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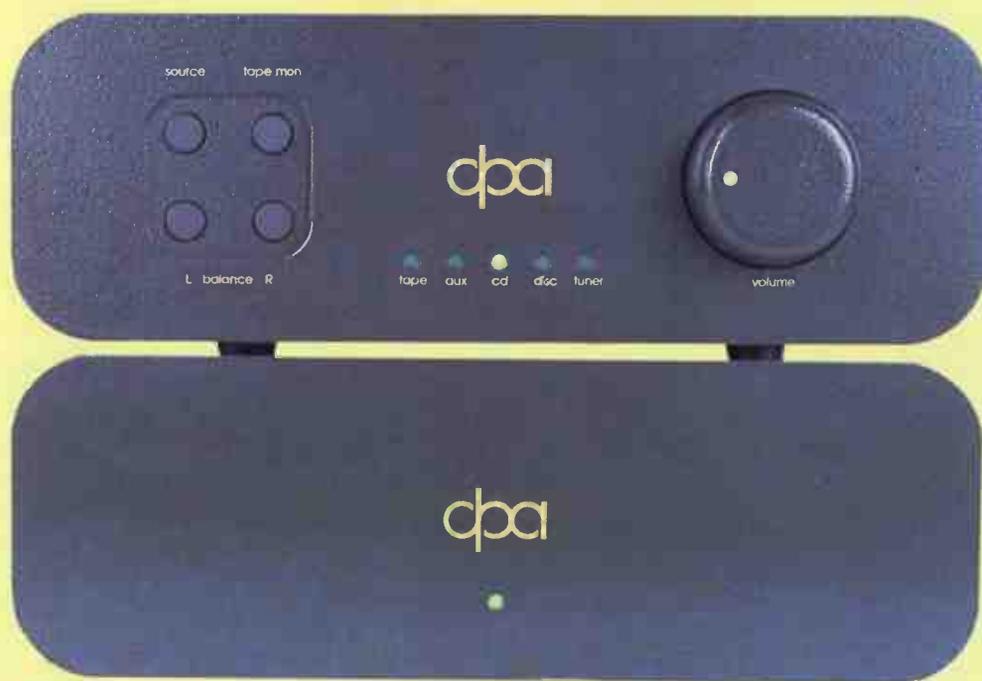
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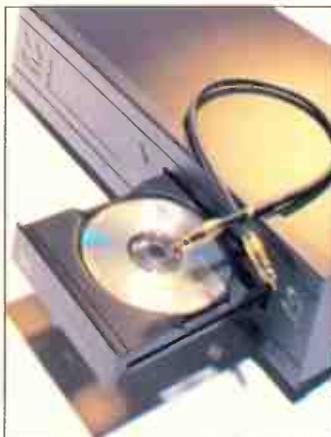
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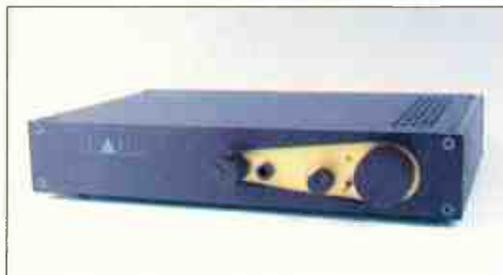
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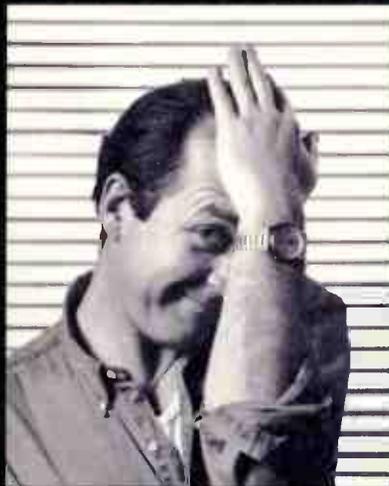
After receiving a storming review from fellow Yorkshire man, Eric Braithwaite, we're offering, not one, but THREE Sugden A21a amps in this month's competition. **74**



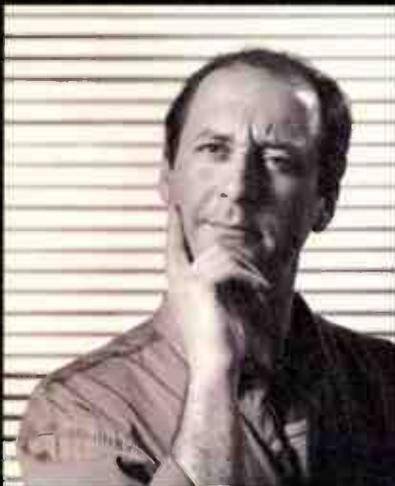
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"I've got a pretty good hi-fi system"



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"Sure I'd like a Naim CD player"



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111, Tel: 371 500 0000
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110 Middle Street, Taunton, Somerset. Tel: 0638 793961

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Lyric Hi-Fi
84 Bridge St, Portlaoine, Co. Armagh. Tel: 0762 358059

MICROMEGA TAKE CENTRE STAGE

Micromega are soon to launch a modular CD player to replace the Logic and Leader models. It is based around a Philips CDM12.4 transport, but this is the only part of the machine not to be made in-house. Three models are available: the Stage 1, 2 and 3 at prices of £449.99, £599.99 and £799.99 respectively. Models 1 and 2 can be upgraded to the 3's spec. All the digital circuitry is placed on a dedicated board, thereby allowing upgrading through simple removal and replacement.

Micromega D.A. Ltd. P.O.Box 13. London E18 1EG. Tel: 081 989 0692



PRETTY NEAT

Following the success of the Petite, Neat Acoustics have followed up with the more affordable Critique loudspeaker. For £335 you get a custom made 160mm bass unit, a 28mm Morel fabric dome tweeter and a small reflex loaded cabinet. The tweeters are 'handed' to improve image detail.

Neat Acoustics, 62 High Northgate, Darlington, County Durham. DL1 1UW. Tel: 0325 460812



ORELLE AMPS

Following on from their recent success with CD players, Orelle have produced a new pre/power-amp combination.

The SC-200 pre-amplifier is a minimalist design priced at £399.00. The SP-150 power-amplifier offers 75watts per channel for £499.00.

Orelle Hi-Fi. Unit 11, I-Mex House, 6 Wadsworth Road, Perivale, Middlesex, UB6 7JD, England. Tel: 081-810 9388, 081-991 5591.



SCALING NEW HEIGHTS.

There's a new tower on the block – the Studio 200.

And it's going to make you think again about how much loudspeaker you should get for your money.

Innovative cabinet construction, critical driver offset placement and state-of-the-art componentry combine to bring you a new sophistication in high-end listening experience.

The Studio 200 can now be auditioned at selected dealers. Contact us for details.

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BOREHAMWOOD
HERTS WD6 5BA
TEL: 081-207-1150
FAX: 081-953-8933

DCC NOW DOWN TO UNDER £250

Philips have reduced the cost of DCC ownership once again. The midi-width DCC300 has been reduced to £249. A full size DCC600 can be had for £299, and the top of the range DCC900 is now down £200 to £349.

Philips are also doing a promotion on the portable DCC130. Buy any DCC system and pick up a portable for £99.99.

Philips Consumer Electronics Ltd.,
City House, 420-430 London Road,
Croydon, Surrey CR9 3QR. Tel: 081
689 2166

ROK BOX

Roksan have just announced the launch of a new loudspeaker, only the third the company has ever made. Called the OJAN 3, it uses a



decoupled baffle for the tweeter which is said to remove any potentially disturbing vibrations. It is a large floorstander, with the bass unit strangely mounted above the tweeter on a slanted baffle. This is said to geometrically align the drive units, although the baffle puts the tweeter ahead of the acoustic centre of the bass unit.

GREEN METAL

Perfect Pitch Music have decided to manufacture their Light Metal loudspeakers, so named because of the metal drivers used, from 'green' wood, that is, wood from sustained forests. The cabinets are made to order by British furniture designer John Paul Jacques and any finish can be supplied as long as it's 'Green'.

Developed using a panel of musicians to give a neutral tonal balance, the Light Metals are available for £2600 a pair. Early in the new year there will be an active version and a 'digital drive' version will follow in the summer.

Perfect Pitch
Music, Hanworth
Trading Est,
Hampton Road
West, Hanworth,
Middlesex. TW13
3DH. Tel: 081 893
8662

BRISTOL HI-FI SHOW (SOUND & VISION '94)

This year's Bristol hi-fi show will take place on the 18th, 19th and 20th of February at the Ramada Hotel. Of course, we'll be there with a wide range of accessories and World Audio Design kits on display.



Priced at £895 it should be available as you read this.

After nearly nine years in production, the Roksan Xerxes turntable is finally to be discontinued. Vinyl lovers need not despair, though, as they are continuing with the TMS and Radius decks.

Also for the chop are the ROK-DPI Compact Disc transport, and ROK-DA1 DAC. The latter has just been replaced by the new Atessa ATT-DA2 DAC, whilst the DPI replacement will be available in spring.

Roksan, Stockley Close, Stockley Road, West Drayton,
Middlesex. UB7 9BB. Tel: 0895 436385



GENERAL ELECTRIC Co. G.E. RETURNS

Back in electrical shops after a very long absence are the distinctive yellow and blue boxes of General Electric U.S.A. (not to be confused with British GEC). And surprise, surprise, the company is reappearing right back in its original business - light bulbs! As our picture shows, GE's modern light bulb carton looks very much like the one used to cosset 211 valves in 1947.

It was from light bulbs that the first valves were derived by Lee de Forest in 1905 and by 1919 General Electric started manufacture of the massive 100watt anode dissipation 211 valve, used in radios and amplifiers right up to the end of World War 2.

The 211 valve has a carbon anode which can be seen in the photo. Inside lies a vertical spiral of wire that acts as a grid, and inside that the bright-emitter heater wires that glow a soft orange. These are similar to the coiled filament of a light bulb, but they run at a lower temperature, giving out less light. On the glass envelope lies the GE logo, identical to that on their 1994 light bulb. I wonder if we could persuade them to start putting grids and anodes back into their light bulbs?

GENERAL ELECTRIC
Tel: 081-741-9911



GLASSY GARRARD

The comeback made by Garrard 301 and 401 models is further enhanced this month by the introduction of a glass platter mat. The intention is to damp ringing colourations from the Garrard's massive cast platter. It also acts as a hard, unyielding surface to the record, to provide maximum information retrieval.

Slate Audio, 47 Gemini Close, Leighton Buzzard, BEDS. LU7 8UD, Tel: 0525 384174.

SPARES FOR REVOLVER

Don't worry, if you are the owner of a Revolver turntable and need spares. Although the company are now in liquidation, spares will continue to be available from Alison Acoustics at their new address:

Alison Acoustics, 20 Cleveland Way, Shelly, Huddersfield. HD8 8NQ. Tel: 0484 603333

DAC-IN-THE-BOX

From the makers of the rather clumsily named DDE v1.0, Audio Alchemy have brought out a new budget digital CD convertor priced at £199.95. The DAC-in-the-Box features a Crystal 8412 input receiver, Yamaha 3434 Digital Filter and Twin Analog Device's 1860s. An external power supply is also included.

Also new from Audio Alchemy is the DDS II transport. Unlike their previous transport, the DDS II is a front loading

machine. Apparently, much work has been done on damping the laser assembly and chassis, and obtaining correct servo timing. Price: £795.00.

PATH PREMIER, Unit 2, Desborough Ind. Park, Desborough Park Road, High Wycombe, Bucks. HP12 3BG. Tel: 0494 441736.

NAD DROP MASH

In their latest model, the NAD 501 CD player, NAD have switched from using a Technics based MASH digital processor and transport, to Philips sourced components. The 501 is priced at £179.95.

NAD Marketing Ltd. Adastral House, 401-405 Nether Street, London N3 1QG. Tel: 081-343 3240.

HISTORY OF VAVLES

A conference on "The History of Thermionic Devices" will be held at the Science Museum Annex, on 23rd April 1994. The £30 conference fee includes seven talks, a special exhibition arranged by the Science Museum, a listing of proceedings, and lunch.

Keith Thrower, Old Cedar, 12Wychcotes, Caversham, Reading RG4 7DA. Tel: 0734 74813.

ROTEL *hi-fi*



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Tel. 0978 364500.

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Newark), Notts.
NG22 0LH.
Tel 0777870372.

Chichester Hi-Fi,
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Chichester, W
Sussex.
Tel. 0243 776402.

Churchers,
154 Montague
Street, Worthing, W
Sussex.
Tel. 0903 821 595.

Classic Hi-Fi & Video,
School Lane,
Kettering, Northants.
Tel. 0536 515766.

Fenway,
The Rookery, 71
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Tel. 0638 663166.

Bill Hutchinson Hi-Fi,
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(See our main ad on pg 125 for all our other branches)

Frank Harvey Hi-Fi,
163 Spon Street,
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H L Elliott,
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Whitehaven,
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Hi-Fi Excellence,
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Tel. 0325 481418.

Gilson Audio,
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Middlesborough.
Tel. 0642 248793.

Electrotrader Hi-Fi,
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Wales.
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Scotland.
Tel. 0224 624408.

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Wick, Kingston on
Thames, Surrey.
Tel. 081 943 3530.

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Tel. 0382 26591.

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Tel. 0935 79631.

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Tel. 0709 370666.

Music Matters,
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Tel. 021 742 0254.

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Musical Images,
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Tel. 081 569 5802.

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Tel. 0734 585463.

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Tel. 0223 68305.

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Tel. 0260 280017.

The Powerplant,
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Street, Sussex.
Tel. 0273 775978.

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Tel. 0533 530 330.

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Tel. 0905 58046.

The four faces of Da Capo

Dominic Baker auditions the latest Da Capo CD convertor from Pink Triangle - with each of the four filters now available.



