have lower distortion, but they are physically bulky.

Paul Klipsch summed it up nicely: "If I've got a speaker that is 100% efficient it's got to be putting out everything that's going in". Most speakers are 0.01% efficient or less, which means that 99.99% of what's going in isn’t coming out as sound.

That’s an interesting way of seeing it. Alex Garner, Technical Director at Tannoy told us that efficient speakers have got more detail, their expensive studio monitors providing the example I believe.

It’s fact that if you’ve got a big speaker with big cone areas, to produce any given level of input they don’t have to move so far. Distortion comes from movement, so distortion is lessened. That’s why horn speakers can work so well; you’ve got tiny drive unit movements distributed over a massive mouth area, so you are getting the high volume without running the thing hard, so you can use an amplifier that hasn’t got massive power output simply because you don’t need it.

Since 90dB is the level of a road drill - it is very very loud - if you get 96dB for one watt you’ll be running any amplifier down in the milliwatts or tens of milliwatts region, where you’ll get less distortion overall, even though there’s more distortion on occasional peaks.

With a Class B or push-pull amp, you’ve got a point at low levels where the transfer curve changes from one device to another; you’ve got something changing right where you don’t want it. You have to paper over the cracks with feedback.

Has your amp got any overall feedback?

Oh yes, to keep the output impedance down: it’s about 35dB or so.

And the output devices - are they the popular Hitachis?

Yes. Provided you get them above the knee-point they are completely linear, which means they must be biased properly.

I’m told they are highly non-linear and need a lot of feedback.

If you are using them as a matched pair in a push-pull stage, then you’ve got difficulties. The input capacitance of the P channel device is a lot higher than the N channel device. So you have different time characteristics and you can’t match the input impedances to the previous stage.

So, yes, used in push-pull you’ll never get them matched together and that’s the same with a bipolar device, where perfect mirror image pairs are not available for...
In the October Issue

Pioneer a-400x
One of Japan’s best known ‘British’ amps has now been updated. By the time you get our October issue, Dominic Todd will have put it through its paces, and tell all.

Amplifiers Group Test
If you’re looking for an integrated amp between £400-500, this is the review for you. We’ll be taking amps from a range of manufacturers and subjecting them to our usual rigorous analysis. What will make the most of your hard earned readies in this area of the market?

Goldring Elektra Cartridge
To ensure that vinyl is kept from becoming the preserve of rich playboys (and girls), Goldring have entered the fray with a budget cartridge, as covered in our News section this issue. Is this cartridge going to be a giant-killer?

Philips Legend Speakers
Smart new £200 speakers from the people who brought you DCC. They come with elegant and stylish tone arm front baffles, but do they look as good as they sound?

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A recent leader in an electrical retailing trade magazine provoked me to write this month's column. In a nutshell, it claimed that the decline in sales of hi-fi separates is largely due to young people doing nothing else but playing video games. They are so addicted, we were told, as to be incapable of musical discrimination.

The writer neatly ignored the fact that a lot of adults like to play video games - especially on those hand-held gadgets. Just try prising one out of the hands of a 'grown up' trying to get a few more blocks in place on Tetris, or the next stage of SuperMarioland, for example. It's not a lifetime activity, there is room for other things like music: one can even listen to music at the same time (which is more than can be said of TV).

According to the esteemed organ, youngsters have lost the ability to enjoy music. It claimed that the sort of music they do listen to is all bass anyway, so quality reproduction is pointless. Buyers of quality hi-fi are now crusties who listen to classical and jazz - the sort of music which quality hi-fi can benefit, or so the journal said.

To cap it all, the one-make mini/midi and stack systems are now so good, this writer told us, that separates offer no improvement in any case! Customers may as well buy these from small independent retailers (presumably alongside the fridges and colour TVs) and not bother with separates. (If the retailers who read this tell their customers the same story, heaven help specialist hi-fi).

If all this were true, there would be virtually no youth market for cassette personal stereos, yet they are everywhere. Quite honestly, there are enough red flags waving here to enrage a herd of bulls. I plain saw red!

The whole daft argument is based on a lot of false premises. Firstly, young people do not spend most of their waking hours playing video games. This is a popular misconception. They do like music. It may not be the same music which the writer of that leader column likes, but it is music to the listener. The dismissal of young people's music as being all bass and not of any real musical integrity sounds just like the criticisms of the music I liked when I was a teenager. Things turn full circle it seems, at least I have parents generation were of the Rolling Stones and rave than my parents generation. Things turn full circle it seems, I like when I was a teenager. I like the criticisms of the music I real musical integrity sounds just as being all bass and not of any dismissal of young people's music that leader column likes, but it is playing video games. This is a waste most of their waking hours playing video games. This is a popular misconception. They do like music. It may not be the same music which the writer of that leader column likes, but it is music to the listener. The dismissal of young people's music as being all bass and not of any real musical integrity sounds just like the criticisms of the music I liked when I was a teenager. Things turn full circle it seems, at least I have parents generation were of the Rolling Stones and rave than my parents generation. Things turn full circle it seems, I like when I was a teenager. I like the criticisms of the music I real musical integrity sounds just as being all bass and not of any dismissal of young people's music that leader column likes, but it is

Speaking Out

Dave Berriman voices his opinion

though they would never admit it to their peers.

So, the first and second parts of this fatuous argument could be put down to the generation gap. Video games have clearly not destroyed the younger generation's enjoyment of music. It is also erroneous to argue that any particular type of music is not worth reproducing well - just because the commentator does not like, understand or appreciate it.

The final comment that midi systems sound no worse than separates is quite inexcusable. We all know that a decent, well-chosen separates system will beat most one-manufacturer mid-priced sets up with ease. You don't need to be 'golden-eared' to hear the difference. The difficulty is that selecting and getting a demonstration of such a system means finding an experienced retailer with specialist knowledge.

The column in question was not directed at specialist hi-fi retailers, but at non-specialist electrical stores, which prefer to sell a branded system from one manufacturer, without a demonstration, and hope never to see it again. The case for specialist hi-fi retailers would seem to be stronger than ever.

So why is specialist hi-fi in decline. Indeed is it in decline? Hi-fi is not so much in decline in the UK (and Europe and North America) as in hibernation. My personal view is that it has little to do with the advent of video games, the alleged paucity of good music, or even the price of CDs. (I remember LPs seeming so expensive I could only expect to get one at Christmas or birthday time and to buy one for myself was a major event).

I think the reasons are two-fold. Firstly and mainly, there's simple economics. Hi-fi is viewed as a luxury item: when people are hard up, unemployed or worried about their jobs, they do not spend money on luxuries. It is as simple as that. The second is the view that specialist hi-fi is a bit like train-spotting: O.K. if you like that sort of thing, but not for the majority. This attitude is not new, however (remember the old Flanders and Swan ditty 'I never did care for the music much, it's the High Fidelity'. No? Well, you're probably not old enough). Another view is 'I wouldn't hear the difference, so it's not worth spending any more on better hi-fi. It's interesting that the very people who utter these words can hardly believe how good hi-fi can sound - when they bother to listen to it. All the advertising and promotion in the world cannot achieve the impact of the actual experience.

So, if hi-fi is in hibernation (and there are claims that specialist hi-fi sales are now growing slightly in the UK), what will encourage the few people left who spend money on luxuries, to buy hi-fi made by those little-known manufacturers who tend to produce the best sounding equipment.

Economics aside, it must be down to magazines to spread the word about quality hi-fi and specialist retailers to demonstrate it, because unless people know there is such a thing and go and hear it, they are going to be blissfully unaware of its existence, or how good it can sound. If they visit non-specialist retailers, where hi-fi comes in just one carton, the stuff are certainly not going to extol the virtues of separates. This attitude can only serve to help keep the sales (and expectations) of specialist hi-fi depressed.

The one really positive trend which the leader failed to mention is that personal cassette and, latterly, CD stereo have revolutionised music listening. Now music lovers can hear their favourites while on the move, or wherever they may be. A decent pair of headphones plugged into the better examples, especially the

CD-based ones, makes a sound which can be much more enjoyable that those highly-promoted one-manufacturer packages.

This should give the hi-fi unawares listener a hint of the sound quality which could be achieved at home in the living room. The trouble is, that even the best personal stereos are a lot cheaper than separates systems. Persuading people to part with the extra cash is not going to be easy, unless they hear good hi-fi and simply have to buy it to enjoy their music (whatever it may be) even more.

Hi-fi as a status symbol has never been so strong in the U.K. as it has been abroad, which is perhaps why British hi-fi has relied on sound quality rather than gimmicks to sell it. This is what continues to help it sell abroad (mainly in the emerging Far East and the West).

One final irony is that, while it was the Far East - notably Japan - which popularised hi-fi in the West during the seventies (and certainly did no real harm to quality British manufacturers), it is the economically buoyant Far East, particularly Taiwan and even mainland China, which is helping to keep many Western quality hi-fi manufacturers afloat.

If these markets collapse before the traditional home (UK) and mainland European markets pick up significantly, I shudder to think what will happen to many UK manufacturers - but it will have to do with Super Nintendo or Rabba Shanks
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GETTING POSITRON'D

My system at the moment comprises the Arcam Alpha CD player, Naim Nait 2, Arcam Alpha 3 tuner, Yamaha KX-360 cassette deck, Epos ES11 loudspeakers, bi-wired with Linn K400. My musical tastes are mainly Motown, pop and light rock, singers like Tina Turner, Chris Rea, groups like Dire Straits, Simply Red.

I am thinking of adding a DAC to my system. I read with great interest your DIY article concerning the QED Digit. Would this be compatible with the Alpha and the type of music that I like, and are there any others you could recommend? There seems to be a lot of praise for the Audio Alchemy VI.

I am also thinking of upgrading my amplifier. I believe the Nait 2 can be converted to a pre-amp. I was then thinking of adding the NAP 140 power amplifier which will drive the Epos speakers with ease in your room. At a later date you could trade up to a NAC 72 pre-amp, or you may be able to find the recently discontinued NAC 62 available at a good price.

The QED Digit in twin-Positron form gives an unusually detailed and upfront presentation; it offers fine value and would suit your system well I believe. This is a modification worth trying. We suggest you contact QED for Positron power supplies and use our circuit info in the June 1993 Supplement to connect them up to a Digit.