It's back. And this time it's looking and sounding better than ever. Nearly a year after we first reviewed Pink Triangle's unique discrete CD convertor a second look is in order. Even though Da Capo has been on the market for 14 months now, there is still no other discrete DAC to rival it, and Pink Triangle have used their lead well. The latest Da Capo is now available with a microprocessor controlled battery power supply and four different analogue filter options, including Philips' latest, the 1307.

Da Capo now offers an extremely versatile and professional package that provides the consumer with an easy and convenient upgrade path. This starts with the choice of analogue filter. When we first auditioned Da Capo, two were available, 18-bit and 20-bit, the former offering a warmer 'analogue' sound and the latter, in my view at least, a more precise, accurate balance. There are now two more options, Yamaha's 22-bit filter which I have heard sounding superb and Philips' 1307, of which this will be my first experience.

Once a preference for a particular

filter has been established, there's the battery power supply to consider. DC, as it's known, is basically a large rechargeable battery pack which, when connected, provides an extremely clean supply free from RF noise to the digital-to-analogue conversion stage. Many designers believe that RF noise has a detrimental effect on digital-to-analogue conversion, and in fact on the whole audio chain. Using batteries virtually eliminates RF noise and they have the additional advantage of being able to supply massive current instantaneously without a drop in supply voltage. The disadvantage is price (£1500), weight (15kg) and a limited life span (the batteries in DC are estimated to last 5 years). In addition they need to be regularly charged, but in practice the batteries last for a good 10 hours, and recharging can take place overnight.



18 BIT
Listening to the 18-bit filter came as a bit of a surprise. I

remembered it sounding quite warm and full a year ago, but having listened to a large number of convertors this year, my perception must have changed somewhat. In comparison to the Crystal CS4328 equipped DACs it sounded positively thin and lacking in body. With Aimee Mann's excellent pop songs on her debut album "Whatever", vocals were smooth and well projected, but I couldn't help feeling that some of the character of her voice was being lost. On 'Fifty Years After the Fair' Aimee's voice sounded cold, almost forced and the electric guitar wiry, as if the track were being performed in a hard, bare walled studio.

As this album is fairly new to me I decided to go back to something I knew a lot better and had heard on a wider range of systems. Suzanne Vega's first album was pushed into the transport, only to confirm my first impressions and reveal further shortcomings. Again, vocals lacked the body and warmth they deserved and I knew existed on the recording. The midband was very clean and clearly focused, the treble sweet and detailed and the bass dynamic, if a little

dry, but the whole sound needed more texture and richness to be really musically rewarding.

The Da Capo with the 18-bit filter also had a tendency to diffuse instruments and vocals over the area between the 'speakers, rather than focus clearly on the origin of the sound. This blurred the image slightly over a two dimensional plane and the stage of sound was not quite as deep as I have had with other DACs. This tendency to compress the soundstage into a flat plane made it difficult to place the constituents of a band, for example with REM's 'Talk About the Passion' it became hard to tell whether Stipe was standing at the front of the stage or back level with the percussion.

Don't get me wrong, Da Capo with the 18-bit filter is still head and shoulders above most other DACs at the price in terms of detail resolution, but by the very latest standards this presentation isn't the most musical I've heard from CD.



20-BIT

I preferred the 20-bit filter when I first heard it against the 18-bit a year ago, and

this feeling lives on, although again it didn't sound quite as good as I remember. After the 18-bit filter the 20-bit's softer, more relaxed midband came as a great improvement. Both Aimee Mann and Suzanne Vega warmed to the change and this brought about a much more enjoyable performance. The sound was more cohesive too, the soundstage opened out in terms of depth and the image focused more tightly. In addition, the bass gained a little more drive, helping it keep the music in time, putting a larger more dynamic kick behind drums.

In fact, the 20-bit filter had altogether more get up and go about it, making the 18-bit sound almost lethargic in comparison. The Lemon Trees were greeted well, with plenty of atmosphere and space around the performers and the fabulous harmonies on 'Submerge' sounded natural and free from any coarseness. However, the treble did come across as being a little splashy, especially where tempo increased and cymbals crashed repeatedly. This also revealed itself with REM's classic 'The One I Love', although the Da Capo did well to follow every note cleanly and clearly enough to keep tight rein over individual instruments throughout the whole track.

The 20-bit filter, I found, is not as intense as the rather forthright 18-bit filter. Ultimately it doesn't resolve quite as much detail, but what it does

resolve is played with greater integrity. This gives the 20-bit filter, in my opinion, a more musical and enjoyable presentation, one that I could sit in front of for more time than the 18-bit.



22-BIT

With the Yamaha 22-bit filter inserted a window onto a new level of performance

was opened. In comparison both the 18 and 20-bit filters sounded veiled, or dark; the 22-bit has a brighter, more open and, I thought, truthful presentation. Amiee Mann's vocals positively leapt out of the soundstage to take up a position a few feet in front of me, whilst bass drums rolled forwards from the back of the stage, growing in strength as they came. The 22-bit filter has real balls, and I was starting to get an idea of just what Da Capo is capable of. It has the level of detail of the 18-bit filter, spread out over an extra dimension, and the natural 'rightness' of the 20-bit filter, but taken a whole step higher.

Gone was the slight splashiness in the treble and in return a sweet and delicately textured alternative took over. Cymbals were hit cleanly, the characteristic tap of wood on metal easily identified. The midband now had dimension and could come at you with real verve. Bass lines had all the slam and

attack anyone could ask for; at last I could shut my eyes and start to imagine the performers in front of me, locating them with apparent ease.

The Quads were really starting to sing now and the whole system pulled together to create one of the best displays of precision-imaging I've heard. Placing performers on the sound stage became child's play with high quality recordings, allowing the rest of the performance to be fully appreciated.

I ploughed back through my albums as far as some early Pixies, which took on a whole new lease of life, so full of energy and excitement that I'm sure the neighbours thought they were playing live in my flat at one point.

If you want a convertor that gets you involved in the music, this is the one. I spent several hours frantically playing as many tracks as I could, keen to see what it could do with each new disc I threw at it, and wasn't disappointed once. It plays bass lines with authority, has plenty of punch in the upper bass giving a strong rhythmic foundation, a lucid, natural midband, precisely etched treble - and all played within a large, believable soundstage.

With the 22-bit filter in place, Da Capo really is a top flight convertor and I would be shocked if it could be bettered for similar money with current technology. There are a lot of good DACs around, but this seems to draw on all of their strengths and present them in one tidy package.



Da Capo uses high quality surface mount components and a modular approach to allow future upgrades with ease.



Because we thought about it. Deeply. Our R&D people spend their lives immersed in speaker design – but never out of their depth.

Bathtime operatics may have inspired the SIXES concept, first seen in the original successful SIXES. You see, four-square walls generate standing waves which boost 'boom'. Fine for resonant renditions of 'Nessun Dorma', but fatal to accurate musical reproduction.

Similarly, since sharp edges cause sound diffractions, playing havoc with frequency response and believable stereo imaging, our six-sided cabinets adopt a more oblique approach.

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To read more about the new SIXES – write today or phone 0236 420199. But for the absolute truth, all you have to do is to listen.

There's just one reason why the new SIXES loudspeakers look and sound as they do.



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1307
This is where I start to get really confused. At first I preferred the 1307 over the

22-bit filter for its extra presence in the bass and slightly softer overall sound - but then?

In a comparative demonstration I can see most people preferring the 1307, it sounds less forward than the 22-bit, and the soundstage swells outwards further still. It's the kind of sound you think you could live with week after week and that will probably persuade most listeners. Whilst I'm sure that just about everyone will prefer the 22-bit and 1307 filters over the 20 and 18-bit, I'm not sure which of the former two will prove most popular.

The 1307 isn't quite as precise as the 22-bit filter; it doesn't place an image with quite the same degree of accuracy

and it sounds a little too rich to be strictly truthful. But it is extremely musical and certainly more relaxing to listen to than the 22-bit, the side effect of which is a slightly less exciting or involving presentation. If I had to choose one or the other as a reviewing tool I'd go for the 22-bit, as it is probably more adept at showing up differences in partnering equipment. As a means to a musical end though, the 1307 just gets it. The extra warmth and expansive soundstage compensate for the slightly less incisive delivery.

Here's where I duck out: it's now purely down to personal preference. You'll have to make up your own mind, but don't worry too much, both are superb and which ever you choose, rest assured that you will have, in my opinion, the best CD convertor currently available, regardless of price.

MAINS OR BATTERY?

From my listening experience with Da

Capo I would recommend the battery power supply only to those who can comfortably afford it. The 22-bit and 1307 filters are the important bits here (if you'll excuse the pun) and adding the battery pack makes a relatively small difference. If you're on a budget the mains powered Da Capo offers excellent value for money, and a cheaper upgrade may well be the addition of a dedicated RF mains filter. These are available for £100 or so, and do a similar job to DC for a fraction of the price. Yes, a DC'd Da Capo is the ultimate, but as with everything at this level, you have to pay for it ●

The Cost of Excellence

Da Capo (including either 18 or 20 bit filters) £1450

18/20 bit filter	£189
22 bit filter	£249
1307 filter	£299
DC	£1500

MEASURED PERFORMANCE

18-BIT

Frequency response
Hz-21.25kHz

Distortion %

-6dB.....	0.0065	.....	0.0070
-30dB.....	0.022	.....	0.022
-60dB.....	0.70	.....	0.66
-90.....	34.7	.....	33.7

Output.....2.36V

20-BIT

Frequency response
4Hz-21.06kHz

Distortion %

-6dB.....	0.004	.....	0.005
-30dB.....	0.008	.....	0.013
-60dB.....	0.61	.....	0.61
-90.....	30.2	.....	30.5

Output.....2.36V

22-BIT

Frequency response
4Hz-21.25kHz

Distortion %

-6dB.....	0.006	.....	0.005
-30dB.....	0.008	.....	0.007
-60dB.....	0.61	.....	0.57
-90.....	32.0	.....	31.2

Output.....2.36V

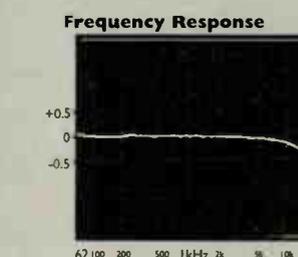
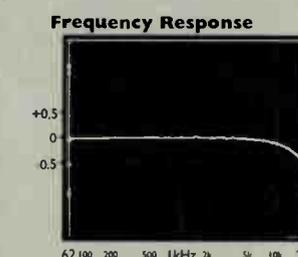
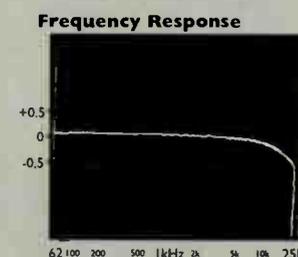
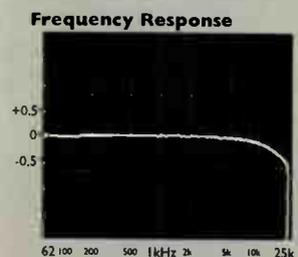
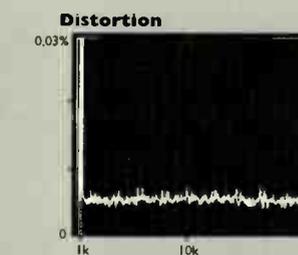
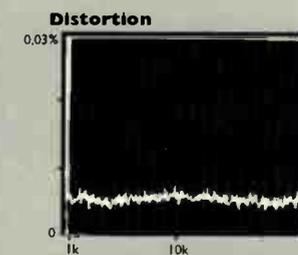
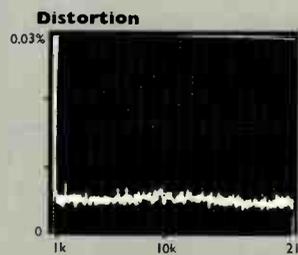
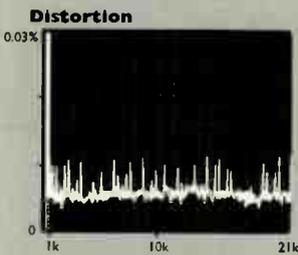
1307

Frequency response
4Hz-21kHz

Distortion %

-6dB.....	0.0041	.....	0.0048
-30dB.....	0.02	.....	0.02
-60dB.....	1.62	.....	1.03
-90.....	29.9	.....	29.4

Output.....2.62V



THREE YEARS OF

Hi-Fi World is now three years old. Here's a look back over our best year yet,

Phev, I wrote one of these last week. Or so it seems. Two years of Hi-Fi World appeared in our March 1993 issue and already it is time to write about three years of World History. Then, it was looking back; today we're looking forward, 'cos over the last year Hi-Fi World has found its little niche in the world and has started to fly.

What happened? Quite simply we started doing what we wanted to do, but most feared doing: a DIY Supplement. The first one appeared with our February 1993 issue, too early for me to know at this time last year whether anyone out there wanted such a thing. But now, one year and six supplements later we know that, literally, the whole world is fascinated by DIY. We're besieged by interest, as much from abroad as at home, and this has set a whole train of events in motion.

It has had quite a dramatic effect upon our sales, as you might imagine, acting as a superb way of introducing Hi-Fi World to a wider audience which, as a new magazine, is just what we needed. Not everyone is an avid DIY enthusiast, but the Supplement provides unusual and entertaining reading, it seems from your letters. Regular readers will have seen the figures we published in our November issue showing how this has resulted in a rising circulation, at a time when that of all the other hi-fi magazines is falling - something that has changed our outlook. We expect to be expanding the magazine over the coming year, partly in DIY.