I used Epos ES11s when evaluating the upgrades to the QED Digit. The detailed, powerful and forward sound of the Twin Positron Digit really helped the Epos speakers to display their strengths. I have also heard the Epos working extremely well with Naim amplifiers, although it was with a 42-5 and a NAP 250. I would strongly agree with Noel that you should upgrade to a separate power amplifier. The Epos are not an easy load to drive and I expect that your Nait is struggling. Upgrading to the more powerful NAP 140 should bring about greater control that will tighten up the bass and give a more detailed sound.

DB

ALL ROUNDER

My set up currently consists of a NAD 3130 amp, an Aiwa AD-WX777 cassette player, a JVC JL-B44 turntable with Acoustic Research AR112 speakers and Monitor Audio 7 speakers.

My question is: I wish to upgrade at least one out of the two sets of speakers. Basically I'm hoping for a warmer sound with "bigger" speakers but retaining the surround-sound of four speakers. What speakers could you recommend and which of the ones would you recommend replacing?

Also, I'm considering a CD player. It wouldn't have to be full of facilities, preferably quite basic, but a random feature would be nice, but would this be a compromise for quality? Would you recommend anything particular?

Laurence F Ring

London.

Firstly, you need identical speakers all round for a reasonably cohesive sound. We'd suggest you try and change all your loudspeakers at once for good, modern budget designs. In particular, Mission 760is would give good results, but they may be a little dry in the bass for you. Tannoy 603s give more 'welly', but good sound quality. If you really want big bass then the bigger Tannoy loudspeakers - like 607 IIs - would be best, but they are a bit expensive for the rest of the equipment. Perhaps you...
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Continued from page 65

really should be considering Cerwin Vega loudspeakers, which are big, inexpensive and have a lot of bass; pity about the subtlety though. NK

CASSETTE CRAZY
I am writing to ask your much valued advice on the decision to change from C.D. to cassette. This may well sound crazy, but recent experience of hearing a Nakamichi CR-7E deck has made me seriously consider this possibly rash move.

My current source is a Philips CD 930/QED DIGIT convertor combo, which sounds fine - BUT! It lacks the 'how can I put it - relaxability of my father's Micro-Seki turntable and Sony tape deck. Many pro-analogue journalists have said this "something" is hard to describe, and even 'warm' isn't descriptive enough. The type of deck I could afford, if you thought that this move was wise, would be a Nakamichi DR2 - granted not quite a '7E, but I hope not that far removed.

The main problem I have with my proposed change is the life-span of cassettes. I would suggest that 30 years without serious audible degradation would be reasonable. If however you can assure me that there is no way that cassettes will last that long, then I will consign the idea to the bin.

On another note, may I say how much I enjoy your magazine. I started collecting it from No.6 and have only missed one issue since. The DJY supplements have been very helpful to this "kit-wrecker", as I have been nicknamed by various friends. I hope the flashy reminder that the mag is still only £2.00 is not quite a '7E, but I hope not that far removed.

The not so good bit is that cassettes do suffer wear. I'm sure that they will last thirty years, but if played heavily the oxide surface coating wears and treble is lost; the sound gets gently duller, although not by much (-2dB). Print-through sets in progressively too unless a tape is continually used or wound.

In spite of these problems, surely the most important point to consider is sound quality. Whilst Nakamichis get the best out of tapes, pre-recordeds still remain inferior in quality to LP or CD. They're not usually sharp or nassy (some are, being equalised with treble lift to sound clearer on cheap recorders), but they're commonly a bit muddled, soft in the bass and crude sounding due to smeared treble, caused by tape overload at high frequencies (saturation). You will soon

success in the future. And keep that cover price for as long as you can!

Euan Stuart
Ruthvenfield, Perth.
The good bits first - we've no intention at present of raising the cover price of Hi-Fi grow disappointed with their sound and variability in comparison to CD if you rely on them alone.

It's too early to know whether Dolby S will take off and bring the cassette a new lease of life, but as yet Nakamichi don't have an S spend the £500!

I wonder about different 'speakers for a better sound stage and a cleaner sound. The cable I am using was suggested some ten years ago when reading Hi-Fi Answers which I read on a regular basis (single core from Tandy). The KEFs are on stands away from the walls.

All the hi-fi components from my system are housed on wall mounted shelves, once again following advice in "Answers". The 'speakers are some twenty seven feet from the rest of my system. I listen to LP and CD equally, although the sound is better with the Rega.

Mr B. D. J. Baldock
Eltham, London.

World. The flashy bit was put there because we suddenly realised that most of the other mags had quietly gone up whilst we had remained at £2, our launch price set back in 1991.

In spite of this, the mag has expanded and improved in that time to over 165 pages with the Supplement, making us larger than most of our competitors. It's something we're pleased about, so we'll keep to £2 as long as possible.

The not so good bit is that cassettes do suffer wear. I'm sure that they will last thirty years, but if played heavily the oxide surface coating wears and treble is lost; the sound gets gently duller, although not by much (-2dB).

Print-through sets in progressively too unless a tape is continually used or wound.

In spite of these problems, surely the most important point to consider is sound quality. Whilst Nakamichis get the best out of tapes, pre-recordeds still remain inferior in quality to LP or CD. They're not usually sharp or nassy (some are, being equalised with treble lift to sound clearer on cheap recorders), but they're commonly a bit muddled, soft in the bass and crude sounding due to smeared treble, caused by tape overload at high frequencies (saturation). You will soon

record. If you intend to record your own tapes, then sound quality with metals will be superb, but you will in effect be listening to source quality, namely your Philips 930/QED Digit combo. Recording at high-ish level onto ferric or chrome will soften things out due to mild saturation, but this is a degradation, even if it is aurally benign.

I suggest you listen to a Nakamichi with a selection of pre-recordeds first. I believe you might be better off trying to improve the sound from your CD system. Listen to a Pink Triangle Ordinal convertor with the ultra-smooth eighteen-bit filter installed and take a good look at the rest of the chain. It might just be that your amp and 'speakers are not helping matters by being harsh sounding in themselves.

There's something of a dearth of good loudspeakers in this price region, but the new Tannoy 605-Is may well suit, since they offer good clarity and yet have enough power handling to fill your room.

They'll also conveniently leave plenty of change for other components. In particular, your cartridge could do with upgrading, a Goldring 1022GX being suitable for the Rega. Other loudspeakers to try are the Epos ES11s, which seem to sing in smaller rooms but can sound tubby or even bloated in their bass in larger

CLEAN STAGE

Please can you advise. My system consists of an Audiolab 8000 II new purchase, KEF 104AB very old (fifteen years), Rega Planar 3, P77 cartridge, Aiwa AD-F550 tape deck, Marantz 65 II CD player and a Rotel 84 tuner.

I now have £500 to upgrade my system. Can you advise me on the best way to

continue the idea of pre-recordeds first. I believe you might be better off trying to improve the sound from your CD system. Listen to a Pink Triangle Ordinal convertor with the ultra-smooth eighteen-bit filter installed and take a good look at the rest of the chain. It might just be that your amp and 'speakers are not helping matters by being harsh sounding in themselves.

NK

The Epos ES11s can sound fantastic in the right room.

The Rega is moving from a more open exhaust to a cleaner sound. This can be achieved in two ways. The first is to raise the level of the exhaust by just a few decibels. The second is to reduce the amount of exhaust by using a lower level.

The Epos ES11s can sound fantastic in the right room.
Don't trip up on your speaker cable!

When you invest in good quality hi-fi equipment, why skimp on the cable? Especially now that Ortofon can offer 3 types of top-quality cable for under £10.

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.
ones, so try a demo first. You may also like KEF Q60s, but they're a lot different from the 104ABs you have, having a livelier and punchier sound.

NK

STICKING WITH VINYL

My system at present is an LP12/Lingo/Ekos/K9 with Trampolin, Creek 4140 S2 and Linn Index II speakers. I also have a Marantz CD50SE for a small, but growing CD collection. I will soon be in a position to substantially upgrade the system, and would appreciate your opinions. My thinking is as follows.

Since I have a reasonable vinyl collection and still prefer the sound of vinyl, I intend to build a top class system based around the LP12, and upgrade the CD player at a later stage. To give flexibility for future amplifier upgrades based on a digital front end, I feel it is best to go for separate phono/line/power stages, as pre-amps are concentrating more on line inputs, with few phono stages or none at all. The upgrade would then consist of a good MC cartridge, phono/line/power amps and speakers. The LP12 will have to go on a shelf, so advice on this would be useful as well.

The listening room is small (11 x 11), and I like a smooth, lucid sound with plenty of detail, especially on female vocals. The speakers will be either side of a chimney-breast, with acoloes about 12" deep behind them.

I've just about decided on a Lyra Lydian, although your comments on the Linn Klyde would be appreciated. Contenders for amplification are LFD MC1/LS2/PA2 and Michell Iso/Argo/stereo Alecto (standard versions with Hera power supplies).

I'm open to suggestions for speakers although I've been impressed by Linn Keilidh's in an all-Linn system. Are these sensible combinations, or do you have alternatives I should listen to for a similar outlay?

Andrew Lowry
Ipswich.

There's not so much we would suggest, since your choices seem sensible. The Lyra Lydian is a moving coil cartridge loved by all who hear it. Similarly, the Michell Iso/Argo and Stereo Alecto are amongst the best solid state amps available. Here though you should, if possible, listen to the new DPA amplifiers, the DSP200S and DPA200S, which are superb value.

If you like the Keilidh, use it as a comparative reference when judging other speakers. The one I'd suggest you try is the Heybrook Quartet.

FOOT TAPPER

I have recently upgraded my system, changing my NAD CD player and KEF 104/2's for an Arcam Delta 170.3 with QED digit and Postron and Quad ESL 63s.

The rest of my system consists of Quad 606 and QED passive pre amp with QED Incon Gold interconnects. QED digital interconnect and Furukawa speaker cable.

My room is 30' x 14' with carpeted solid floor, and is quite "hard" apart from heavy curtains across each end.

I am enjoying the much greater detail and separation that I can now hear on my favourite recordings, but I find that many familiar tunes no longer set my toe tapping as they used to. Also, I sometimes find the treble a little too strident.

I intend gradually upgrading my system with a new DAC and amplifier, pre-amp and sub-woofers, not necessarily in that order.

How should I go about restoring the tunefulness of the music without losing the new found detail?

My current shortlist for consideration consists of: Pink Triangle Da Capo or Audio Synthesis DSM Ultra Analogue, Michell Argo and Alecto and Gradient SW63s.

Bryan Ansell
Guernsey.

I have some strong reservations and some queries about your observations.

Firstly, going from KEF 104/2s to Quad ESL 63s is a major change and it sounds like you aren't really happy at the lack of impactful bass from the 63s, since foot tapping is usually associated with a well defined and clearly presented beat, an area where the 63s are weak. It has been said that bass drifts out from them - and I wouldn't disagree. Whilst we are all ardent Quad electrostatic fans (that is - Eric Brithwaite, Dominic Baker, Richard Kelly and myself, Noel Keywood), we love them for their insight, cohesive nature and sheer neutrality; box loudspeakers really are coloured in comparison.

What to do? Firstly, experiment with room positioning. Quads are dipole that radiate equally from front and rear and they react with a room in a manner that differs from monopoles (i.e. box speakers). Peter Walker, founder of Quad and their designer, always used to look for a long demo room at hi-fi shows, he once told me. The 'statics would be placed one-third to one-half the way up the side walls, using wall and floor to effectively increase baffle area and improve bass. Ideally, the rear radiation should be allowed to dissipate itself by travelling a long way to the rear wall, before being returned by reflection. Since wave energy falls off as an inverse square of distance, moving the speakers to a position at least 3-4ft in front of your rear wall can have a big effect. Richard Kelly has no shortage of bass from his original '57s and he places them like this in a long room similar to yours.

I use Celestion SL6000 sub-woofers, having designed my own crossovers to match them to the ESL63s. However, I have also used the REL active sub-woofer and can vouch for its effectiveness with the Quads; they form an astonishing combination together. The Gradients we don't know, but we have heard differing reports about their abilities. Again, room dependency may have

Continued on page 70

The Linn LP12, a good reason for sticking with vinyl.

The Quad ESL63s are a favourite amongst us at Hi-Fi
Continued from page 69

something to do with this, something the REL unit seems immune to.

I'm surprised that the treble should sound stunted. I can only assume that the Digit and Positron have something to do with it, since although the Digit on its own is very smooth and mild mannered, it gains zest with the Positron.

But zest isn't stridency. Try to be quite certain that you are not just hearing much more of the nastiness of CD as a medium through your new set up. If this is the case, then further improvement may only make matters worse, if you see what I mean! Also, make sure you are not trying to wring too much volume out of the 63s, since they'll only go so far and no further. I'd advise 12-15ft as a typical listening distance. If you are 20ft away in your long room, then you may be over driving them to get enough volume.

If you are at all tweaky and don't have inquisitive young children to worry about, then removing the protective louvre metal grills of the 63s (an easy task) will make a big improvement and will get rid of a slightly hard sounding metallic colouration from the upper mid-range. The electrodes have 2,500volts on them, so watch out!

Whilst the replacement items you list are superb in their own right and will work well with your system, I would hesitate to say that they could, alone, provide what you are seeking. More fundamental adjustments need to be made I suspect and, if you remain unhappy, then it may just be the case that the Quads, as wonderful as they are, don't suit your expectations and requirements and may well be need to be replaced. Even though we all happen to think they are incomparable in many areas, they are not everybody's cup of tea. NK

WEstrex Resurrection

I need your advice. My system is as follows; a Systemdek II X turntable with Akito arm/K5 cartridge, Marantz CD-42 compact disc player, Akai GX9511 cassette deck, Pioneer F-911 tuner and Rotel RC/RB 850 amplifier all mounted on heavy duty wall shelves. The speakers are Westrex and the listening room is 23' long by 13' wide with suspended wooden floor. The problem is, I'm not sure the system is performing as well as it might. You see the speakers have only recently been resurrected from many years of idleness; they were originally used with a Garrard 301 turntable, Quad 22 pre-amp and a pair of kit built valve monoblocks of unknown origin.

I remember the sound to be totally listener friendly, richly musical, involving and spine tinglingly emotive. These are the qualities that seem to be missing in the current set up, although vinyl fares much better than CD.

The speakers, now 30 years old, still appear to be performing well, though the wire wound tweeter rheostats, in spite of being cleaned, sometimes make intermittent contact, cured by giving them a brisk twiddle, or could this be a symptom of crossover problems?

Also an internal inspection revealed no soundproofing whatsoever. Could this have been by design? If not, what material would you recommend I install.

Also is there any specialist servicing available for these speakers? They are a 15 ohm impedance two-way design with 15" woofer vented at the top of the front baffle and a 4" metal dome tweeter. I have no handbook for them but have been told that they are rated at 30 watts. They are also large, extremely heavy and mounted on short dedicated stands.

Would a change of amplifier improve things? And as it's impractical to take the speakers to a dealer's listening room, it will have to be 'buy it and try it' - do you have any suggestions? My budget is around £600, but it might be more if the sound quality merits it.

The Garrard 301 is now mounted in a heavy teak plinth awaiting a new tone arm and cartridge, any suggestions here? Would it be better to re-think the entire system? And given a budget of £2000 where might it be most usefully spent?

Musical taste is mainly light classical and easy listening male and female vocals.

I would greatly appreciate your suggestions and comments.

John Davies

Saudi Arabia.

PS. The listening room is in my UK home which I use to the full when not at my working address here in Saudi Arabia.

You have a lot of interesting options available. The Systemdek IIIX and Akito are fine, but the K5 is not much appreciated in these regions.

It is too hard, bright, and edgy in its sound, even as budget cartridges go. We'd recommend a cartridge upgrade to a Goldring 1012GX or a 1022GX, both of which give a warmer and more amenable sound than the K5, whilst retaining detail.

But what about that 301?

Since Japan will pay a fortune for a good sample and the Japanese have already bought just about every good sample not consigned to skips by unknowing Brits, you can be assured it is worth careful attention. Contact Terry O'Sullivan of Loricraft (0488-72267), Peter Soper of Slate Audio (0525-38174) or Hayden Boardman of Audio Classics (0942-57525) for info on this classic. A Garrard 301 in good condition (they can be renovated) and mounted on a solid plinth (various new designs are now available) offers a superb performance. However, your current record deck is pretty good too, so don't throw that away instead! I suggest you get both running and choose the best.

I'm afraid you are unlikely to ever find that rich, warm sound again until you return to valves - and even then not all modern valve amps. possess such a sound.

Renovated Leak and Quad valve amplifiers are available...
POWER AND DETAIL
Your magazine has always been very good, but the DIY Supplement gave it reference status. I hope you will continue with it.

Concerning the twin power supply for the QED Digit, I would like to know whether its performance could be improved when using two accumulators (e.g. 12V batteries for motorbikes) instead of the two Positrons. If this were the case, then it could be a nice project to design a unit for automatic recharge.

I also would like some advice on my way to hi-fi nirvana. My system currently comprises a Marantz CD 80 CD player, Audio Synthesis passive pre-amp and two Moth 30 mono power amplifiers firing a pair of B&W Matrix 3 Series I speakers (6 years old). The binding posts of the speakers have been removed and the power amps are now directly connected to the crossover.

Interconnects between the power and power amp are Einstein cables and between the CD player and the preamp Monster Interlink CD. The speakers are spiked and the rest of the system rests on Sorbothane feet. Room size is 3.20 x 4.50m. The CD player has been tweaked with the result of smoothing its harsh treble. The sound of the system is really good, but I would like to hear more detail and make the presentation more powerful. I think I should add a DAC using the Marantz as a transport. My short list; QED Digit with twin power supply, Orelle CD 180, Pink Triangle Ordinal and Audiolab 8000 DAC. Later I would like to buy new speakers.

I would be very happy if you could show me some alternative ways of improving my system.

Dieter Strecker
Konrad Adenauer Platz,
Bonn.

Of course we will continue with the DIY Supplements. Our current plan is to continue producing one every other month, the only break in this schedule being for the Feb '94 issue which is written around Christmas time. There will be a two month gap here, Noel and I have to rest at some point!

It certainly would be possible to use batteries and in fact this, with care, is likely to produce even better results than two Positron power supplies. However, for simplicity, and to allow a clear upgrade path from the standard Digit, we chose not to do this. Maybe if there is enough interest we will provide a suitable circuit and charger for a battery power supply.

If you want more punch and drive from your system I would suggest going for either the QED digit with twin power supplies. However, for simplicity, and to allow a clear upgrade path from the standard Digit, we chose not to do this. Maybe if there is enough interest we will provide a suitable circuit and charger for a battery power supply.

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Malcolm Steward checks out some classic Sixties Soul and contemporary Texan Blues . . . whilst Giovanni Dadomo gets his hands on the long awaited new release from U2.

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NEIL YOUNG
Unplugged
REPRISE 9362-45310-2

Call me cynical but I'm not exactly sure why they've released this album. Perhaps I've not quite grasped the concept of the 'unplugged' series but I thought that the idea was that you took a performer who normally plays electric instruments, or who is usually backed by an electric band, and recorded them playing their electrically arranged songs with acoustic instruments. Wasn't Mr Young's last album, Harvest Moon, predominantly acoustic? Okay, there were electric instruments in the mix but it wasn't exactly a garage grunge album like Weld, now was it?

I've mentioned Harvest Moon because its closing track, Natural Beauty, was a live acoustic recording - just like 'Unplugged', and other tracks from it - Unknown Legend, From Hank To Hendrix, and Harvest Moon - all appear on 'Unplugged'. Can I be forgiven for thinking that this is starting to sound like the familiar Best of... formula, but with a slight twist?

Curious, isn't it, how record companies want to sell more product yet they've not twigged that compilations - of any description - aren't the way to do it. I would aver that you could only persuade fervent completists to duplicate material they already own by buying rehashes. Top prize for gall, however, must surely go to the exec who instigated the release of Arrested Development's Unplugged album - hell, they've only made one album!

Anyway, assuming that you're not a completist, you like Neil Young, and you don't have Harvest Moon, Unplugged could be seen as a worthwhile buy. I'm actually a sucker for his acoustic music - I even enjoy his wheezing harmonica playing and the fragility of his voice when it's not being bolstered by amplified accompaniments. I also have to admit thinking that he's a sublime songwriter and I particularly like his old material - songs such as The Old Laughing Lady, Long May You Run, and The Needle And The Damage Done, some of which date from the sixties.

I enjoyed this album, but suspect I might not have done had I paid for it.