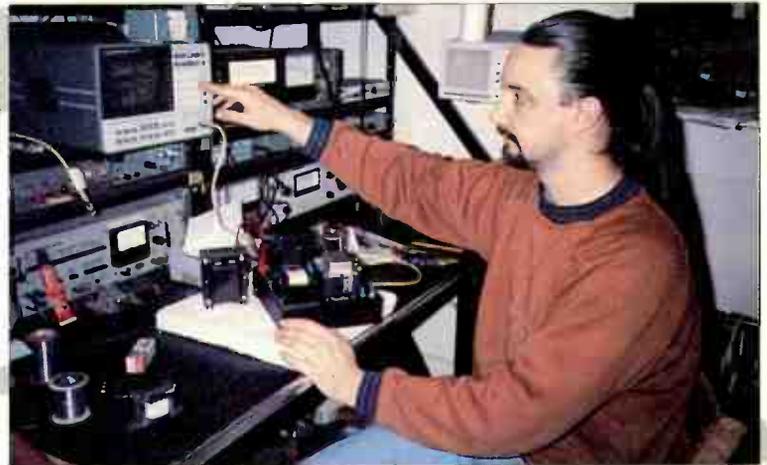
Our fear of entering DIY, which I mentioned earlier, was based on our

doubts at being able to generate enough high quality material. Happily, this did not prove to be an insurmountable obstacle. It was our second Supplement, published with the April 1993 issue, that resulted in a complete sell out - something that is rare in magazines.

The April '93 issue had the Mullard 5-20 valve amplifier in it. That valves presented in DIY form should fire people's interest isn't something that would pass me by. I built valve amplifiers and radios through my teens, including the Mullard 5-20, then went on to study electrical engineering as a result. But until that April supplement flew off the shelves I had supposed that people weren't as addicted to the things as I am. Boy, was I wrong!

Because transformers for the Mullard 5-20 were both rare and poorly designed, we decided to provide a kit, using an outside supplier. There was great interest, but unfortunately things started going wrong. The carriers were playing football with them and they were arriving smashed, the

heavy transformers creating havoc. It wasn't just the complaints and problems that hurt though, it was for me the desecration of the principle. These kits were meant to provide pleasure, as a small HAC one-valve radio kit my father once bought me at 14



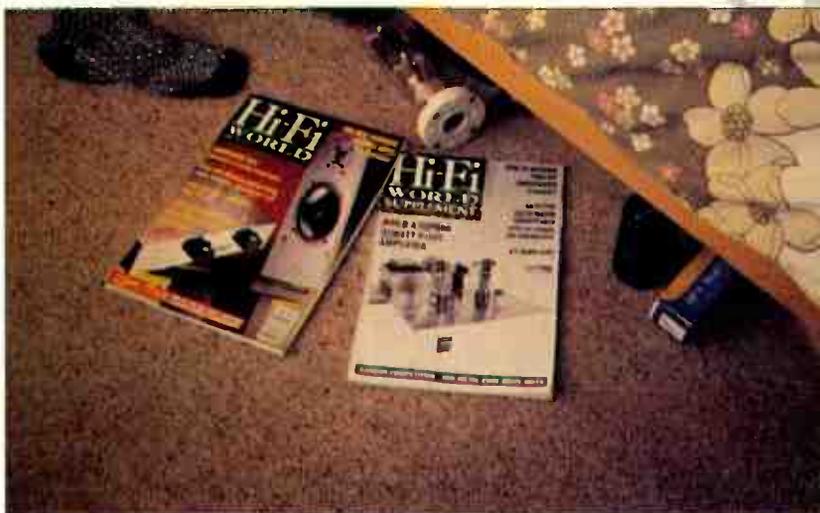
Andy Grove is now employed as a full time designer and technical expert - seen here testing the 4W single-ended.

had done. Having them arrive in tatters had disappointed many people, so we stopped the whole exercise as quickly as possible and brought the operation in-house, so we could exercise complete control.

It was at this juncture we effectively started manufacturing and that has permanently altered the structure of Hi-Fi World, taking it further in a direction that always looked attractive to us, even though it is contrary to publishing wisdom. Luckily, because we publish our own magazine we have the freedom to make such a move; all the other mags are produced by major publishers who could not integrate manufacturing into their structure, even if they wanted to.

So the Supplement projects spawned kits and the kits had to be manufactured. We use the same subcontractors as everyone else in the UK hi-fi industry, so a Hi-Fi World kit is effectively of normal commercial quality (or better!), but not assembled. The popular image of kits is that they offer a cheap and cheerful option to commercial product. Not ours! Our view is that they should out-perform commercial product and set standards, mainly because that's what we feel comfortable with, but also because we have a reputation to maintain.

We don't intend to start volume production of these products, but there's plenty of room for us to develop entirely



A rare copy of the April '93 issue stashed under Noel's bed.

WORLD HISTORY

hi-fi world 3rd anniversary

and a look forward to what the future will bring, from the editor, Noel Keywood.



The prototype 300B parallel-single-ended, should appear in the June supplement.

novel designs for readers, and to prove that there's more to hi-fi than the standard solutions industry offers. A little bit of innovation won't go amiss.

The High Definition loudspeaker, KLS-2, was a good example of this, producing an unheard of 94dB from one watt, yet without any sacrifice to performance in any other direction. The big three-way KLS-1 was designed to demonstrate the beauty of matching a ribbon tweeter with a dedicated high quality midrange unit, getting away from the problems of twin-driver speakers, but sudden price increases and poor availability of the drive units we used rather compromised the design. I hope to be able to return to this theme soon though, where a super high quality midrange/treble enclosure handles the audio range from 200Hz up to 20kHz - and does it properly!

But back to the valve amp saga. Hearing very good reports about the ruggedness and reliability of the Russian 5881 valve, a military version of the renowned American 6L6 beam tetrode designed for low distortion audio use, I decided to produce a simple yet elegant 20watt stereo amplifier to replace the much requested Mullard 5-20. The outcome was K5881, which is a great amplifier. It's praised for its punchy bass and dynamism in particular, yet it's sweet and easy to sit in front of. We then followed up with the KLP-1 preamplifier which, with a machined and bright anodised alloy front panel, fitted with pale gold knobs (we even design and manufacture these), looks and feels like the "hewn from a block" custom made item it is.

At this stage, somewhere in Mid-1993

our 300B amplifier prototype was nearing completion and we were again wondering whether anyone might be interested in such a highly specialised, expensive and esoteric design.

Whoops! Wrong again! The demand - again from around the world - has been staggering. This design, however, being expensive and unique, has proven very difficult to get into manufacture, since it must reach the highest standard of performance. For example, the power supply capacitors are so unusual they have to be custom wound to our specifications. The driver transformers are hideously complex too. The first production batch should be going out by the middle of February 1994, but 300B will have a higher specification and standard of finish than we have quoted and we know owners are going to be surprised at what they receive.

The delay, with eager buyers from around the world phoning and faxing day and night, made worse by the appearance of our Single-Ended 4W (even more demand!), has pressured World Audio Design (the manufacturing side of the mag.) to take on a full time designer, Andy Groves. So our Supplements will continue

to appear regularly and there's no shortage of projects or enthusiasm for them, only a little difficulty with handling the outcome, but we are making efforts to improve this side of the magazine.

At present most of you won't have heard about Andy, but that will probably change. He's an expert with valves and transformer design, so he will be responsible for producing some superb valve projects in the future. The first design, which we commissioned some time ago and exists only in early "mule" prototype form is a twin-300B parallel-single-ended amplifier of 20watts output. Being broadly equivalent in outline to Yoshino and Ongaku, this design is going to be fairly spectacular. But before you start negotiations with your bank manager, you have to bear in mind that each monoblock carries four enormous transformers and that this sort of amplifier is ultra-esoteric and close to the ultimate. We don't know the price, but it will be affordable, if not cheap. It will appear as a DIY project later in 1994.

Finally, although I don't have much time to personally answer all the requests for



Our 4W single-ended amplifier and a clever pop-up card from Reiner Strasser, a reader from Germany.

information and help that pour in, I do still enjoy our various communications with dyed-in-the-wool enthusiasts from around the globe, from California to Singapore. Messages of thanks go to Reiner Strasser in Wiesbaden, Germany, who sent us a wonderful pop-up postcard of our 4W Single-Ended amplifier, and to "Jack from Warsaw" who sent us a superb Christmas card and complimentary message. For Jack and for Reiner and for all our readers, I hope 1994 will be a good year and we may be able to contribute a little toward it ●

THE HI-FI LAW OF DIMINISHING RETURNS

Ask a Hi-Fi dealer to upgrade your system, and he'll sell you ever more expensive bits of hardware, giving you a constantly changing sound, new solutions producing more problems which can only be solved with more expensive equipment. The harder you try, the more it costs and the less satisfying the results. This is the well known Hi-Fi law of diminishing returns. We have an alternative:

THE RATA LAW OF INCREASING RETURNS

Why buy new equipment when it makes more sense to realise the full potential of your existing equipment. Don't replace it, upgrade it; it's cheaper. Most equipment can be transformed by us for the cost of a dozen CDs. Magic? No - logic! To find out how we do it, ask for our new free Catalogue; it provides discussion, analysis and a definitive resource of audiophile components and advice on the art of recreating music in the home.

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SENSIBLE SENSITIVITY

A new trend in loudspeakers is emerging - they are becoming much more sensitive. Noel Keywood reviews four new models that need little power to go extremely loud, making them suitable for high quality, low power amplifiers. Dominic Baker applies the tests.

What a surprise to suddenly find no fewer than four new loudspeakers that are all extremely sensitive. It was only a few months ago that I complained in my column about the lack of speakers like this on the UK market.

Here we've gathered together a group of four new models, two and a half of



which have the Tricolour for France. But don't worry, they haven't finally managed to export the revolution two hundred years late, except perhaps in hi-fi loudspeakers. It's just that different influences have shaped their market and the models offered on it, resulting in 'speakers characterised by a different set of trade-offs, sensitivity being more important over there than over here. From Cabasse comes the stand mounting Prao, an apparently conventional twin-

driver design that pushes out no less than 90dB sound pressure level ('volume') for one watt of input power. Norma is the name Triangle give to their slim floor mounting design, and Norma goes even louder, managing 91dB for a watt. Half French, half British, the Harman Kardon LS 0500s use French Audax drive units but were designed in Britain (by a company owned by an American politician). These monsters turn out 89.5dB for one watt. And flying the flag for Britain come B&W 620s which surprised me during tests by producing no less than 90.5dB for a watt - an almost unheard of sensitivity for a conventional plastic coned Brit speaker. Perhaps it's the European sensitivities of B&W, part conferred by their Swiss-resident managing director, that have suddenly resulted in such an unusual specification.

So what does a 90dB sensitivity mean?

A 90dB loudspeaker needs three times less amplifier power than a typical 85dB British loudspeaker. So while Jim has to buy a 60watt amp to get decent volume at home, Jules asks for a 20watt amplifier and his speakers go just as loud.

There are three ways Jules wins out. He can buy a smaller and, therefore, potentially cheaper amplifier. Or he can buy a low power, super high quality Class A solid state amplifier, or a reasonably sized valve amp or a highly specialised single-ended amplifier, which don't go much above 20watts absolute maximum. Any of these amplifiers will give a better sound than most 60watt sloggers. Finally, because his speakers have lightweight cones, as they must to be sensitive, they react faster to musical transients, generally giving a livelier sound.

The last point is contentious, but it is being accepted by many people as one reason why many top line Brit speakers stand accused of being "dead, lifeless or dynamically flat". They use heavy, well damped plastic cones that give a great measured performance, but little else. This came about as a result of seventies research into loudspeaker cone materials by the B.B.C., which prompted manufacturers to move to Bextrene and Polypropylene. When companies like B&W, KEF, Celestion and Wharfedale equipped themselves with sophisticated research facilities at that time also, they merely confirmed what the B.B.C. had discovered, taking to plastic cones with enthusiasm.

It would be wrong of me to suggest that all plastic coned loudspeakers sound dead; quite obviously they don't. But too many top line monitors brewed up in

Britain have sounded perplexingly poor in relation to their enormous engineering input for questions not to have been asked.

There's another side to this argument though, one that raises its head here. Lightweight paper cones break up at high power levels, giving a coarse and confused sounding midband. Lest I get accused by U.K. engineers of presenting a one-sided argument, it is the case that some - but not all - sensitive loudspeakers will suffer this, something plastic coned speakers, with their good damping, are relatively immune to.

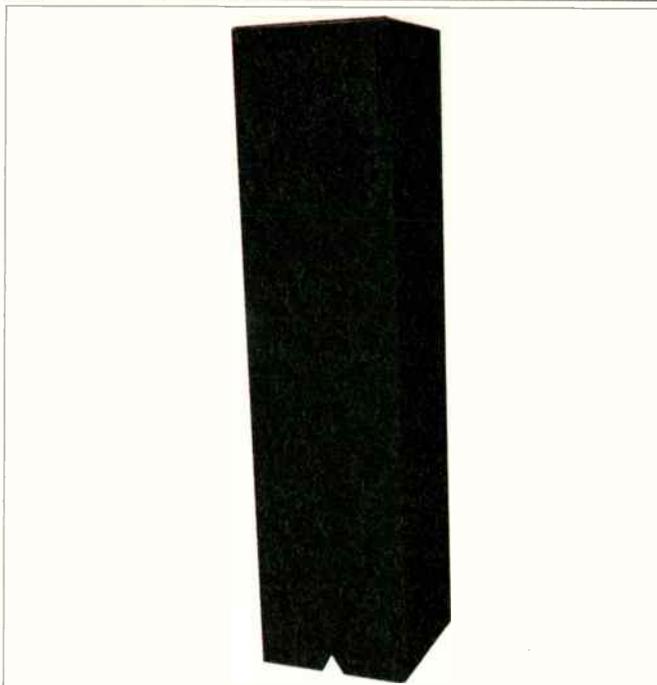
Moving from plastic cones back to paper could therefore be described as a retrograde step, but that really depends upon the quality and treatment of the paper cone. Ken Ishiwata, chief engineer at Marantz, tells me that the best way to treat a paper cone is to soak it in oil for 48 hours, but it's not a technique that lends itself to mass production!