RORY BLOCK
Best Blues and Originals
Volume 2
MUNICH RECORDS NETCD 0043

Disregard - temporarily - what I said about compilation albums elsewhere this month. There's a good reason why I'm preparing to do an about-face. Some artists' earlier material isn't as easy to get hold of as others and when that's the case I'll make exceptions to my don't-buy-

Malcolm Steward
Joe "Guitar" Hughes
Down & Depressed: Dangerous
Munich Records
(Through Topic in UK)
NETCD 0044

Just when you imagined that you couldn't find one more blues guitarist-singer who could really make you sit up and take notice, along comes another plucker with a style that marks him out as something special. My most recent finds have all been players from the mid-West but Joe "Guitar" Hughes comes from way down South in Houston, Texas. Perhaps it was the fresh- aired flavour of his playing that first made me sit up and listen when his CD whirred into action. Having lived on a diet of over-driven Strats and big, rich-sounding semi-solid 335s that typically walk out of the mid-West, it could have been the surprise of hearing his clean-as-a-whistle Les Paul tones. But I think it was more than that. I'm sure it was Joe's whole approach to the guitar and the animated, dance-floor bop of his backing players that really caught my attention. This outfit runs on economy of means serious business. Then listen to the dexterity and finesse with which he works her way through Robert Johnson's Kind Hearted Man, where you'll witness sensitivity and power meeting head-on. As a friend once remarked after hearing her play, I'd give both arms to be able to play guitar like that! Listen to this album and you'll better appreciate the kind of brain-addling artistry that prompts an intelligent person to issue a statement like that.

The Isley Brothers
Twist & Shout
Sundazed SC4002

Wearing my boring old fart hat, I'll admit that I've rarely enjoyed anything that has been proffered as soul music since the seventies disco boom took all the soul out of it. Sorry, but for me soul music is still Sam and Dave, Wilson Pickett, Otis Redding, Aretha Franklin and, of course, James Brown. Don't blame my views on nostalgia: I simply think of that era's music as real soul music because it had feeling. I knew how to hit you with a lick or riff and guitarists and drummers knew how to hit you with a lick or riff that smacked you squarely in the monkey bone. You can keep today's sequencers, keyboards - unless it's a Hammond B3 - and Digital Wind

The Isley Bros. twist & Shout!
They had soul. Real soul, not the cardboard cut-out, comes-on-a-microchip stuff.

Recordings from that era had soul too. They weren’t sanitised, super-slick, note-perfect, digitally noise-free confections; they were raw, rough and ready. They weren’t always musically perfect nor were they technically state-of-the-art, but they worked in spite of that. Recordings like this, sixties’ material from The Isleys, part of the Yesterdazed series from Sundazed Music Inc, are a great example. Listen to Twist and Shout before the Fab Four bleached all the colour out of it. Investigate Hold On Baby and hear where John Paul George’n’Ringo discovered those ascending harmonies. Or check out The Snake to hear an antecedent of the cool-man soul-jazz that scats out of the Yesterdazed series from sixties’ material from The lsleys, part of the stereos in countless upwardly mobile living rooms. If lovey-dovey soul is more your brand new bag, try The Barkays, Instruments. Give me The Barkays, Steve Cropper, The Famous Flames... They had soul. Real soul, not the cardboard cut-out, comes-on-a-microchip stuff.

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classic format it's shocking. There are two versions of 'Man-Size'. The first is a bizarre mixture of classical instrumentation (cello, violin - played by Harvey herself) that would give Frank Zappa nightmares, the second is a thundering rock interpretation, all sharp percussions and thundering bass and, of course, that wonderfully minimal, roaring beast that is PJ's guitar.

Is there anyone around to touch this woman and her band? Precious few. A must.

U2
Zooropa
CIDU 29 518 047 - 2

- In pop as in all art forms there are two kinds of classics. There are the critical and aesthetic milestones, namely 'Smiley Smile' by the Beach Boys; 'Exile On Main Street', 'Ziggy Stardust'. Love's 'Forever Changes', the first Velvet Underground album, 'The Stooges'; Sonic Youth's 'Daydream Nation', and such like. But far and beyond these so-called benchmarks appreciated by the critics or intelligentsia, there are what can only be described as events. Albums such as 'Sgt Pepper', 'Tubular Bells', 'Dark Side Of The Moon' or say 'Brothers In Arms'. These are popular on a global scale, not only for a brief period after their release but on a broad, almost incalculably lasting level.

It's U2's tragedy, as well as perhaps their crowning glory, that they achieved precisely that with 'The Joshua Tree'. It was, in short, the apotheosis of a progressively more glittering career, one which gave them platinum sales and a world wide audience. It took their attractively simple style - guitar, bass, drums, and Bono's uniquely emotive vocals - as far as this admirably restrained formula would allow.

Whether through boredom or the luxury such a vast popular and commercial success allows, U2's subsequent work, 'Achtung Baby', with its dearer clever Berlin based production c/o Daniel Lanois and Brian Eno, was a brave and often inspired attempt to break with the tried and tested formula of the rockin' U2 most of the planet had come to know and love.

Similarly with this latest effort - a three producer - Flood, Eno, Edge - affair, U2 spend most of their time trying their damnest not to sound like the group millions know. Hence the general title track with its satire and salvo against Euro adsppeak - Vorsprung durch Technik, Zanussi catchlines, and even the ancient Colgate 'ring of confidence' hype; all set to a dense blend of synth, mumbly vocal overlays and scathing wah-wah guitar courtesy of The Edge. U2 evidently don't rate the 'new' Europe - "...be a winner, eat to get slimmer". If that's not a Papist conceit then Ian Paisley is a Rabbi!

But overall this is U2 falling between two stools - pleasing themselves and catering to the converted - and sadly landing on neither one nor tither.
Bach at his most effervescent, Prokofiev at his most exuberant, Hindemith at his most elegiac, an ethereal setting of the Requiem from Renaissance Portugal and a rather more earthbound effort from one of Italy's greatest opera composers plus George Lloyd: eighty years young in June

JOHANN SEBASTIAN BACH
Organ Works - In dulci jubilo
Kevin Bowyer, Organ
NIMBUS NI 5289 (DDD/55.32)

● After lamenting the unimaginative programming of Martin Souter's Bach recital on Isis Records in last month's issue, it is heartening to report that the second volume of Kevin Bowyer's series for Nimbus is enticingly non-conservative in its choice of works. The recital is subtitled In dulci jubilo and the celebratory nature of this Christmas-tide sentiment is maintained throughout, and includes two chorale preludes on the old and, I'm sure, familiar theme of In dulci jubilo.

There is also a satisfying coherence and balance to the programme, which begins and ends with Bach at his most unbuttoned, in two exhilarating Preludes and Fugues. The concluding one, BWV532 in the 'brilliant' key of D major, is technically and sonically dazzling, a most effective rebuttal of those who believe Bach's music to be uneventfully placed. In contrast, the C Major Trio Sonata is more subtle, even saucy in its thematic ideas, while the fine

selection of organ preludes chosen by Kevin Bowyer show Bach exploring and illuminating the German Lutheran organ liturgy, including that most famous of Martin Luther's own melodies, Ein feste Burg ist unser Gott.

As in the first volume on Nimbus, Kevin Bowyer once again has the benefits of a fine and appropriate instrument, and a warmly responsive acoustic, the Marcussen organ of the Sct Hans Church in Odense, Denmark. The sound is clear and precise, yet also vibrant and atmospheric and Bowyer sounds as though he thoroughly enjoys making music in this venue. Technically, he is first rate, but more important is the empathy he shows for Bach, especially the high-spirited, even boisterous character that emerges through much of this music, music which is entertainingly introduced by Wilfrid Mellers in his accompanying notes. No complaints about lack of imagination here!

GAETANO DONIZETTI
Requiem
Viorica Cortez, contralto; Luciano Pavarotti, tenor; Renato Bruson, baritone; Paolo Washington, bass; Orchestra and Chorus Ente Lirico Arena di Verona; conductor, Gerhard Fackler
DECCA OVATION 425 043-2 (ADD/64.54)

● Like that other great Italian opera composer, Giuseppe Verdi, Donizetti also composed a setting of the Requiem Mass. And there, I'm afraid, the comparison ends. There are many fine moments in the work; some of which you feel must have impressed and influenced Verdi; and at times there are suggestions of the kind of sumptuous melodies which fill operas such as L'Elisir d'amore and Lucia di Lammermoor, but the invention is not sustained. In his defence, it has to be said that Donizetti, upon hearing of the untimely death of his compatriot and fellow composer, Vincenzo Bellini, merely wanted to write a simple lament in tribute.

It was his publisher, Ricordi, who persuaded him to expand this into a full-scale Requiem and then set a date in December 1835 for a memorial service to Bellini. The planning of the service was beset with problems and the Requiem - one of four settings that Donizetti made - was left incomplete (it lacks the Sanctus, Benedictus and Agnus Dei sequences).

The work was not performed at all during the composer's lifetime and it was 1870 before it was published, with the premiere coming that same year in Bergamo, where Donizetti had been a chorister. It has subsequently been revived to mark the centenaries of Donizetti's birth in 1897, and his death (1918), and its republication in the 1970s prompted this 1979 Decca recording in Verona, featuring - among others - Luciano Pavarotti. The mighty tenor makes the most of his big solo aria, Inergambs, with its 'weeping' motif on violins and cellos, but generally this is an uninspiring performance, not helped by an uneven recording balance. Donizetti's Requiem is monumental and often dramatically coloured, using effects such as tremolo strings and shifting harmonies to the full, but Verdi it ain't.

PAUL HINDEMITH
Symphony in E flat/ Nobilissima Visione suite/ Neues Vom Tage overture
BBC Philharmonic Orchestra; conductor, Yan Pascal Tortelier
CHANDOS CHAN 9060 (DDD/59.32)

● The more I discover of Paul Hindemith's music, the more I like. The E flat symphony of 1940 is a first-rate piece, eloquent in its expression, taut in its construction. It follows classical procedures in terms of form and development and the use of counterpoint is almost pure Baroque, but the dissonant harmonic language is wholly individual. Hindemith began the work after his exile to the United States and could well have been motivated by hearing the splendid sound of the Boston Symphony Orchestra while he was lecturing at Tanglewood. The first performance, however, was given by another American ensemble, the Minneapolis Symphony Orchestra, under Dmitri Mitropoulos.