So here are four high sensitivity loudspeakers under test. They join the



89dB sensitive, gorgeous sounding Heybrook Quartets and our own High Definition KLS-2 kit loudspeakers that push out no less than 94dB for one watt. The field is suddenly expanding and soon manufacturers may be making speakers as sensitive as ours (whoops, perhaps I'm not meant to say that!).

Triangle Norma £775.00



Part of living with a loudspeaker is fitting it into the home. Standing tall and slim, these floorstanders slide into small spaces easily. Better still, they need to be kept back, within about one foot of a rear wall, to enhance their deep bass output.

The tweeter of the Norma has a peaky response, at least when left 'au naturel'. We use a similar version of this tweeter in our own high sensitivity KLS-2 - but modified to smooth out its response. The Norma has quite sweet treble, but there's obviously some incisiveness to it. The steel strings of Rory Block's guitar on *Terraplane Blues*, from the album *Mamas Blues*, fairly whipped out from the speakers, stabbing at my ears, because of the tweeters. On closely miked material like this, the speakers hovered dangerously close to being unbearably sharp.

Yet the Normas remained tolerable. I thought they wouldn't last too long in my lounge, but running-in brought much needed articulation to their bass, improving the overall balance of the speaker, drawing my attention away from the sharp top end. Even tracks laden with high frequency information, such as Steve Earl's memorable Billy Austin, where he aggressively strums and picks a close-miked guitar, the tweeter never quite became painful. It lacks the purity of tone and the sheer differentiation of high frequency textures - the timbral difference between a triangle and a cymbal for example - that better tweeters can manage, but then Triangle, we know, faced a problem here. Whilst the tweeter they use isn't particularly

expensive, it is very efficient - and that's why they had to use it.

Overall, this speaker has a light, but dry and detailed sound. Initially it sounded somewhat expressionless, but running in loosened up the bass in particular. The Norma has a well controlled, articulate bass performance, light on deep bass, but not sufficiently without it to lack impact. I was very impressed by their handling of Tina Turner's

bass-led *Break Every Rule*, a track that so many speakers completely fail to make sense of. The bass playing was tight, fast and expressive in terms of clear pitch changes between the notes. Often this track comes over as a series of pitch-indeterminate thuds: the box of so many speakers goes 'boof...boof...boof', which doesn't amount to a very imaginative bass line! In contrast to this, the Normas play a bass line properly; they don't slur it, dip out on awkward notes or accentuate just one or two. What they don't have though, is foundation shaking bass. It's just good, an' solid an' clean.

It's across the midband that these speakers offer a sense of clarity, cleanliness and projection that I found impressive. They imaged well and were

able to construct clear, if light and slightly vapid images well out of the box. Lack of colouration, from box or drive unit, helped in this respect. I couldn't seriously criticise the Norma's ability to put Tracey Chapman out of the speakers, even if her voice wasn't quite as gravelly as usual. There was so much detail, so much insight that I suspected enhancement, but our frequency response plot shows nothing excessive.

The insight of these speakers has to be balanced against their tendency to hold the sound stage back in the plane of the cabinets, rather than let it move forward and show dimensionality. Whilst I was using the Normas I was reasonably happy about them, but replacement with Heybrook Sextets showed how flawed they are in this respect, appearing drily compressed and a little shrill in comparison - and the Sextet is quite a bright, remorseless speaker, if one of great resolution. Charleen Spiteri of Texas - surely a Chrissy Hynde for the Nineties - sounded a little thin in voice and held back on the sound stage through these speakers. They do lessen the body and natural resonance of singers a little.

The Normas were fast and exciting, of that there's no doubt. They convey pace and rhythm well and they sound lively and clean. Their overall balance is definitely of the 'hi-fi' variety, with some emphasis in the upper midband throwing detail out mercilessly - but thankfully not sibilance too. I prefer a slightly fuller bodied sound, but this didn't temper my appreciation of them.

Triangle's Normas have to be given a high score. They rate highly for honesty, revelation and control. They're enjoyable to listen to, if a little too hi-fi-ish to be entirely natural. But the simple truth is that above about £400, speakers commonly start to get worse, rather than better, leaving the Normas with far less competition than they rightly should have ●

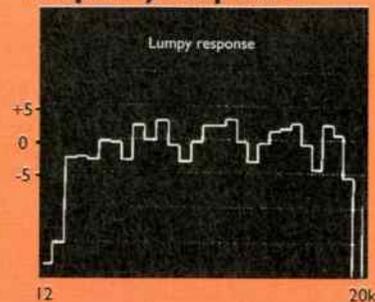
MEASURED PERFORMANCE

The Norma's gave 91dB for a nominal 1 watt input; it means they only need 10watts or so to go very loud. The impedance curve stays above 5Ω over most of the audio band and overall they measured 8.2Ω.

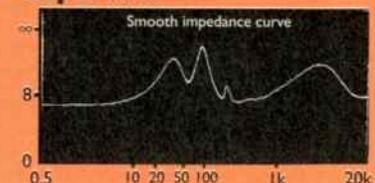
The frequency response of the Normas is a little lumpy to say the least, being made up of a series of peaks and troughs. I wouldn't expect them to sound especially smooth, but the peaks are quite well placed to push vocals forwards and enhance treble detail, so they may sound quite lively. In the bass a clear downward trend can be spotted which suggests that the Normas will be quite light sounding, but wall reinforcement may be enough to give good balance.

The Triangles have been designed from a different angle to that we are used to in the UK. Whether this is a valid compromise can only be assessed by listening. **DB**

Frequency Response



Impedance



Cabasse Prao £480.00



deliberately to augment their bass. And in this position their bass was tight, but impactful, with plenty of punch and no overhang. But back to Bridges. Those rich, resonant tones of Tracey Chapman's voice were beautifully projected into a space between the speakers, apparently removing the Praos from the music altogether, which is how it should be. Their ability to project out of the box was superb and the minutiae of

began to have reservations. It was with less balanced and clean sounding CDs, and as volume went up, that the upper midband started to sound hard, sharp and muddled. At first I thought I was pushing our K5881 20watt valve amplifier too hard when Matt Johnson's vocals on Dusk lashed my ears, sounding acidically coarse and sharp. So on went a pair of Audiolab monoblocks. This only served to confirm that it was the speakers hardening up under power, not the amplifier. The Lemon Trees lovely Beatles sound-alike, Love the Sun suffered badly too, coming across as harsh and muddled at high volume levels. Out of interest, I wired up a 'scope and found I could take absolutely no more than 20watts on peaks, showing just what impact sensitive loudspeakers have upon power requirements.

In truth the Praos are level dependent. They suffer from increasing amounts of cone breakup at high volumes, making for harshness. Keep volume down and they come across as a speaker of superb lucidity. Push them and they'll get a little nasty with you, especially with bright recordings, of which there are many on CD. Speaker engineers who've made the change from paper to plastic will smile wryly at this, knowing that it is a problem 'solved' many years ago by the adoption of polypropylene, which has better internal damping and a smoother sound at high power levels, even if it introduced other problems.

Sounding more amenable than CD, LP does fair a little better with the Praos, but the percussion on Sade's Smooth Operator sounded just a little too sharply defined at times, showing how 'impressive' these speakers can make everything and how, at the end of the day, they erred just a little too far in this direction for me to be able to be wholly enthusiastic about their performance. However, these speakers are certainly worth auditioning, for they are - impressive! ●

"Impressive" is a word that can be used in all its shades of meaning for this speaker, from praise to facetious observation. In basic character it sounds tight as a drum in the bass, of glassy clarity across the midband and with strongly projected treble that aims to take no prisoners. The Prao is also well integrated in that it sounds to be much of a one-ness, displaying tight, clean and controlled behaviour right across the audio band, from low bass to high treble. Listeners, with one exception, were impressed and, with an exception, so was I.

Chapman's phrasing and inflexions came under a spotlight. Here's a speaker that really projects upper midband detail, to brutally reveal every nuance of performance. It was impressive with a capital 'I' and listeners consistently remarked at just how clear they sounded.

The tweeter has, I suspect, been designed more for sensitivity than anything else and came across as a little spitty and sharp, if not over-emphasised.

That, in a nutshell, is how I found the Praos. They image superbly well, putting a well defined stereo stage right out into the room, they sound cohesive, bright and tight. There seemed no lack of dynamic get up and go either: these speakers are fast and lithe.

With time and exposure though, I

Take a clean, full bodied recording like Tracey Chapman's Bridges, from the Crossroads album and the Praos really sing. They hold the inflated bass guitar in check, without robbing it of power or pitch differentiation. I had to be impressed by this, for it puts the speakers well up the ladder of my regard. Finding a speaker that has strong, clean bass, especially from a relatively small cabinet, isn't so common and no one complained about this aspect of the Praos.

But whilst they seemed to handle fundamentals cleanly, in truth low bass rolls off somewhat and there is little really deep bass of the floor shaking variety. Whilst this isn't much of a drawback for me, it might be for some listeners, especially budding organists who demand to hear every pipe Peter Hurford uses, including CCCC down at 16Hz.

My 16ft x 12ft listening room has modes that complement speakers which are tight or a little light in the low bass region, so it helped the Praos, but they may well sound bass shy in a much larger room, or when used far from a wall; I placed them 2ft from a rear wall

MEASURED PERFORMANCE

The Cabasse Praos reach 90dB at 1m for a nominal watt input. This is around 4-5dB higher than the average British loudspeaker so they will go considerably louder for the same volume setting on an amplifier.

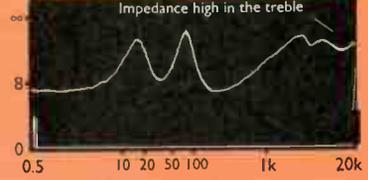
They are badged as being 4Ω loudspeakers, so I was surprised when I measured exactly 8Ω overall. In fact the impedance curve is a bit of a strange one. It starts off very low down in the bass at around 4Ω and from 200Hz upwards the curve starts an up-hill climb towards 2kHz where it settles, until 20kHz, at around 20Ω. The curve is quite smooth, so it is not especially reactive, meaning most transistor amplifiers should have no problem driving them.

Overall, the Praos measured extremely well; response flatness is not sacrificed in return for sensitivity. They will suit a wide range of amplifiers. **DB**

Frequency Response



Impedance



LS 0500 £299.99



imaging, which is constructed on a grand scale between the cabinets. Seemingly a bit recessed in the midband, due to slightly forward bass and treble output and the phase-suckout, these speakers fill the room all the same. They're mightily impressive, reminding me of the way Quad ESL-63s put out a sound stage so large, yet pin sharp and real that it barely seems credible in comparison to the average 'speaker.

The '0500s don't quite come into the same league of believability, because they are slightly vague and mellifluous in terms of image sharpness, putting vocalists in the middle - somewhere. But I didn't object, 'cos these are fun speakers in the best sense of the word.

Thuddy deep bass and a certain vagueness of dynamic, a lack of really fast punch, had me puzzling a while. The Harmans have bass, and plenty of it, yet it isn't possessed of cohesive transients. Then I realised that this speaker has twin rear ports and that such ports commonly seem to produce low bass that follows high components in a somewhat random and lackadaisical manner. Limitations here were most obvious with rock, where percussion could have had little more

impact and cohesion. However, in spite of a little emphasis in the power behind Perlemuter's left hand on Chopin Opus 48 No1, the '0500s showed how convincingly they reproduce piano; this classic swelled in strength towards its climax, without restraint. Perhaps there was a little touch of box colouration and boom, but it hardly seemed important in the overall scheme of things.

The tweeter isn't the best one I've ever sat in front of. It had a very obvious sting caused by a peak and it also brought a slightly splashy sound to cymbal crashes. My Fearless Heart had Steve Earl's jangling steel guitar sounding sharp and forward, whilst Earl's vocals were a little far back in the mix, yet I couldn't deny the overall presentation was impressive enough, if not strictly accurate and also a little acerbic, I felt.

Where the '0500s scored strongly was in their ability to resolve tonal colour. They revealed the full range of expression of vocalists; small details of enunciation, of phrasing, of delivery were conveyed clearly. Hooker's croaky vocals and strummed National Steel guitar sounded wonderfully alive and atmospheric on Hittin' the Bottle Again. I've heard sharper and more up-front renditions, but I've not heard many sounding as rich and fulsome as the performance these speakers conveyed.

In spite of the tweeter's sharpness and the lacerative quality of steel strings, just to take two examples, I still found the '0500s both relaxing and entertaining to live with. They're not especially accurate and they do have some sonic idiosyncrasies, but at the end of the day, they also manage to convey much of the artistic and emotional content of a performance, rather than its structure and the purely mechanical qualities of the instruments being played. You get a lot of speaker for the money in every sense of the word and, to boot, one that turns 20watt amplifiers into roaring giants ●

The LS 0500s stand tall and slim, possessing two bass/midrange drivers and one tweeter. The unusual proportions allow them to slot into a room nicely, but sheer height gives them an Eiffel Tower presence, which might not be to everybody's liking. Behind the grill lie two yellow coned drivers and a tweeter. Putting an ear against the cone-drivers in turn I noticed that both handle all of the audio band, which means that they will phase-cancel in the midband, affecting the sound. It's an odd thing to do; designers normally feed only bass to the lower unit to avoid such cancellation. The suckout it produces has an audible effect. However, this has to be balanced against some unusual strengths, notably the speaker's ability to make 10watts sound like 100watts.

Whilst all four models were chosen as examples of a new breed of sensitive loudspeaker, the Harmans were most adept at delivering music in all its power and glory, perhaps adding a touch to the glory. Whilst swingeing highs came from a crash of cymbals, sending energy ricocheting off the walls, deep, thunderous bass rumbled around the room, flapping the carpet. Yet our K588 I amplifier driving them was idling along, pushing out 5watts maximum according to the 'scope, with the odd transient, like a lisp or cymbal crash, hitting 20watts for a few milliseconds. It was difficult to believe the '0500s were merely sipping at power when they filled the room from ceiling to floor with sound like this.

In part, these speakers sound massive because they stand tall and radiate sound equally from two widely spaced bass/midrange units. I first noticed their

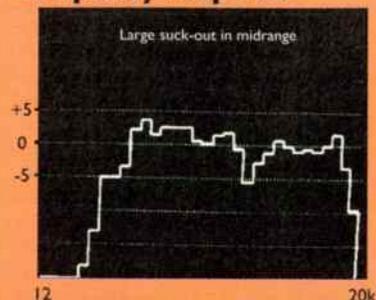
MEASURED PERFORMANCE

Harman Kardon's LS 0500s are literally a doubled up version of the excellent 0300s reviewed back in November. Both the top and bottom drive units handle bass and mid frequencies, so the suck-out in the middle was inevitable. The rest of the response is reasonably tame with just a small lift in the treble which will add some brightness and a steady lift in the bass which should give them plenty of welly.

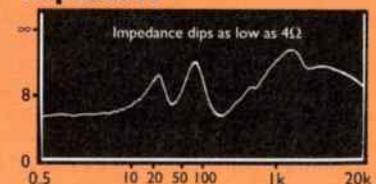
Again, they are very sensitive at 89.5dB for a 1 watt (2.8V) input, but the '0500s are the least efficient of the group. Their overall impedance of 7Ω and an impedance curve that drops as low as 4Ω means that the 4Ω tap on valve amplifiers will give best results.

A little bit of an odd-ball these, but the glass fibre cones have a crisp sound which should make the LS 0500s a pleasurable 'speaker to sit in front of. **DB**

Frequency Response



Impedance



B&W DM620i £399.95



with energy and dynamics aplenty. The bass is a continuous box-bound rumble, mediocre in definition, but good enough all the same to be able to play bass fundamentals properly, conveying pitch change between notes.

There's too much of it, that's for sure; this is a speaker for retired steamroller drivers. But whilst the unimaginative one-note 'bass line' behind Steamy Windows just filled the house with low

frequencies, Robbie Shakespeare's fascinating twists and turns on bass in Pars, on Grace Jones' Warm Leatherette, came across well. The 620is produce too much bass, and it's soft, yet they still manage to keep enough grip on deep fundamentals to play a bass line. OK, you can hear the box heaving at every seam with the continuous exertion, but bass is what a lot of people want, lots of it. The 620is are computer optimised to deliver as much as anyone could reasonably ask for, whilst arguably staying on the right side of being acceptable.

From the outset, however, I heard a tendency to force vocals through a megaphone, giving them a hollow sounding colouration. Tracey Chapman's resonant tones on Bridges, from the

Crossroads album, revealed this effect. It is least obvious when the speakers are listened to on-axis, with the drive units pointing straight at the listener. Move off-axis, however, and the megaphone colouration starts to make itself known; I suspect the deep cone profile of the bass/midrange unit has something to do with this phenomenon.

Related to it, is mediocre imaging and something of a box-related - if not box-bound sound. Again, when off axis, cabinet colouration becomes audible, even though B&W have used internal bracing. We also felt there was some muddle and splashiness affecting complex orchestral arrangements, which compromised clarity.

Although the colourations of this speaker identify it as a budget design over which a none too critical eye has been cast, the 620i has strengths. The midrange came over as smooth, although singers did sound somewhat reticent and backward on the sound stage in contrast to rivals such as Mission 760iSEs. Yet even though there's just a little edginess, vocalists don't hiss or spit; B&W seem to have got their upper midrange break-up modes and crossover characteristics well enough sorted to make the 620i sound generally quite smooth in its delivery.

These speakers convey dynamics and contrasts well; they have a lively, punchy sound after being run in. I was aware that the tweeter integrates with the bass/midrange unit relatively well in terms of frequency response, if not in character. It was quite easy to hear the tweeter as a separate entity making its contribution and even though the treble was easy on the ear, it was not especially clear or well defined.

The 620is offer a crisp sound with over large, but reasonably tuneful bass that reaches enthusiastically down to subsonic frequencies. They're sturdy sounding rock speakers that go loud with little power. I found I could enjoy them, in spite of their obvious blemishes, as fun speakers that deliver music with gusto ●

Here's a floorstander that delivers massive bass from a few watts of power. It's a surprise to hear so much coming from so little output, but it can be done, as B&W demonstrate. This is one of the most sensitive loudspeakers we have yet measured from a British manufacturer.

The 620is stand tall, but being essentially a budget design they are finished in an artificial ash veneer. The front baffle has ribs to break up surface waves and improve diffraction. It is made from dark grey plastic with light grey trim rings around the drivers, giving the speakers a sombre appearance a bit too functionally industrial to be attractive.

B&W use their own bass/midrange unit with an injection moulded polypropylene cone possessing a deep cone profile for stiffness. They partner it with a metal dome tweeter and a passive 'drone cone' bass unit, which acts as a port in effect. Although the theory behind passive radiators is persuasive and mathematically well ordered, they have a rotten reputation for producing slow, soggy bass.

It was the seismic rumbling coming from Tina Turner's Steamy Windows that underscored the basic character of these speakers. It shook the room and reverberated down the corridors; I realised that the 620is were reproducing subsonic bass with the sort of relish that's more the province of reggae sound systems. Steamy Windows sounded massive, a great wall of continuous rumbling bass trying to rearrange the furniture, underpinning Turner's flamethrower voice between the speakers,

MEASURED PERFORMANCE

The 620is use a 'drone' or passive radiator to enhance bass performance, the influence of which shows in their well extended bass response. The rest of the response is very flat, staying well between 2dB limits over most of the audio band, and there is a small lift in the upper bass which should add some useful punch, helping to minimise sluggishness.

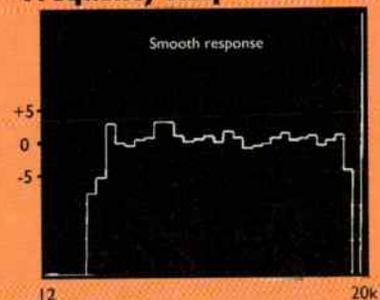
The impedance curve isn't especially flat, making the 620is a reactive load, but the overall figure of 7.5Ω means that they won't draw excessive current.

Like all the 'speakers in this test the B&Ws are unusually sensitive, measuring 90.5dB for a 1 watt input (2.8V) measured at 1m.

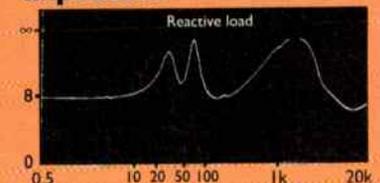
A flat response and high sensitivity should give the B&Ws a smooth and lively sound; they could be a bargain for the price.

DB

Frequency Response



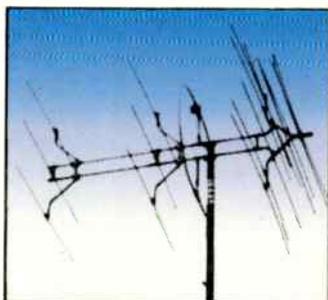
Impedance



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CONCLUSION

It's always dangerous to generalise, and these speakers prove the point. Two were described by listeners as having "sluggish" bass: the Harman 0500s and the B&W 620is. So not all sensitive loudspeakers could be described as fast and lively sounding. In both cases though, the speakers had emphasised bass that went down very low and it is the case that heavy deep bass can make a speaker sound slow. Yet many people say they like lots of bass, spurring manufacturers on to providing it.

The B&W 620is suffered from ponderous bass and they attracted criticism as a result. We stuffed them with long haired wool, hoping to improve bass damping. Some small improvement could be had, but it was too small to be worthwhile, which is a pity. Two listeners independently commented upon upper midrange muddle too, so the 620is have obvious limitations. However, they are not without some strengths too, sounding quite smooth and mild mannered overall.

Harman's LS 0500s were entertaining, having better quality bass than the B&Ws - and no shortage of it either. I found the speakers easy to enjoy, as did some others, but most people noticed their vague imaging and occasional treble rasp. In truth, putting two bass/midrange units into a speaker is none too clever; the lower unit should have been fed bass only through a filter. But the bottom line is that these speakers turn a flea-sized amplifier into a roaring giant and for that I'm sure there will be takers.

The Cabasse Praos impressed everybody, with one exception who, like me, felt they



were just a little too sharp, spitty and sibilant at high volume levels. All the same, the Praos were greeted by all listeners as sounding very clear, well integrated, tightly focussed and of superb bass quality, in as far as it went; there was little really deep bass. The Prao is a monitor quality speaker, but it should be used with warm or soft sounding amps or sources.

Triangle's Normas offered a sound balance similar to that of the Praos, one that leans dangerously close to being a little too bright and sharp to come across as balanced. Their resolution of detail was superb and they possessed more bass than the Praos, but otherwise I again had reservations about their edge-of-the-seat qualities. It is possible to produce a loudspeaker that offers hi-fi levels of detail without such upper midband forwardness; the Norma wasn't a laid back speaker, shall we say, but it could again complement softer, warmer sounding sources and amplifiers well.

We already know that Audax, French manufacturer of drive units, are working on more advanced materials that

promise twice the stiffness and 30% less weight than paper! Perhaps the nineties will see these high tech materials used to get both high sensitivity and good measured performance ●

'SPEAKERS SPECS - WATCH OUT!

Some speakers barely raise a squeak with 100watts, yet they'll have a great sensitivity figure of 88dB for 1 watt, or similar. It's all down to using a misleading and, in our view, invalid way of specifying loudspeaker sensitivity. Here's what to believe and not to believe in loudspeaker sensitivity specifications.

The Sensitivity specification of a loudspeaker is likely to be phrased in one of two ways:

- a) 86dB for 1 watt
- b) 86dB for 1 watt (2.8V)

The one to beware of is a) because it is likely to be misleading. The minor qualification of 2.8V added to b) makes all the difference. The latter is called a 'voltage sensitivity' whilst the former is a 'power' sensitivity which, although technically correct, is positively misleading to buyers.

Here's why. Your amplifier can only swing a certain maximum output voltage and its volume control position, which to a user relates to volume level, controls output voltage, not power. If the speaker in a) has an overall impedance of 10ohms (it may carry an 8ohm rating - but that's another story) then it will need 3.2V to push 1 watt into it to give 86dB sound pressure level (volume).

The speaker in b) has its sound output related to a voltage of 2.8V (a 'nominal watt'). The amp has to produce 2.8V for 86dB in this case (impedance is irrelevant) meaning its volume control will be at a lower setting, so to a user, the speaker goes louder at any particular volume control setting, which is what a sensitivity rating is supposedly about.

Relating sensitivity to true power input is academic and, generally, flattering to a speaker (of course). Look for the sound pressure a speaker produces from a VOLTAGE input of 2.8V.





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HIGH SENSITIVITY - WHAT IT'S ABOUT

Noel Keywood explains the meaning and benefits of high sensitivity loudspeakers.

High sensitivity comes from building drive units with lightweight cones, something that is likely to become increasingly popular in the nineties. Light cones don't store or dissipate as much energy as heavier plastic cones. They respond to transients more adroitly, giving a loudspeaker life and verve in its sound. The days of heavy, quacky, power-hungry plastic cones may well be coming to an end as we find new and better cone materials.

Better still, high sensitivity speakers bring flexibility to amplifier matching because high power amplifiers become unnecessary. Let me illustrate this. Whilst listening to the four models in our report I used an oscilloscope to monitor amplifier output and a Bruel & Kjaer precision integrating sound level meter to measure peak sound pressure level at my listening position 10ft in front of the loudspeakers, in a listening room set up that must be reasonably typical of many, shown in the diagram. Using our K5881 20watt valve amplifier, I could barely get it up to full output before my ears, the neighbours and the roof could take no more.

Take Carl Orff's *Carmina Burana*, for example. The dramatic introductory sequence, complete with choir and thundering kettle drum I played at full volume through the Harman Kardon LS 0500s. Back at the settee, 10ft away, the sound pressure meter registered no less than 104dB from the choir and 106dB at every drum strike.

Putting that into context, 100dB is commonly taken as very loud to most people, drowning out speech, although I have to say I have met one or two reviewers who listened at a level above anything I could stand, hitting around 110dB I'd guess. That's head-banging level. A road drill manages about 115-120dB and Concorde, when it takes off at 7p.m. every evening after the Penta Hi-Fi Show, hits 122dB with after-burners aflame - enough to make me clamp my hands over my ears to avoid pain.

How much power did the '0500s need to hit 106dB? The oscillogram shows that the drum hit 18volts peak whilst typical average music level for this particular musical sequence was around 12volts peak, giving (rms) powers of

20watts on peaks and 9watts average.

So. A loudspeaker of around 90dB sensitivity will go as loud as most people can stand with a 20watts/channel stereo amplifier. The real value of this is that it allows specialised low power amplifiers to be used, or just sensible high quality designs like the Naim Nait 3 or Sugden A2.1a, for example.