Hindemith had fallen foul of the Nazis soon after the party had come to power.
Goebbels denounced his comic opera Neues vom Tage (News of the Day) as obscene. It was an example of Zeitoper (opera of the time) which set out to deal with contemporary issues, in this case one which has no less relevance now - the power of the gutter press. Here, Yan Pascal Tortelier offers the concert version of the overture, a dazzlingly energetic piece full of jazz-derived syncopations and with an irresistible rhythmic drive. It also illuminates Hindemith's neo-classical leanings with its crisp counterpoint, and frugal textures.

By 1938, Hindemith was finding life in Germany intolerable. He was a patriot, but he could not accept what was being done in the name of his country. Before departing for exile, first in Switzerland then the USA, he wrote a work which extols the humanist spirit, and true human values, the ballet Nobilessima Visione. The inspiration for the work were the frescos by Giotto depicting the life of St Francis of Assisi to be found in the Church of Santa Croce in Florence. The suite from the ballet, performed here, is full of quite wonderful and inspiring music, reminiscent in some ways of those gloriously affirming passages to be found in the symphonies of Carl Nielsen. And, like the other works here, it is compellingly played and directed with evident commitment by Tortelier. The spacious, full-blooded, yet detailed Chandos recording does full justice to the performances. A welcome and valuable addition to the catalogue.

**GEORGE LLOYD**

**Symphony No3 in F/Charade**

BBC Philharmonic Orchestra; conductor, George Lloyd

**ALBANY RECORDS TROY 990 (DDD/57.02)**

At one point in his career, George Lloyd was poised to consign the scores of his first three symphonies to the bonfire. Then he thought of all the renumbering of scores and orchestral parts he would have to undertake on his six later symphonies! The third Symphony to remain largely unaltered. it is an engaging enough work, but in terms of depth of expression and emotional impact, no match for, say, the powerful Fourth Symphony, arguably the finest of Lloyd's eleven symphonies.

Lloyd is at his best in the slower music, in the eloquent second subject of the opening movement, for example, a theme reminiscent of Rachmaninov and overflowing, as Lloyd describes it, "with minor key vigorous despair". An elegant slow movement is interrupted by a brass fanfare which introduces a lively, if not especially memorable finale.

The composer directed the first performance of this symphony in November 1935, with the BBC Symphony Orchestra and, here, it is another BBC ensemble - the Manchester-based Philharmonic - which supplies a spirited and enthusiastic performance. The Charade suite (a title presumably inspired by William Walton's Facade) is a sequence of scenes inspired by events characteristic of the 'sixties: student power, flying saucers, LSD, marches, popular music and the like. Unlike Walton's Facade, however, there are no words involved, Lloyd relying entirely on his consummate skill as an orchestrator to depict the imagery. It is all wonderfully tongue-in-cheek, with adept use of many musical devices. The mock-serious "academic" frugal writing of 'Student Power' is typical of its witty invention.

Neither work here is from the top drawer, which is a pity when this Albany issue coincides with George Lloyd's eightieth birthday (on June 28), but both are persuasively performed and well recorded in the BBC's Manchester studios. And the Charade scenes, as well as being good fun, are an orchestral tour-de-force.

**DUARTE LOBO**

**Requiem/ Missa Vox clamantis**

The Tallis Scholars; director, Peter Phillips

**GIMELL CDGIM 028 (DDD/65.48)**

The Portuguese composer, Duarte Lobo, was born around 1565 and died in Lisbon in 1646, dates which - as Peter Phillips points out in his booklet notes - place Lobo among those composers "on the cusp between a genuinely polyphonic Renaissance idiom and something based on harmonic movement reflecting Baroque thought". Duarte Lobo (not to be confused with the Spaniard, Alonso Lobo) became the most revered and widely performed Portuguese composer of his generation but, tragically, much of his music was destroyed in the Lisbon earthquake of 1755. One of his teachers was Manuel Mendes and it is quite possible that Mendes introduced Lobo to the setting of the Requiem by Tomas Luis de Victoria, which was published in 1605. If you are familiar with the Victoria Requiem, then echoes of its style will be heard in abundance in Lobo's beautiful setting for six voices. There is, however, a major difference. Lobo replaces Victoria's second soprano line with a second alto line (SAATTB) so producing a slightly darker, thicker sound. In spirit, too, the Lobo setting is akin to Victoria's, sharing its mood of tranquil repose, its air of celestial certainty. Simple, yet richly sonorous chords soar from the basic long-note plainchant; it is music of transcendent beauty, witness the exquisite Agnus Dei and the dissonances employed to great effect in the Graduale.

This setting of the Requiem, one of two made by Duarte Lobo (the other is for eight voices) was published in 1639. The same volume also saw the appearance of his Mass setting Vox Clamantis, a richly contrapuntal work displaying, like the Requiem, a good measure of originality. Both works find the Tallis Scholars in top form here, once again displaying the qualities of blend and tone for which they have become famous. This recording, made in the isolated church of St Peter and St Paul at Salie in Norfolk, also finds them at their most gloriously expressive. An essential addition to the collection for lovers of Renaissance polyphony.
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Would Radio History
The winter of 1945 and victory is at last within grasp in what the peoples of the Soviet Union know as the 'Great Patriotic War'. On January 13, the audience gathers in the Great Hall of the Moscow Conservatory to hear the first performance of Sergei Prokofiev's Fifth Symphony. What can it expect? An extravagant paean to the 'Great Leader' as Stalin and his apparatchiks would have wanted and probably expected? Or perhaps something that reflected the mood of those who had fought and suffered throughout the conflict.

The mood there was more one of pride tempered with relief, a despair at the cost of the war, in terms of lives lost and land destroyed, a simple desire for a return to normality, and a guarded optimism that victory might also bring change. This was the mood that Prokofiev reflected in his new symphony, a mixture of nobility, reflection and exuberance; much of the same qualities were also captured by Shostakovich in his even more light-headed Ninth Symphony. Stalin had been let down by his two greatest composers; for his 'hymn to victory' (his victory, that is), he had to look to the dull court musicians.

Although the Fifth Symphony is wonderfully scored, Prokofiev eschews the virtuosic side that characterises much of his music; there is also none of the irony and sarcasm that permeates many of his works. Yet the symphony is in no way humourless: for much of the time, it wears the broadest of smiles.

Prokofiev's response to the courage and endurance of his fellow Soviet citizens is made the more interesting because, in the 'twenties, he wanted no part in the cultural development of the post-revolution USSR. Eventually, however, this "enfant terrible" mellowed upon discovering how much his music was still appreciated in his homeland. He returned from exile as disillusioned with western ideals as he had been with those of the Bolsheviks.

Much of that time in exile was spent in Paris and, as with almost every other composer of the period, he came into contact with Diaghilev and his Ballets Russes, for whom Prokofiev's compatriot, Igor Stravinsky, had already written three memorable scores. Prokofiev approached Diaghilev with an idea for a ballet based on the legendary pre-Christian people, the Scythians. Diaghilev showed little interest in the idea, perhaps feeling it was merely repeating the pagan ritual embodied in the Rite of Spring. Prokofiev, however, was undeterred and welded the music into a concert suite. The dissonance of the music, its pounding, brutal rhythms, apparently so displeased some members of the orchestra that they gave up in disgust. The timpanist, though, seems to have thoroughly relished his all-important, high-profile role: he managed to break the drum skin in his enthusiasm.

SERGEI PROKOFIEV


City of Birmingham Symphony Orchestra; conductor, Simon Rattle

EMI CLASSICS 7 54577 2 (DDD/64.02)

First, a word of praise for the recording, which is of the highest standard. It was engineered by Mike Clements in the new (well, new-ish) Symphony Hall in Birmingham and is a model of balance and clarity, with natural perspectives and the kind of atmospheric but not over-cooked acoustic that makes for pleasurable listening. Indeed, the clarity is such that, for once, light floods into the more densely-scored sections of the Scythian Suite, revealing all the colour and detail that Prokofiev introduced into the orchestral texture. The playing in the Suite once again reveals what a polished outfit the CBSO has become under Simon Rattle, though his interpretation of what is, in places, quite barbaric music is a little on the tame side compared to, say, Abbado on DG who pulls no punches here.

In the Fifth Symphony, however, Rattle offers one of the finest performances currently on record. The first movement is beautifully shaped and paced, the build-up to its mighty climax perfectly handled, so as to seem the inexorable consequence of the preceding bars. The spring-heeled scherzo is similarly well-pointed: vigorous, but light and joyful.

At the heart of this Olympian work lies an adagio of brooding lyricism which, in its minor key central episode, rises to a climax of chilling anguish, embodied in searing harmonic clashes. Initially, Rattle seemed too deliberate, even ponderous in this movement but as the adagio takes shape, with its contrast of solemnity and serenity, so it becomes utterly compelling. The playing of the CBSO strings and woodwind is wholly admirable here.

As the Adagio subsides into peace, so the finale opens with recollections of the majestic first movement, but then a festive, carnival-like mood takes over and sweeps the music towards its rumbustious coda. Rattle captures all the jeu d'esprit embodied in this music and brings the symphony to a rousing and invigorating close.

Overall, therefore, a performance of many virtues and barely a single vice. It doesn't have the sheer excitement of Mariss Jansons' recording on Chandos, with the Leningrad Philharmonic (as was), but there you have to accept Jansons' view of the Adagio as more a kind of intermezzo than the deeply-felt, highly-charged movement it surely is. Neeme Järvi, also on Chandos, offers another persuasive account of the Fifth and the classic Karajan (DG) and Weller (Decca) accounts of 1969 and 1977 respectively still have much to offer. Given the quality of recording, though, and the desirability of the `fill-up', I suspect Rattle and the CBSO have just about edged into the top spot with this work.
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Hi-Fi World September 1993
Jan Garbarek's latest collaboration, a classic Bill Connors reissue and the late, great Hal Russell and his NRG ensemble all feature in this month's selection.

Simon Hopkins

ICE Under The Skin PATHOLOGICAL PATHOLOGY

After a regrettable absence of months, if not years, London's Pathological Records - the people who brought you gems from the likes of Swiss Free Jazzers 16/17 on the auspices of Patho prime-mover, vocalist and tenor saxophonist Kevin Connors reissue and the eponymously released Hal Russell's The Hal Russell Story ECM 1498.