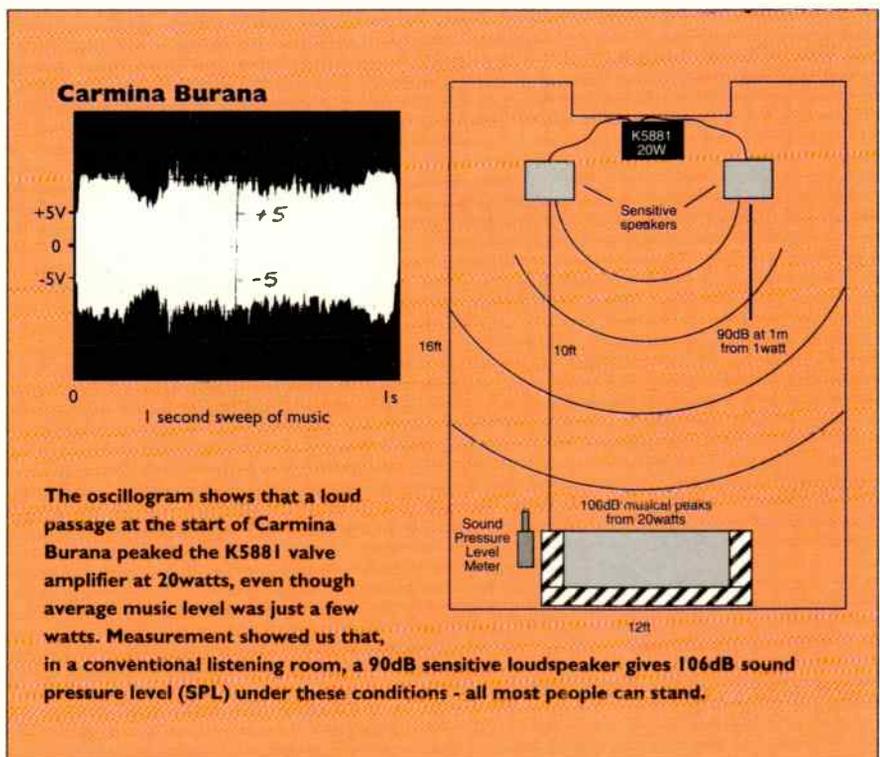
Amplifiers all of a sudden need not be massive, expensive, power hungry monsters and this opens up various other options in choice of output device and circuit configuration within an amplifier. Pure Class A designs become useable, as do valve amplifiers and single-ended amplifiers (solid state or valve). Amplifier designers for their part don't have to place a priority on power, they can design for better sound quality. So high sensitivity 'speakers are enabling; they enable amplifiers to break away from the constraint of high power delivery, towards better sound quality.

But that's not all. High sensitivity speakers might not at present generally measure as well as plastic coned types, but they do sound livelier and more

dynamic and point the way ahead. Using 1990s materials technology, their measured performance should improve in conjunction with sound quality.

At the moment, paper cones offer a cost effective way of achieving lightness, but they don't offer an especially flat frequency response. This is why everyone and his dog rapidly switched from paper to plastic in the Seventies, when all those fancy FFTs and lasers showed clearly that plastic gave response graphs with a straighter line.

What we need now are loudspeakers that combine smooth frequency response with high sensitivity. They can and are being built, using materials more appropriate than either paper or plastic, like carbon fibre, Aerogel, fibreglass. The drive units of the nineties will rely on improved materials technology rather than a greater understanding of drive unit behaviour for their advance. They will combine good measured performance with high sensitivity and a lively sound, getting the best of both worlds. Who knows, the British and French might then even agree on something! ●



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AFFORDABLE MCs

Eric Braithwaite listens to four Moving Coil cartridges, available for Moving Magnet money.

I have been heard to say the only thing a moving magnet is good for is picking up paper clips dropped on the carpet. There is something about a moving-coil cartridge's clarity in the mid range, its depth of focus, extended treble and transient ability that for me makes using one essential.

However, it usually costs - demanding an extra head-amp, if nothing else. A reasonable compromise, it would seem, is the high-output moving-coil - of which there are three examples here - which at least allows amplifier owners to save by using the MM phono stage most amplifiers are born with.

All were run through the decent, but not esoteric MM or MC board of a Quad 44, bypassing its internal circuits direct to an Argo line-level pre-amp, stereo Alecto and ESL-63s.

The tonearm was an SME IV, with each cartridge carefully aligned, VTA checked, and adjustments to bias and tracking force made as the session went on for optimum sound. The MC reference was Ortofon's excellent MC15 Super, which sits at the top end of the price range for this group; Arcam's P77 was used as an MM cross-check



DENON DL110



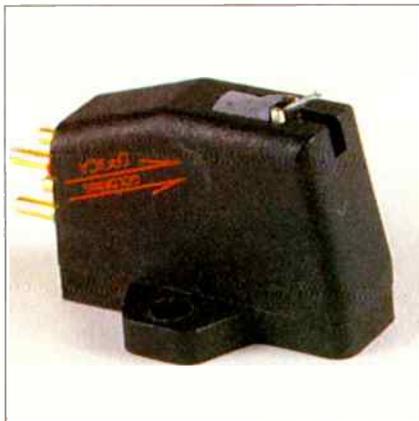
Perhaps it's because Denon provide cartridges to NHK (Japanese radio) that the Denon DL 110 is best described as having a 'broadcast' balance. Walton's 'Belshazzar's Feast' sounded like a good, spacious live broadcast, with plenty of depth, a fair degree of ambience, good tonal colour and lively dynamics - true diminuendi and crescendi.

It produced that rare thing except among high-end cartridges, the impression of true vocal inflection from the chorus in Belshazzar: James, Paul Simon and Joan Armatrading. It managed to cope with both the Walton orchestra, the delicate timbres of Vivaldi's concerto for two mandolins, plucked double bass and Dave Grusin's ensemble in 'Mountain Man' from piano right down to the tinkling of a triangle with

ease and apparent accuracy.

The upper reaches - sopranos and violin - lacked extension, and were tonally thinner than the MC15, while the bass end was a little rounded, but overall the Denon produces an excellent balance of sound, particularly well-suited to acoustic jazz. It also made more than a fair stab at perspective, managing to keep pace with rhythm and time signatures, although it was a little less adept than the MC15 in these areas.

Physically, it's a lightweight and - unless you use the metal plate provided to add mass - balancing it is tricky. I succeeded with patience and a light finger on the tracking force adjustment. Getting on for twenty, now, but still an absolute bargain.



GOLDRING EROICA

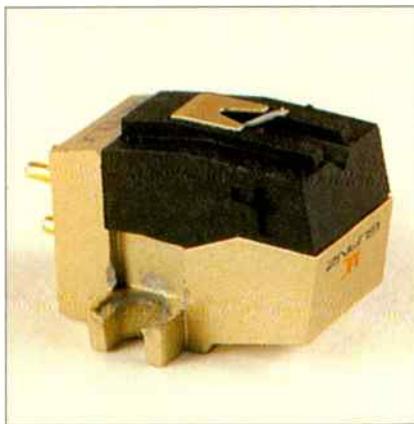
A very pleasurable affair, this, despite some anomalies. The Vivaldi sounded quite chirpy, light and fleet of foot, but a lack of tonal variety among woodwind made those instruments chirrup like sparrows rather than play quavers and semi-quavers. The two mandolins were different tonally (as they should be and as few but top-quality cartridges allow them to be), but one had a touch of the zither and the other of a ukulele, which couldn't be right.

Though the Goldring made a valiant effort at the dynamic changes in Belshazzar, it felt the strain. Violas and cellos had a rather murky tone, and while the spread of the chorus appeared pleasant enough to behold, comparison with the MC15 Super and the Denon showed it to have a slight veil in front of it.

James' 'Tonight' had more of a presence, with a forward upper-midband that drove along well, but the vocals lacked body and electric guitar had a hard, ringing sound. The percussion, while tidy in positioning, was tonally not well defined, and the double bass in Grusin's track was a bit under-fed. Cymbals, alternatively, were sharp and forward, the piano taking on aspects of both characters.

The total is more pleasurable than the individual parts of the sum would lead one to expect. If it were not that the MC15 costs little more, is more even and more controlled throughout, and both the Denon and Arcam more equitable and cheaper, the criticism would have been more muted.

Like my jokes, the old 'uns are still the best. The Denon might be a little too soft-natured for some, but its extremely even tonal temperament and splendid dynamics offer a foretaste of what higher-end MC cartridges are really about. The Glanz is only worth a second glanz (as I said, the old jokes . . .) if you have an MC stage



GLANZ GMC-10LX

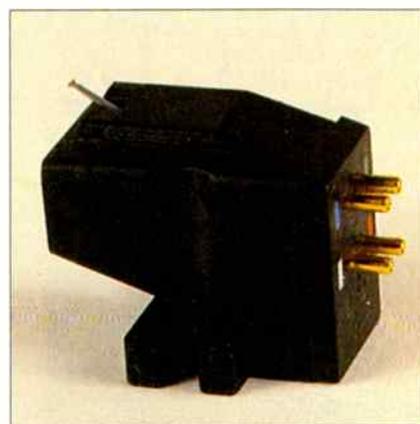
A cheerful, fast little cartridge, and rather appealing at first hearing. However, closer inspection revealed that it had feet of clay, seemingly unable to pick up a rhythm or 'play a tune'. Joan Armatrading might well have been singing 'I suppose I might as well catch a bus' in a monotone as 'I'm lucky I can walk under ladders' for all the life that track had in it. Paul Simon's 'You Can Call Me Al' lost that marvellous bass line, which here and elsewhere was 'flubby' - a cross between flabby and fluffed.

Both the Walton and the Vivaldi were somewhat featureless: rather thin and without real tonal richness in any instrument. Vocals were slim too, Paul Simon sounding like a teenager.

A bright treble - which brought percussion and cymbals forward in what was otherwise a very flat plane - gave the impression of speed and freshness, but didn't compensate for the lack of real attack. James himself on 'Tonight' needed a cough sweet to loosen his catarrhal throatiness on some notes, and treacle to stop him whining others, while when the band got busy the Glanz's stage contracted, rolling the track up into a ball between the speakers.

On the plus side, there was real detail, but there was also insufficient variety of tonal colour compared to the MC15, Denon or Arcam. The Glanz sounded - another listener commented - like a 'cheap' cartridge. And an MM at that. In fairness, an Iso gave it the injection of monkey glanz it needed. It opened up (except fore and aft) and livened up considerably, but that made it into a £100+ cartridge at a cost of another £400 . . .

which has the right tailoring to expand it. Goldring's Eroica somehow averages out most of its sins and comes up a relatively good listen, but lacks the kind of detail, clarity and forcefulness that its MM brethren now have. The Ortofon has liveliness to commend it, though only Pro-ject and Rega arms can be certainly recommended as partners. But at this



ORTOFON MC1 TURBO

Very perky and bright, was the Turbo, with a speed the others lacked and good dynamics, though like the Goldring, it had its quirks. Violas on the Vivaldi piece sounded electric, though woodwind and lower strings were large and rich. Brass rasped and tore in the Walton, and both on this recording and Joan Armatrading, there was a real taste of top-quality MC air around soloists and an enveloping ambience the others couldn't quite achieve.

Percussion tended to be somewhat muggy and undefined, though electric bass reached downwards quite sharply and electric guitar on James twanged and rified along with verve. Vocals, however were rather coloured, obscuring the bass/baritone difference in a chorus and provoking some spitching on sibilance. Harmonics on cymbals seemed cut-off, and top piano notes had a rather tinkly sound.

Paradoxically, the Ortofon produced a sensation of being very rhythmic, while at the same time not following a beat consistently, possibly something to do with a clear mid range combining with an occasionally occluded bass.

Good value in terms of liveliness, though extra cartridge nuts had to be added to balance it in an SME IV and my Koetsu arm couldn't take it at all. A Rega RB300 did (just) though there were only millimetres betwixt the counterweight and the bearing.

price, the moving-magnet Arcam P77 offered a very viable alternative with the tonal range of colour of the Denon along with reasonable dynamics, a fairly broad soundstage and a degree of airiness. Only a softer bass and more blurred imaging than these MCs stopped it trouncing the lot. Yer pays yer money...

CONCLUSION



**MEASURED PERFORMANCE
DENON DL-110**

Two features of this cartridge struck me immediately: it's light and some arms won't balance it out; the cantilever protrudes at such a steep angle that strong distortion is inevitable.

The DL-110 weighs 4.8gms. Since pickup arms commonly cannot balance out anything less than 5gms, arm compatibility needs to be checked before buying this cartridge. The benefit of low weight is better warp riding and less unwanted subsonic output.

Vertical tracking angle is determined by cantilever rake and it should be around 22degrees. To obtain good disc clearance plus low tip mass from a short cantilever, Denon have had to give the cantilever an unusually steep rake angle. Measurement showed it was well over 30degrees (the limit of our test disc). As a result, distortion on vertical modulation, which affects left and right images, measured a whopping 7%, albeit mainly second harmonic. I would expect some slight lightening of timbre on left and right images as a result of this.

Lateral distortion, which affects centre-stage (mono) images was adequately low at 0.9%, second harmonic, the sort of level that is common from cartridges.

I found the Denon tracks well at the

recommended downforce of 1.8gms, clearing around 80µm at low frequencies and around 23cms/sec rms in the midband. That's right up close to the best, so there's no problem with this aspect of performance.

Output was unusually high at 4.2mV for 5cms/sec rms tip velocity, making the DL-110 suitable for all amplifiers having an MM input, even some older noisy ones. Channel separation was satisfactory at 23dB.

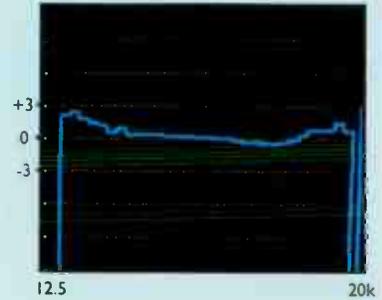
Denon have engineered a flat frequency response by effecting a clever balance. Putting a lot of turns on the coils has given the DL-110 high-ish output impedance, introducing just a little upper midband droop of the sort commonly displayed by moving magnet cartridges. This can be seen in our analysis - compare the Denon to the other cartridges. In conjunction with a well controlled tip mass resonance at 16kHz, this has served to prevent the Denon suffering too much treble lift. I'd expect to hear smooth, even treble as a result. **NK**

TEST RESULTS

Tracking force	1.8gms
Weight	4.8gms
Vertical tracking angle	>30degrees

Frequency response	15Hz-20kHz
Channel separation	23dB
Tracking ability (300Hz)	
lateral	70µm
vertical	45µm
lateral (1kHz)	23cms/sec.
Distortion (45µm)	
lateral	0.9%
vertical	7%
Output (5cms/sec rms)	4.2mV
Channel imbalance	0.6dB

Frequency Response



**MEASURED PERFORMANCE
GOLDRING EROICA**

There are two versions of the Eroica - high and low output (LX). Reviewed here is the high output version. Since to obtain more output, many more turns of wire must be used, there are significant differences between the two and, generally, low output moving coils are best, since the cantilever has to wiggle around a smaller and lighter coil. But the high output version works direct into an MM input without any form of expensive step-up device.

Our unit gave 2.7mV on both channels at 5cms/sec rms, a little more than Goldring's claimed 2.5mV, plenty enough for modern amplifiers. Moving magnet inputs are very quiet nowadays, making low cartridge output acceptable.

Channel separation was satisfactory at 26dB. Even though the cartridge rides fairly low on a disc, it has a high vertical tracking angle of around 30degrees. This resulted in 5.5% of second harmonic distortion on vertical modulation, but it was balanced by a low value of 0.8% on lateral modulation, meaning centre images suffer less distortion than left and right. These figures are fairly normal as cartridges go, putting the Eroica on par with other designs.

The Eroica tracked very well at low frequencies, due to high-ish compliance, and

in the midband, due to low tip mass. I used Goldring's recommended tracking force of 1.7gms. Good tracking gives a confident sound on musical peaks; poor tracking results in jitteriness in the sound.

Our analysis shows the cartridge has a well controlled frequency response, with the usual bass peak caused by arm mass resonance, and treble lift of around 2dB from 6kHz upward. With no upper midband droop either, this will give it a bright, clear sound, but one that should not move into overt sharpness or spittiness.

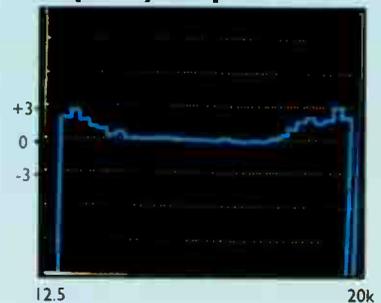
Goldring nowadays engineer their cartridges extremely well. The Eroica was thoroughly competent all round. **NK**

TEST RESULTS

Tracking force	1.7gms
Weight	5.5gms
Vertical tracking angle	>30degrees

Frequency response	15Hz-20kHz
Channel separation	26dB
Tracking ability (300Hz)	
lateral	80µm
vertical	45µm
lateral (1kHz)	24cms/sec.
Distortion (45µm)	
lateral	0.8%
vertical	5.8%
Output (5cms/sec rms)	2.7mV
Channel imbalance	0dB

Frequency Response



**MEASURED PERFORMANCE
GLANZ GMC10LX**

The GMC10LX is a normal low output moving coil cartridge, unlike the others in this group. It needs a step-up amplifier or transformer to be able to feed a moving magnet input stage (the others don't). I measured its output to be 0.7mV at 5cms/sec rms, which is on the high side as normal moving coil cartridges go. High quality low impedance types, from Ortofon and Linn for example, provide just half this output. The Glanz will make noisy budget MC input stages seem relatively quiet as a result, so it has its own benefits.

The unusual feature of this cartridge is its removable stylus assembly. The miniature coils can be clearly seen, something I always find fascinating. So can the cantilever and its hinge. Unfortunately, the hinge was not very compliant, for the cartridge needs 2gms downforce and even at this it does not track especially well by current standards, being inferior to the other three models in this respect, both at low frequencies and in the midband. I'd expect it to sound a little shaky and coarse on loud passages.

A vertical tracking angle of 28degrees produced 4.5% of distortion on vertical modulation, fairly standard figures. The

cantilever exits the carrier far back and Glanz have kept it short, to minimise tip mass and maximise rigidity. This has resulted in a high-ish vertical tracking angle and means that the stylus cannot be seen from in front when cueing. Lateral distortion measured 0.8%, putting the GMC10LX on par with other cartridges in the distortion it produces, most of it second harmonic in nature.

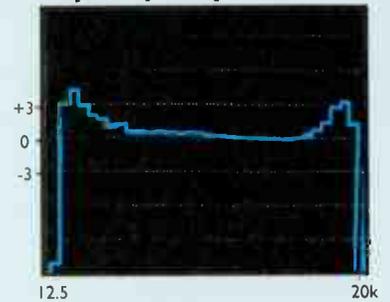
The frequency response analysis shows that this cartridge peaks up only at and above 10kHz, so it will have a slightly different treble character, possibly less obviously bright, but a little more spitty at times than the others. The Glanz displays the same lack of upper midband droop that is common to moving coil cartridges, so it should also possess the usual forward presentation. **NK**

TEST RESULTS

Tracking force	2gms
Weight	4.8gms
Vertical tracking angle	28degrees

Frequency response	15Hz-20kHz
Channel separation	25dB
Tracking ability (300Hz)	
lateral	60µm
vertical	45µm
lateral (1kHz)	15cms/sec.
Distortion (45µm)	
lateral	0.8%
vertical	4.5%
Output (5cms/sec rms)	0.7mV
Channel imbalance	0.5dB

Frequency Response



**MEASURED PERFORMANCE
ORTOFON MCI TURBO**

The Turbo is a little unusual in places. Weighing a miniscule 4.1gms, our SMEIV test arm wouldn't balance it 'as standard' and many arms may not do so. Making a cartridge light reduces arm effective mass and lessens warp output, so in theory it is a good thing, but few arms cope with anything less than 5gms, so be warned, the Turbo is very light indeed. If you are forced to use an additional weight in the headshell, as I was when testing, then the advantages of light weight are lost of course.

The Turbo was a respectable tracker at low frequencies, but very good in the midband, clearing 24cms/sec. All-in-all, it shouldn't give problems in this area. However, it may well sound spitty and fizzy with some discs, since it has a very strong treble peak in its frequency response, as the analysis shows. This hits +5dB at 16kHz, which will certainly be audible, especially if the speakers possess a peaky metal dome tweeter. The Turbo could be a liability in the wrong system, something that should be borne in mind.

Output was high at 4.4mV; the cartidge will match all amplifiers with ease. Channel separation was fine at 24dB, but lateral distortion also high at 1.6%, in spite of much tracking alignment. I expect to see no more than around 0.6%-1% from a good

cartridge, mainly second harmonic. Optimally adjusted, the Turbo produced third harmonic, suggestive of geometry errors in the generator. Another cartridge that produced third harmonic - 9% of it, no less - was the famed Decca London. It added sharpness, heard as speed and hair-trigger transients, to the sound. The Turbo may well possess some element of this in its sound.

A vertical tracking angle of 24degrees kept vertical distortion, which affects left and right images, to a low 3%. All the same, this is not a low distortion cartridge, unlike so many Ortofon's I have measured in the past, especially the silky-smooth sounding VMS Series.

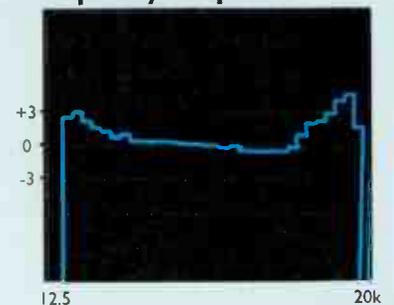
The Turbo shouts "budget". Ortofon haven't been too cautious with this cartridge and its blemishes may well make themselves known in listening. **NK**

TEST RESULTS

Tracking force	2gms
Weight	4.1gms
Vertical tracking angle	24degrees

Frequency response	15Hz-10kHz
Channel separation	24dB
Tracking ability (300Hz)	
lateral	70µm
vertical	45µm
lateral (1kHz)	23cms/sec.
Distortion (45µm)	
lateral	1.6%
vertical	3%
Output (5cms/sec rms)	4.4mV
Channel imbalance	0.3dB

Frequency Response



MOVING COIL MAGIC

Noel Keyword explains the benefits of Moving Coil cartridges.

Moving coil cartridges have always been regarded in some awe, even way back in 1959 when the Ortofon SPU reigned, a lone example of the breed. They're not a new idea by any means, and with the exception of one or two dissenters, most people prefer the sound of a moving coil cartridge to that of a moving magnet - and that includes me.

But like everything in hi-fi, moving coils vary in quality and not all of them are as wonderful as the expensive and refined MC2000. Here's a little explanatory feature on how they work, why some are superb yet others are not, and what to look for when buying.

Both moving magnet (MM) and moving coil cartridges (MC) produce a signal by the same process of 'electromagnetic induction' that is exploited in motors and generators. A magnetic flux moves through (cuts) a coil, producing a voltage proportional to the rate of change of flux.

In a moving magnet cartridge the stylus wiggles a miniature magnet, as our diagram shows, producing magnetic flux changes in the signal coils via a magnetic circuit formed by the core.

In a moving coil the stylus wiggles the coil, not the magnet. Since the coil sits in a magnetic field produced by the stationary permanent magnet, the flux again changes relative to the coil and a signal is induced into it.

The MM has more output because it has a larger coil with more turns on it. It is the easiest to make and therefore can be cheap, and it is more practical because the stylus can be removed.

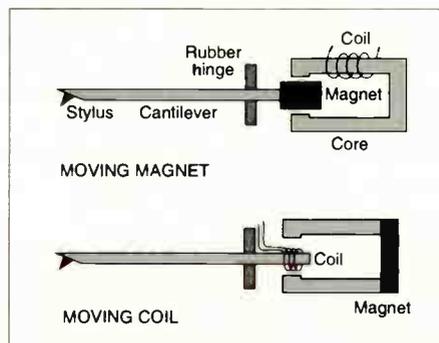
In contrast, the MC appears to make little sense at all. It must have a micro-miniature coil, and this raises many problems. Ortofon say: "the moving coil principle is not suited to mass production. Each of the coils contains between 11 and 24 turns of wire and has to be wound under a microscope. The wire is much thinner than a human hair". Because there are so few turns, output typically measures around 300µV, or 300 millionths of a volt, one-tenth that from an MM cartridge. It's so low that its amplification poses significant problems.

So a moving coil cartridge is no different in basic principle to a moving magnet - its working parts are simply arranged differently. Unfortunately, the arrangement is one that makes it expensive to produce, results in minuscule output and a stylus that

cannot be removed easily because of the signal wires. So what gives the moving coil cartridge good sound quality?

There are a number of reasons. Ortofon say they first built a cartridge like this in 1948 because it operates exactly like a record cutting head, but in reverse as it were. The notion of perfect equivalence is being cited here. The moving coil cartridge doesn't rely upon signal transmission through a magnetic circuit of permeable materials, as do MMs, but the coil directly follows the groove modulation.

A distinct measurable and audible difference comes from the low generator impedance of the MC. This can feed most loads without high frequency



generator losses occurring. Consequently, a moving coil cartridge does not have the upper midband droop of a moving magnet, so it has a brighter, clearer and more tonally balanced sound.

And finally, there's the amount of wire used. MCs use much, much less wire in their signal coils than MMs. I believe this is quite important and it is a point of distinction between high and low output types. The best sounding MC cartridges have very little wire in their coils and very low output as a result. They must be used with a super low noise preamplifier or a very high quality step-up transformer, both of which are expensive. You can expect to pay many hundreds of pounds for such cartridges, or even a thousand or so - then you've got to buy an expensive preamp!

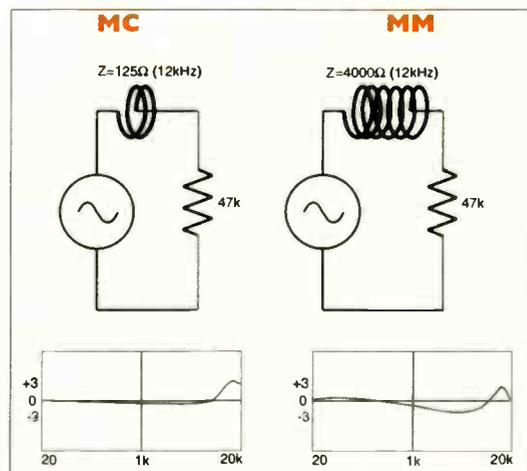
High output moving coil cartridges are a good idea, but in my experience they are a half-way house too. These cartridges have more turns of wire on their signal coils and it

does, I suspect, rob them of the sort of lucidity displayed by low output types. They commonly don't need a step up device, be it amplifier or transformer, and they also don't have the upper midband droop of MMs, as our response analyses show, making their sound clearer, brighter and more revealing of detail than moving magnet designs, yet they don't usually possess real MC magic.

Traditionally, moving coil cartridges have had in compliant cantilever hinges and poor low frequency tracking as a result. Anyone looking to preserve their record collection might find this alarming. However, modern designs have mostly overcome this, as my tests on four different models shows. Only one was a little below what was a high standard of tracking.

Whilst talking about the stylus, remember that like expensive low-output MCs, you must still return the cartridge to the manufacturer to get the stylus replaced, although there are a few exceptions with a user removable stylus.

Anyone looking to upgrade to a high output moving coil should choose carefully and bear in mind that a modern low noise amplifier, plus a quality turntable with a good, rigid tonearm, like a Rega or SME, are really required to get the full benefit of moving coil sound quality. But it is a benefit worth having, for these cartridges can offer a significant step up in sound quality from LP, without demanding the extra expense of an esoteric preamp like traditional low-output types ●



The low generator impedance of an MC avoids the mid range droop of MMs.

American Convert



Dominic Todd auditions an interesting new CD converter from across the water.

"Dedicated to technical virtuosity and beauty of sound". That's the rather flowery prose that accompanies the Bel Canto Aida CD converter - a new product from the States - and it is set to enter the rather crowded high end (£1500-£2000) digital-to-analogue converter market in Britain.

At this price we have a right to expect something rather special, as DACs such as the superb DPA PDM I Series III, with its master clock and sync-lock system to remove jitter, and Pink Triangle Da Capo with its discrete one-bit converter, offer near state-of-the-art performance for a good deal less money (£1280 and £1450 respectively). So the Bel Canto sails into fiercely contested waters, a small ocean in which considerable design expertise and experience have pitched top quality products at, relatively speaking, rock bottom prices.