In terms of music kicking around on the fringes of Industrial Rock this is a pretty stellar line-up, of course. But the music that makes up the nine songs of 'Under the Skin' far transcends any uninitiated supergroup piffle and, indeed, way outstrips the expectations of even these musicians' most fanatical devotees.

Starting with your basic extreme, bludgeoning drums-guitar-bass power trio, and working upwards, downwards and outwards, Ice bring the mixing-desk insanity of dub reggae, and Martin's free-jazz-as-noise aesthetic (Martin is by no means a 'technician' yet has the sheer force of a player who hears, indeed, feels the same power in the music of, say, Albert Ayler and PIL) into this psychotically disturbed music. Add to this layered, treated-beyond-recognition samples of classical and ethnic music. Simmer.

The result, which recalls, but in no way resembles, said Ayler and PIL, and Killing Joke and Jah Shaka and Pharoah Sanders and even - most especially on the disc's hypnotic, relentless closer 'The Swimmer' - Can, is as hard to pin down in terms of genre and influences as it is immediate in terms of visceral impact, but is nonetheless, if perversely, one of the finest Free Jazz group records I've heard this year. Excoriating, mesmerizing and utterly essential.

And no sooner promised than with you, more from Messrs Martin and Cochrane in the person of God. The group's third album to date, following on from 1991's live 'Loco' and last years acclaimed, and quite staggering major-label debut (and, alas, swansong) 'Possession', 'Consumed' returns to the live album, and in the absence of an inevitably superior new studio album, will do very nicely for now.

'Consumed' captures the band live in Switzerland last year, and with one of the band's finest line-ups to date (the term 'collective' applies to God as much in terms of their free-floating-line-up modus operandi as their songwriting); Martin on heavily special effects-treated tenor saxophone and vocals; former Henry Cow alto saxophonist (and for that matter, one of the finest creative musicians this country has produced in the last quarter-century) Tim Hodgkinson; Simon Picard on tenor; Niko Wenner of San Franciscoan hardcore-weirdness exponents Oxbow (for the record, creators of another fine Pathological release) on guitar - and slide guitar at that; John Edwards on double bass; Gary Jeff and Cochrane on bass guitars; and Scott Kell and Lou Ciccotelli on drums. The album features four long workouts - two new pieces and two old (albeit renamed) - and the new pieces in particular point to great things to come.

Now for those of you sadly unacquainted with the chops 'City Limits' described last year as this country's "most innovative band", use your imagination. Imagine the tribal onslaught of three bassists and two drummers; imagine Hodgkinson's and Picard's interlocked free improvising; imagine Martin's Wah-wahed, delayed, harmonized, squalling tenor inseparably caught up in Wenner's blistering guitar. And you still have no idea what this lot sound like. Utterly unique in Britain's musical landscape (and how many bands can you genuinely say that about these days), the target of ignorant, philistine rock press criticism as often as the recipients of the praise they earn in spades, and still, criminally, without a permanent recording contract, God remain the most important group on Europe's creative music scene. Buy this record. Buy the others if you haven't already done so. Luxuriate - albeit masochistically - in their sound. They are without parallel and ultimately superb.

THE HAL RUSSELL NRG ENSEMBLE The Hal Russell Story ECM 1498

When the fine German ECM label eponymously released Hal Russell's solo, multi tracked, composed-improvised marathon "Hal's Bells" last year, the irony that such a giant of Free Jazz was finally getting some richly deserved recognition just months after his death, was not lost on quite a few of us. For over twenty years, the saxophonist and multi-instrumentalist had been making some of the most creative new jazz music coming out of either Europe or America, and much of it at the helm of his group the NRG Ensemble. But Hal's story goes much further back than that. His career goes back...
to the fifties as a Gene Krupa and Buddy Rich-inspired swing drummer, and takes in, in his capacity as sideman, figures as diverse and as improbably as Miles Davis and Billie Holiday and John Coltrane. But the New Thing explosion in Free Jazz that came out of urban America in the 60s inspired Russell to take up saxophone, and then, just as almost Ornette Coleman took up violin to exorcise demons he couldn’t work out on an instrument he could play so well - and so easily - Russell took up whatever instrument he could lay his hands on and make a convincing racket with.

Such multi-instrumentalism isn’t just something he could put to use on a solo album like ‘Hal’s Bells’, it’s a way of making music that he utterly believed in and passed on to sundry members of the NRG ensemble. Thus, the NRG group on ‘The Hal Russell Story’, though only a quintet (Russell; Brian Samsdstrom; Kent Kessler; Steve Hunt; and the extraordinary guitarist-saxophonist Mars Williams) manages to play saxes, trumpets, drums, tuned percussion, flutes, didgeridoo, toy horns, bells, electric guitar, bass, double bass, trombone, vibes and on and on. With much ducking and diving, too. For not only do the band play this lot live, they record it without overdubs. Run boys, run! Halfway through the set, Russell asks: ‘What do you do when you know too much?’ and the lads shout out in unison: ‘Improve!’ You’ll look for a long way before you find a finer exhortation to pick up an instrument and do just that. He also creates - and this is an altogether more rarefied, even pastoral session. The album consists of nine pieces, all Vitous compositions - with the exception of the duet improvisations ‘Time Out! Parts 1 & 2’ - and the mood is definitely pretty sepulchral. In the past, Vitous has talked at length about the importance of letting sounds, just single notes, just hang in the air, and give off their full harmonic shape. And for much of ‘Atmos’ he’s content to do just that. He also creates - and this is all live no overdubs stuff - percussion effects by beating against the body of the double bass, often quite intricately. And, of course, around these rhythms and sonorous bass lines Garbarek hangs his usual, wondrous stuff, by turns gentle, fragile even, and scorching.

The ‘Time Out’ pieces change the mood a little, with Vitous triggering orchestral samples from a midi pick-up. A recent review frowned on this, but this writer thinks it’s the sort of touch that lightens proceedings a little - I personally could have lived with a bit more of this sort of experimenting; listening to a straight sax-and-bass session hard on the heels of the multi-instrumentalist orgy of ‘The Hal Russell Story’ was a bit of a shock. Over all, ‘Atmos’ doesn’t exactly extend either player’s repertoire much, if at all. Nonetheless, it is a bold statement, and given Garbarek’s tendency to sublimate his soloing to ensemble needs on his own records, it’s likely to be the biggest chunk of his playing you’ll come by for some time. And away from all the bravado of so many bassist-leaders, Vitous remains one of the most ingenious and frequently rhapsodic double bassists currently working in jazz. A rewarding listen.

**BILL CONNORS**

**Of Mist And Melting**

ECM 1120

- Fifteen years earlier, Garbarek was making altogether different music, and in altogether different company. ‘Of Mist and Melting’ is a mid-period ECM classic from 1978, and one long overdue for CD reissue. The session was led by American guitarist Bill Connors; a mercurial figure who’s gone from lyrical, extended-playing jazz sets like this to experimental, solo acoustic guitar settings, and then, in the mid 80s, metamorphosed into a hideous sub-Holdsworth fusion guitarist and swiftly disappeared without trace (I think). But his playing on ‘Mist’, and indeed, on the Garbarek group albums ‘Photo...’ and ‘Places’, is among some of the most beautiful I know.

Connors and Garbarek are joined by the stunning rhythm section of bassist Gary Peacock and drummer Jack De Johnette, making this a pretty definitive ECM line-up; if the record label has a sound - and despite label protestsations to the contrary, many contend that it does - then this group of virtuosic, thoughtful, ensemble-minded improvisers sum it up perfectly. A highly recommended CD reissue.
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Golden Dragon Power Tubes

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Please enquire of any tube types not listed.

A selection from our stock of over 2,500 different audio quality valves. Please enquire for items not listed.

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Hi-Fi World September 1993

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Balanced and specified carefully for long life and reliability, coupled with excellent sound quality, K5881 is sensitive enough to be used with a passive pre-amplifier or our own line-drive pre-amp, and it matches modern loudspeakers well. We've equipped it with the best choke-regulated power supplies, one per channel, plus heavy 4mm 'speaker' terminals that allow for bi-wiring.

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Because some of the drive units in this kit are difficult to source we are offering a drive unit pack, which contains 2x Tonigen Ribbon tweeters, 2x MW-114S midrange units, 2x MW107S Bass drivers, all crossover components, tag board and terminals. Price will be £420 inc p&p.
ACTIVE LOUDSPEAKER CROSSOVER
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- ZOOT SIMS QUINTET
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  - STEAMIN’ AND HORNS

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  - RELAXIN’ WITH MILES
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  - FEATURING SONNY ROLLINS

- THE MODERN JAZZ QUARTET

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The photograph on the left cannot do justice to the NEW NAIM NAIT amplifier and NAT 03 tuner we now have on demonstration.

NEW STYLE - Full width design with electronic switching for the NAIT and digital display for the NAT 03.

BETTER PERFORMANCE - The NAT 03 offers stunning FM at realistic price and the NAIT is now 30wpc.

MORE FEATURES - better facilities, the Nait offers 5 inputs with the option of a high quality phono stage.

GREATER FLEXIBILITY - the NAIT can be used as a preamp, a Hi Cap can also be added. Both units are size compatible with NAP 180 and 250.

JUST LISTEN! - come and listen to any of the NEW NAIM range in our comfortable listening rooms and we think you will agree, great products at an affordable price.
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SDA-I Digital To Analogue Converter
U.K. - Sugden's SDA-I bowled us over with a sound populated by masses of high-resolution details and complemented by very quiet, dark backgrounds and tremendous dynamics...

Canada - At a price well below many DACs of similar sound quality it offers real value for money in addition to its sonic refinement.

Germany - D/A converters from the Sugden stable have established themselves on a solid platform within the hi-fi scene.

SDT-I CD Player
Canada - The combination of excellent transport and high-quality parts make the Sugden a very relaxed and easy player to listen to, with no digital edge.

U.K. - I have to say Sugden's CD player just has to be near the top of any buyer's list.

A21a Class 'A' Amplifiers
U.K. - A true thoroughbred that will undoubtedly attract newcomers to Sugden's dedicated band of followers. It almost begs you to put on more music and then proceeds to play it with aplomb.

Holland - A concert hall in your living room. The reproduction quality of the amplifier is without any stress and gives total involvement in the music.

A25B Integrated Amplifier
U.K. - Not only does the little A25B look more refined than many of its peers, it also has a sophistication to its sound that is sadly lacking in most of its immediate competitors.

Singapore - The Sugden A25B will not fail to please in the way it presents the music. It is therefore, highly recommended.

Canada - The quality of sound produced by this amplifier is exemplary.

A48 Integrated Amplifier
U.S.A. - In terms of sound quality the A48 is a revelation. More than any other integrated amplifier in my experience. The Sugden imbues music with a warmth and body that is quite addictive.

U.K. - Coherent and musical, the Sugden A48B is on the warm side of neutral, well suited for those who like the valve sound.

Au5lc Pre-amplifier
Canada - You can tell that the Au5lc is special. Five minutes convinced everybody present that a pre-amp must sound like this if it is to be of reference quality.

Canada - Cold, out of its packing carton, the Sugden instantly sounded better than great. During the next few hours of operation, the unit literally blossomed and developed the sort of sound closely akin to a live performance.

Au5lp Power amplifier
Canada - We've never tested an amplifier which sounds this big and did its job so well.

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Alan Sircom - Hi-Fi World

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World Radio History
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Mighty Miniature

Simon Cooke listens to Richard Allan's new Minette II loudspeakers, budget battlers he took a liking to.

The £20 bracket is a competitive area of the market and a speaker has to offer something quite extraordinary to gain any laurels. These new budget speakers from Richard Allan are priced to compete with the Mission 760is and Tannoy 603s of this world.

The Richard Allan Minette IIs are slightly too tall to fit between bookshelves, so they'll run the risk of being crammed sideways between the volumes, a position in which they will probably perform worse than other small speakers such as the Goodmans Maxim 3. All the same, compact budget speakers such as these have certain inherent advantages.

As well as being inconspicuous, the proximity of the two drive units to each other represents a near point source, and so gives a coherent and well focused presentation. The speaker cabinets are adequately finished, giving an impression of having had the money spent on the internal workings, rather than simple shoddy workmanship. The front baffle houses the drive units; the rear panel the reflex port set almost centrally and two respectable looking binding posts. The speakers came with cloth grilles, which I removed out of habit, before wiring them up.

Being of a sadistic nature, I ran the speakers in for the minimum time and then threw them a few curved balls. I was surprised to find how well they coped. These speakers could crack along at an impressive rate, and remained cool through some alarmingly complex drumwork. Tight bass appeared to be their trade mark, highlighting the wooly nature...
of the B&W Vision DSI's which are usually used on this system. The B&W's however, had the edge on bass extension. Deep, rumbling bass lines are simply not in the Minette repertoire, even if you place them a few inches from a solid wall, where you will gain bass extension at the expense of just about everything else. I kept them on stands about 12in away from the wall, where they would give a good punchy track, like Seal's Killer, everything it deserved. The speed slackens slightly as the volume rises, but these are not speakers to worry your neighbours with, and even at their slackest, they will still impress with their responsiveness.

The Richard Allans display a nice midrange, offering a well rounded tone without losing focus. However, if positioned too close to the junction of a partition and a solid wall, or any acoustic hazard, the mid-band stays with the speaker, rising to the lower treble range, where the notes suddenly leap away from the box.

Being something of a subjective reviewer, I could not honestly say whether this was due to a suck out or not, but a sharp change in frequency response seems to be the only answer, by suddenly kicking out a large increase in energy, enough to set up resonances. Away from such acoustic booby-traps, this foible passes without notice in any normal usage.

Up among the treble notes is where you will find most of the problems with this design. Generally, these speakers handle transients quite well, but anything more sustained is thin and sinewy, quickly becoming tiresome on sustained listening. This had another effect on the positioning of instruments; cymbals tended to stay with the drums, spatially, but steel strings and violins had a tendency to shift in and out of the boxes, muddying images. When taken together, the overall tone end of a DPA DAC and pre/power combo. This experience led me to think that I had been unjust in pairing these speakers with the reference system, although they had the benefit of the requisite amount of bass drive there. Because of their response with the reference system, I can't honestly say that these speakers give an "out of box" effect. They can be driven that way, but are unable to soar of their own accord.

If you consider buying these speakers, you must account for stands, since the proximity of a wall causes the sound to become confused and lose tempo. The sound which they transmit is enjoyable and euphonious on first hearing, but beware of positioning and partnering them, because their few failures can make them tiresome to listen to in the long term. They should be adequate to the task of partnering most equipment, but care in this respect could well pay dividends in performance quality.

The new Minettes can sound exceptional; Richard Allan may just have a winner on their hands. But there are so many good rivals out there, which fail to be recognised because only the truly exceptional is remembered, that I would not like to bet on it.]

Richard Allan Minette II  - £120
Richard Allan Audio Ltd.,
Bradford Road,
Cleckheaton,
W. YORKS BD19 4AZ.
Tel: 0274-872442

MEASURED PERFORMANCE

The Richard Allan Minette IIIs are the latest to join the fiercely competitive sub-£150 budget box loudspeaker market. Setting the standard are the Goodmans Maxmums, Mission 760Is and Celestion 1s, to name but a few, so the competition is strong. Sporting a small paper woofer and a plastic tweeter they don't look quite as high tech as their competitors, but the real test is whether they perform sonically.

As far as measurement goes the Richard Allans are a bit of a mixed bag. Their response is quite even, with a slight treble lift which should produce an open and clear sound. There is quite a strong suck-out where the woofers cross over and in this respect the speakers could have been better engineered. Overlapping the woofer and tweeter a little more accurately would have summed their roll offs, filling this hole. As it is, the loss of information will compromise detailing to a small extent; such suck outs can result in a euphonic softness, quite liked by some.

There's a small lift up in bass output to 125Hz, but below this frequency output falls off rapidly, so there's little low bass from the Minette (-6dB at 80Hz), as is to be expected from such a small cabinet.

Like most budget miniatures the Minettes are not especially sensitive, producing an average 86dB at 1m for 2.84V of pink noise. However, their overall impedance is high at 11.8Ω so they will not demand high current from an amplifier and this is the reason for mediocre voltage sensitivity. A modern, budget, solid state integrated amplifier should have no problem driving them to high levels within a moderately sized room. DB

"Up among the treble notes is where you will find most of the problems with this design"

Richard Allan Minette II - £120
Richard Allan Audio Ltd.,
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Frequency Response

![Frequency Response Graph]

The Minette IIIs have an even response, except for a dip at the crossover

Impedance

![Impedance Graph]

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WHY A HI-FI TUNER NEEDS A GOOD AERIAL

For best sound quality, a hi-fi tuner must have a strong signal of around 1mV minimum.

The question is: how do you get it?

INDOOR AERIALS
Simple pin-up wire types (dipoles) only provide enough signal within a few miles of a transmitter. Otherwise they are noisy and prone to receiving multipath signals that produce distortion.

We've tested powered indoor aerials and expensive hi-tech designs costing up to £50 and find they give no more signal than simple, horizontal dipoles, either of the wire type or of rigid aluminium. Their only benefit is smaller size. It is better to buy a rigid aluminium dipole and mount it high, upstairs on a wardrobe, at the top of a stairwell, or similar.

LOFT AERIALS
Loft aerials have the advantage of height and, if there are many elements, gain as well, so they provide a stronger signal than a simple dipole indoor aerial. In areas of reasonably high signal strength - which usually means within ten miles or so from a transmitter, a loft aerial may be satisfactory.

Usually with three elements, a director rod (short), reflector rod (long) and dipole element in between, loft aerials are also directional; they must be pointed toward the transmitter. They reject interference and reflected signals better than dipoles, giving a cleaner signal to the tuner.

The best mounting position is high up in the V of the roof, away from metal objects like water tanks. A long downlead will be needed, preferably of good quality to minimise signal loss.

BALCONY & WALL MOUNTING AERIALS
Balconies in blocks of flats have the advantage of height, giving a much stronger signal. However, the balcony should face the transmitter for good results.

It is often possible, if a little difficult, to wall-mount an aerial on a stub mast outside a window, but you may need consent to do so. Hanging out of a window can be dangerous, so consider using a professional installer. And make sure the wall faces toward the transmitter of course.

OUTDOOR AERIALS
In most locations, only an outdoor aerial will give a signal strong enough and clean enough (i.e. free from interference and multipath reflections) to provide true hi-fidelity from a good tuner. Benefits are height (the higher the better), crucial for obtaining a strong signal free of reflections, and number of elements, which determine both gain and directionality.

Multi-element aerials are used in areas of medium to weak signal strength, meaning up to around forty miles from a transmitter. Any further away is judged as a 'fringe' area and will demand even more elements.

MULTI-ELEMENT AERIALS

ATTENUATORS
When it's necessary to use a directional aerial to cut down reflections from tower blocks, but the aerial then gives too much signal (i.e. more than 10mV), an in-line attenuator can be used to prevent tuner overload.

AERIAL INSTALLERS
The best and overriding reason for using an installer is personal safety; roof work is very dangerous. Installers are also very quick and well equipped; DIY may take the large part of a day. Local installers should know about area-specific problems, the location of repeat and fill-in transmitters, and such like - all matters that are likely to be a mystery to most people.

Finally, good installers should have a Field Strength Meter that not only enables them to see whether an aerial is giving the required result, but can prove this to the satisfaction of the customer. Around 1mV is wanted, meaning powerful stations will come in higher (say 3-5mV) but weak ones a bit lower (0.3-1mV). If for no other reason, knowing that the aerial works properly is enough reason for using an installer.

Discuss this matter with them first though. In some areas, it may be impossible to obtain such a strong signal, no matter what aerial is used; get a variety of opinions if necessary.

CONFEDERATION OF AERIAL INDUSTRIES
The CAI has a countrywide list of aerial installers who are members that abide by the rules below.

To find a local service, contact -

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<table>
<thead>
<tr>
<th>Speaker</th>
<th>Amp</th>
<th>CD Player</th>
<th>Price</th>
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<tr>
<td>PZM-1000</td>
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CREEK CD60 £500
QUAD 67 £790
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Superb starter CD Player, packed with facilities.
Exciting and forceful sounding player, but slightly characterful.
16-bit player. Excellent rhythmic properties and a superb bass performance.
A new breed of Quad. Remarkable solidity and lacking nothing in verve or excitement.
Airy and spacious with a rare quality of ambience.
Single box, 16 bit player. Close to the two box CDS, has vital 'tingle factor'.

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£270 Exciting and forceful sounding player, but slightly characterful
£500 16-bit player. Excellent rhythmic properties and a superb bass performance.
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DPA DIGITAL T-1 £795
M'MEGA DUO CD2 £1850

Superbly clean and detailed sounding transport when sync-locked to DPA's converters.
Seriously priced, serious CD using Philips' CDM-9 PRO mechanism. Exemplary.

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QED DIGIT/OPTO £39/169
DPA LITTLE BIT II £450
DPA DACS £450-2K
SUGDEN SDA-1 £650
P. T. ORDINAL £695
M'MEGA DUO PRO £1050
DPA PDM ONE III £1280
P. T. DA CAPO £1350

£39/169 Philips Bitstream. Excellent value, with no rough edges. Now with optical input (Opto).
£450 Building on the qualities of the original Little Bit, the 'II' is clear and open.
£450-2K The current masters of DAC-7, their DACs offer superb performance at a range of prices.
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ROKSAN XERXES £785
P. T. ANNIVERSARY £1200
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ORTOFON MC15 £100
GOLDRING 1042 £100
SHURE VST-V £150
GOLDRING ELITE £200
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£60 Rounded bass, slightly forward midband, clean transients. A bargain.
£80 Extra degree of dynamic range and speed over the 1012GX.
£100 The blue point casts a romantic charm over all types of music. Robust too.
£100 Moving coil cartridge at a moving magnet price. Has a tight grip on rhythm.
£100 A reference to all other MMs regardless of price.
£150 One of the finest moving coils currently available. Excellent tracker.
£200 British made moving coil. Good value, smooth and detailed, but can sound brittle at times.
£500 Scan-Tech designed moving coil cartridge. Musical and accurate, without any flaw.

CASSETTE RECORDERS

NAKAMICHI DR2 £500
PIONEER D-500 £600
TEAC V8000S £699

£500 Worth every penny, pushes recordings to the limit and remains unflustered.
£600 Very smooth sounding DAT deck, but still slightly coarser than the original source.
£699 Dolby 'S' deck. Easy to use, very stable sound, with instrumental textures close to perfect.

NAKAMICHI DR1 £780
NAKAMICHI CR-7 £1500

£780 'Domestic' deck with Nakamichi sound quality, and manual head azimuth adjustment
£1500 No Dolby 'S', but auto tape tuning and motorised head. Astonishing complexity, The Best!

Worth every penny, pushes recordings to the limit and remains unflustered.
Very smooth sounding DAT deck, but still slightly coarser than the original source.
Dolby 'S' deck. Easy to use, very stable sound, with instrumental textures close to perfect.

'Domestic' deck with Nakamichi sound quality, and manual head azimuth adjustment.
No Dolby 'S', but auto tape tuning and motorised head. Astonishing complexity.

The Best!
Wortd favourites

TUNERS

AURA TU-50 £230
YAMAHA TX-950 £260
HK TU9400 £300
QUAD 565 £490
NAIM NAT 03 £500
NAIM NAT 01 £1377

Superb FM-only tuner. Produces a delightful, three-dimensional sound. A cracker.

Fine all-rounder, with good AM section.

Fairly basic facilities, but sound which beats anything at the price.

Among the very best in terms of tonal colour and imagery. Remote controllable.

Warm and easy sound with a good sense of atmosphere. Excellent value.

The best solid state tuner currently available. If you want better radio, live in the studio!

INTEGRATED AMPLIFIERS

HK HK6150 £159
NAD 302 £160
PIONEER A-300X £200
DENON PMA-3500 £220
HK HK6550 £349
AUDIOLA 8000A £430
AUDIONOTE OTO £1250
EAR 834 £1295

Good sounding starter amplifier. Great dynamic range, excellent bass.

Lots of insight and detail, but could sound a little rough in the wrong system.

Exceptionally sweet mid and treble, plus the superb dynamic range of the A400.

Powerful and with deep rhythmic bass drive.

Thoroughly refreshing, tonally neutral amplifier with a realistic price tag.

Very neutral and superbly built. Good bass, great imagery, but can be sterile.

12w Valve amplifier. More in tune with music than hi-fi. Superb dynamic range.

Valve integrated amplifier with a sweet, open and detailed sound.

PRE-AMPLIFIERS

A. I. SERIES 200 £350
A. SYNTH. PASSION £475
DPA DSP 205S £495
MICHELL ISO HR £850

Valve preamplifier. Rather coloured but very dynamic. Best with Innovations equipment.

£475Or £275 for the kit version. Unrivalled transparency from a passive pre-amp.

Not quite the 50S, but there’s still nothing to match it at the price, use with 200S power.

Impossible not to recommend. What more does your vinyl want?

POWER AMPLIFIERS

SUGDEN AU 41 £530
QUAD 606 £675
DPA DPA 2005 £750
MICHELL ALECTO(S) £1300
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140W powerhouse. Smooth and civilized, with the legendary Quad back-up.

Not as cold as the 50S. Better than anything else at the price.

Valve like transparency, big warm easy going sound.

So far the most correct speaker we have discovered at the price. Sweet and even natured.

A rich and smooth blend that offer their best when bi-wired.

Single-ended valve design. Noel is still suffering withdrawal from this product.

LOUDSPEAKERS

CELESTION I £99
R’ ALLAN MINNETEI £120
GLL MAXIM £120
MISSION 760i £120
TANNOY 603 £125
ROGERS LS2A £209

Low price, compact size, big sound. An exciting all round performer.

Fast and lively sounding, competent bass.

Replacing the Maxim 3; not as tight in the bass but still one of the best at the price.

Detailed, fast, and have bags of rhythm. Ear bashing pleasure.

A nich and smooth blend that offer their best when bi-wired.

So far the most correct speaker we have discovered at the price. Sweet and even natured.

Highly efficient small-box loudspeaker with a superb mid band. Great for valve amps.

There probably isn’t a more neutral sounding design anywhere near the price.

Sensitive enough to work with low power valve amps. Fast and detailed sound.

Metal driver ’speaker with an exciting and lively presentation.

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Mono, self-powered subwoofer that works! Very flat frequency response.

Small box design. Can convey the spirit, drive, and passion of music in a small room.

Hybrid ribbon design. Great imaging and detail. Good value for panel fans.

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Giant loudspeakers. Capable of awesome sound. Need good valve amplification.

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Musiflex cable is well known throughout the Professional Music Industry for its neutral transparent sound.

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Jack-Jack | 1m. | £8.00
Jack-Jack | 0.5m. | £7.50
Jack-Jack patch lead | | £8.00

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Scart-Phono quad | 1m £26.00
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Scart-Phono pair | 1m £16.00
SILVER QUALITY
Neutrik ProFi Connectors, Sharkwire.

**Description** | **Length** | **Price**
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XLR-XLR | 1m | £8.50
Scart-Phono pair | 1m | £16.00
Scart-Phono quad | 1m | £16.00

Please add £1.00 per extra m. single
Please add £2.00 per extra m. pair
Please add £4.00 per extra m. quad

**SILVER QUALITY**
Neutrik ProFi Connectors, Sharkwire.

**Description** | **Length** | **Price**
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Scart-Phono pair | 25m. now £35.00
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Neutrik ProFi Connectors, Sharkwire.

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Scart-Phono pair | 25m. now £35.00

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(What Hi-Fi?, December 1992)

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NAIM NAP 250/ HI CAPI/ NAC62. All as new and boxed. Current list price £2400, accept £1350 ono. Tel 081 954 4858 (Harrow)

GARRARD 401 transcription turntable and SME 3009 (II) arm mounted in heavy SME 2000 plinth- the last one made. £250. Magneplanar SMG panel speakers, £220. Tel 0273 684 424

LEAK STEREO TROUGHLINE, £85. Linn LK1 pre-amp, £150. Ortofon T5 mc Steep up, £20. Sugden A48 mkII amp, £90. All very good condition. Wanted Grado cartridge F1/ F1, + any condition. Tel 0209 820 066

MARANTZ CD725E CD player, as new. List price £550, will accept £350. Tel Chris 0202 475 781 (B' mouth area)

LEAK STEREO 401, SME plinth and 12" arm, Shure pick up, £150. Heybrook HB1s, £79. Revolver, L.V.X., Shure, £79. Decca revised, rewired unipivot (new) £59. Croft Super Micro, £169. Tel Paul 0895 446 713

ACCESSORY CLEAROUT: Audio Synthesis Silverblue cables, half price: £50/m pair terminated, £20/m pair unterminated, various lengths. Van Den Hul D-102 Ill, 1m pair, £40. Deltec Slink, 1m pair, £20. Kimber 4TC, 1.5m pair, £40. MIT Zap 3.7m pair, £45. Mana Acoustics Soundtable, £125. Tel 081 6751733 (Eves/weekends)

DELTEC EQUIPMENT: DSP50s pre-amp + uprated power supply and DPAS0s power amp £999 (£2200). T1 CD Transport, 6 months old, £599. PDM1 mk II DAC, 9 months old, £795 (£1280). Acoustic Energy AE2A speakers, rosewood, inc AE 1 speaker stands. All items in mint condition, boxed with all fittings, £40. Tel 0525 384 174 (After 6pm)

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LEAK STEREO TROUGHLINE, £250. Linn LP12 VALHALLA, Basic speaker switch, £20. Tel 0602 753 087 (eves and weekends)

MUSICAL DESIGN D1401 high current 170 w amplifier, 100,000mfd capacitor. Cost £1595, accept £675. Matching groove tubed line stage SP-1, cost £1295, accept £395. Excellent sound, £295. Tel Tony on 0457 820 470

MUSICAL FIDELITY PI70/ PI72 pre and power amps, £500 ono. Marantz CD7411SE CD player, £150; or £600 the lot. Tel 0293 511 334 (Crawley)

REVOX G36 VALVE tape recorder converted to 7 1/2, and 15 I.P.S. operation. Very good condition, £600. Tel Geoff 0602 753 087 (eves)

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The Sound of Silence.

Crossstalk, noise interference, signal degradation. All dirty words as far as we're concerned. That's why the JVC AX-A662BK amplifier has no such vices. Featuring separate heat sinks and 'Advanced Super A' circuitry for left and right channels coupled with the dramatic reduction of internal wiring, this amplifier is virtually free of such problems.

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