At the heart of the machine lies a Crystal Delta-Sigma D/A converter. Care has been taken in its implementation, something that can make all the difference to a converter of any price. The high quality power supply feeds each channel individually. The DAC is placed in an environment with isolated digital and analog supply regulators and a high speed output buffer. This output buffer allows the analog circuitry to operate in Class-A mode under all load conditions. Output comes via conventional gold phono sockets or a set of more unusual balanced XLRs, to connect into a pre-amp with similar inputs.

Also of note is the fact that the Aida does without the ubiquitous Toslink optical link. The reason given being that such is the performance of the uniquely

designed coaxial inputs (and outputs) that fibre optic connectors are simply unnecessary.

Finally, the Aida uses special circuitry around the analog D/A clock to reduce noise and jitter levels. This should have the effect of producing a sound quality that's both smooth and pure.

The physical appearance of this converter is somewhat conservative. When paying nearly two thousand pounds one expects a little more style than a square black box with a knob on it. The only stylistic feature to save this product from total anonymity - and a small one at that - is stepped bevelling of the front panel, at the top left hand corner. The opposition, namely Da Capo, DPA PDM I Series III and even the much cheaper Dacula prove that the styling of a DAC needn't be dull, even though it may remain tasteful and restrained.

To test whether Bel Canto's attention to detail really does pay off in terms of sound quality and whether or not the converter lives up to its hype, I pitched it against a long term World favourite, the DPA PDM I Series III. This is a tough test, since the DPA converter is in highly developed form: it possesses surface

mount components, custom designed output line drivers rather than off-the-shelf chips, sync locking to eliminate jitter and timing errors, and multiple independent power supplies to feed the various sections, especially the final TDA-1547 one-bit converter.

With John Lee Hooker's "Boom Boom" album the vocals were clearly located towards the centre of the sound stage, but seemed to lack some of the spark that had been heard using the DPA. The balance was certainly smooth and neutral, yet it missed out on the "foot tapping" factor, and the atmosphere conveyed by the DPA.

Eric Clapton's "Running on faith", from the "Journeyman" album revealed the same problem. Whilst the Aida maintained a tight grip on the music, Clapton's guitar seemed to be straining at



Component quality is very high.

the leash, just waiting to burst out of the speakers, rather than integrated into the mix. However, a good sense of control did endow the DAC with a firm grip on vocals, which meant plenty of body to Clapton's voice and imaging which placed him firmly in the sound stage - at the right height, too, not as though he was singing on his knees!

Mary Black's, "Song for Ireland" was portrayed with fine articulation in her voice, the Aida showing its abilities in this direction once more. Although the bass didn't go quite as low as that from the DPA, it was well integrated with the mid range and never became obtrusive. Her vocals were reproduced smoothly and, even by the testing standards of Mary Black, the Aida proved well capable of handling her powerful and occasionally forceful nature, without lapsing into sibilance.

I approached "Open book," by the Lemon Trees with caution after once walking out of a live concert of theirs. Yet on the recorded medium the quality was remarkably good. Although the Bel Canto lacked the sheer presence offered by the DPA, it did prove more refined, flattering vocals by evening out rough edges. The sound stage was flatter than that from the

DPA, though, lacking the sense of realism it gave to individual instruments.

Where the Aida did come into its own was with classical music. Violinist Hideko Udagawa playing Max Bruch *Allegro moderato* in G minor Op.26, provided the first opportunity for it to shine. The violin never sounded grainy or coarse and it came across as sweeter in tone than on the DPA, although not

“Hideko Udagawa playing Max Bruch Allegro moderato in G minor Op.26, provided the first opportunity for it to shine.”

necessarily more natural.

This sweetness came somewhat at the expense of the rest of the orchestra, though. The scale of the London Symphony Orchestra seemed compressed, despite being well defined.

"The song is you" from the Chesky jazz test disc was less successful. There was a marked softening of bass and rather lack-lustre drums. The violin could sound a little recessed at times, and overall there was a feeling of reduced spaciousness.

Although the Bel Canto Aida has many of the elements of a fine DAC, it is simply over priced against more

established convertors. The sound is refined in the sense of an Edwardian accent: polite and accurate but rather lacking in any form of "grit". In this case, not grit in the sense of "graininess", but in the sense of a listener's involvement. This can be related to a number of factors. The first is that the Bel Canto often seemed veiled, and although there was reasonable depth to the sound stage, the

listener was given the impression that the sound was trying to escape from the speakers. This came over as a lack of width in the sound stage, although within it the instruments and vocals were well positioned.

A high price, unimaginative styling, and strong competition all serve to erode the attractiveness of the Bel Canto Aida. As much as I enjoyed its strengths, its sound also has some idiosyncrasies that need attention. With a little more development it might then start to approach established market leaders, something it really cannot manage at present ●

BEL CANTO ADIA DAC \$1,900
Bel Canto Design Ltd.,
P.O.Box 396,
Excelsior, MN 55331, USA.
Tel: (612) 474 3718

MEASURED PERFORMANCE

The Bel Canto Aida DAC is built around the increasingly popular Crystal CS4328 convertor chip. This device incorporates the necessary analogue filters, so it is a reasonably simple chip to use. The rest of the components are all high grade, including polypropylene capacitors, Schaffner mains input filter and an R-core transformer. This could prove interesting, perhaps combining the musicality of the Crystal chip with the clarity of polypropylene capacitors. Only subjective tests can tell.

The frequency response is very flat throughout the majority of the audio band with just a small lift above 10kHz. This will add some brightness to the sound which may be perceived as extra clarity.

Distortion was very low at -6dB music level off disc and at -30dB, which represents typical music signal. As our distortion analysis shows, no harmonics are visible above the noise floor, so I would expect a clean and smooth sound as a result. Distortion rises a little at -60dB to 0.65%, the best convertors can reach down as low as 0.35%, but this figure still gives a good dynamic range of 104dB.

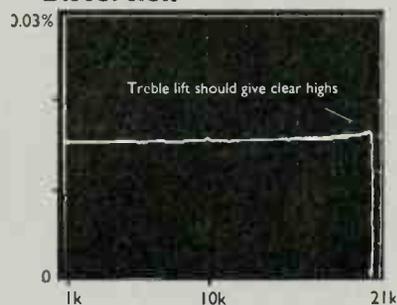
Elsewhere there is little to comment on; all figures are reasonable, but

unexceptional. The only area of concern is the very low output of 1.38V. This is nearly 1.5V lower than high output British DACs and the Aida could usefully do with at least 0.5V more to allow extra headroom for passive pre-amps and to give it a better edge in comparative demonstrations. **DB**

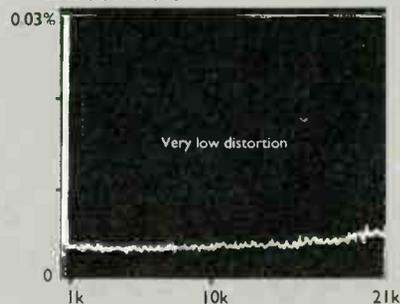
TEST RESULTS

Frequency response	4Hz-21.25kHz	
Distortion %		
-6dB	0.004	0.004
-30dB	0.006	0.006
-60dB	0.65	0.65
-90dB	31.1	28.8
-90dB dithered	6.1	4.6
Separation dB	left	right
1kHz	111	110
20kHz	89	91
Noise		-107dB
with emphasis		-107dB
Dynamic range		102dB
Output		1.38V

Distortion



Distortion



D I V A

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Pure Cables

Ortofon's new range of three cables offer superb performance at a reasonable price.

Dominic Todd lends an ear.

Ortofon has not been a name associated with loudspeaker cable. In the past they've been best known for their fine range of cartridges and an avid commitment to vinyl, typified by slogans such as "music is analogue". Now that even the most die hard vinyl enthusiasts are purchasing compact disc players, because there simply isn't enough produced on LP any more, Ortofon are having to branch out. Hence the introduction of three speaker cables.

The range capitalises on traditional Ortofon strengths. High-conductivity, 99.9999% pure copper cable, derived from the MC thousand range of cartridges, is used throughout all three cables. For the really demanding, Ortofon promise a cable of 99.999999% purity in the near future!

SPK100

The range kicks off with the SPK100. This is the lead-in model, and sells for £2.50 per metre. For that you get a slim and particularly flat cable, insulated with an off-white PVC sleeve. Each conductor consists of twin, twisted bundles, each with 130 (260 total) oxygen free copper strands. Despite being very unobtrusive and flexible, a cross sectional area of 1mm isn't too bad. However, this is only a budget cable of modest proportions, and in some ways the sound reflects this. The overall balance is rather lean (not as lean as some solid cores can be, though) and bass light. Other than that, though, it scores well. Smooth vocals and a nicely integrated treble make it an easy going cable, which avoids the slight harshness of the cheaper 79 strand most systems start with, yet still offering plenty of detail. There is some confusion in the midrange, but this is being very critical for the price.

An important feature of a cable at this price is that it should fit in with a wide variety of budget systems. This the SPK100 clearly succeeds at, promoting a well integrated and musical sound in most. This is clearly not a super-charged budget cable to take on DPA, then, but a good honest effort that will suit budget systems and high frequency bi-wiring runs. I also know for a fact that its physical and sonic pretensions deem it a particularly good cable for car audio!

SPK200

Ortofon's SPK200 finds itself in the middle of the range. It comes in a rather "middle of the road" grey PVC, and has four

conductors lending itself to bi-wiring. Two of the conductors are identical to the SPK100, that is to say, twin bundles with a cross sectional area of 1mm.

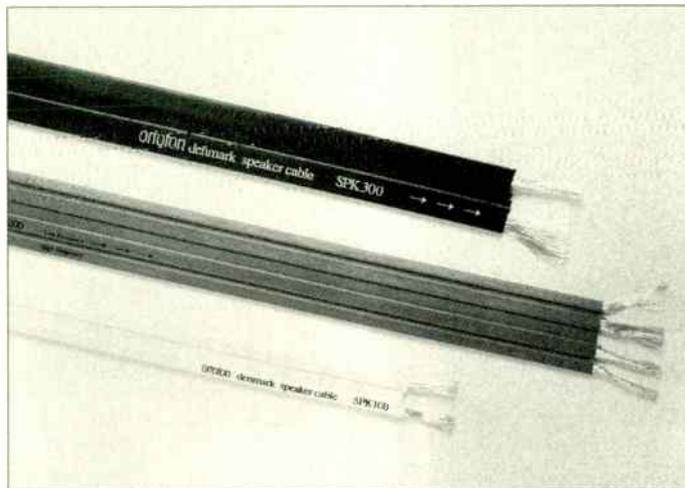
These conductors are designed to be connected to the treble units, which don't require such high power, and thus, thick cable. The bass units are fed by a 50% thicker cable. This consists of three twisted bundles, making a total cross sectional area of 1.5mm. Alternatively you could twist the four cores into two and have a heavier cable with a cross section of 2.5mm!

Sound quality improves over the SPK100 through bi-wiring and the thicker conductors. Essentially the sound is much like its cheaper brother. Where it differs is in offering noticeably better separation of instruments and a deeper more solid bass. It still lacks the clarity of the best solid cores and the sheer presence of thicker multistrands, yet strikes a fine balance none the less. In fact for well sorted systems this is one of the most neutral cables you can find, adding very little of its own character to the sound.

Again, it's another system friendly cable, and at £5 per metre comes recommended for those looking to bi-wire with a high quality cable, and avoiding the inevitable spaghetti tangle.

SPK300

Top of the heap is the SPK300. It is a fat multistrand cable whose dimensions are similar to that of the old QED 200. There are two seven-cored conductors with a total cross sectional area of 1.65mm, and each individual strand is insulated with a clear enamel. The idea here is that distortion between individual conductors, known as the diode-effect, is reduced and the maximum surface area of the copper is utilized. In addition oxidation of the very pure copper is restricted. Something to remember if you do buy this cable, though, is that attaching this cable directly to terminals damages the enamel. A set of banana plugs and powerful soldering iron are a must.



Enamel or no enamel, the SPK300 faces tough competition around the £7.50 per metre mark. What is most notable when listening to the '300 is its uncanny smoothness. Uncanny because big multistrand cables aren't often noted for smoothness (the preserve of solid copper and Silver cables). A weighty bass is usually the hallmark of such cables, and the Ortofon didn't prove the exception here. My only criticism of the bass performance was a tendency for certain notes to retire just a little later than they should. This is more of a problem on speakers such as the B&W 610/620, which can wallow, than something like the new Tannoy D100s with their wickedly fast and tight bass.

The midrange always remained natural and yet detailed enough not to simply gloss over any subtleties in the music. Vocals were well projected without being overblown and dominating. High frequencies were handled with equal proficiency. The lack of grain and sibilance often lulled me into thinking I was listening to a solid core speaker cable. Of course no speaker cable is perfect, especially one costing around £10/m, and in some systems the '300 did lack a little vitality and sparkle.

Considering my usual preference for solid core cables I must admit to being pleasantly surprised by the beefy SPK300. My only reservation is that the SPK200 offers 95% of the performance (in bi-wired mode) at a lower price. Used in a system which is a touch lightweight or bright sounding it could prove the ideal choice, and along with other cables at this price proves that spending more really does place one at the mercy of the law of diminishing returns ●

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A New Direction

Systemdek, best known for turntables, have tried their hand at a new range of loudspeakers. Dominic Baker enjoys listening to the new System 931s.

fabric dome, again from SEAS, and both are connected to a high quality crossover which can be split for bi-wiring.

I found the 931s are very polite sounding loudspeakers. They have manners - and they adhere to them at all times. These speakers do not exaggerate sibilance or harshness in the treble and they don't shout in the midband, so much as raise their voice in an even and controlled manner. They are also exceptionally well groomed, sounding smooth and tidy from treble down to bass, with no ruffles or creases.

This gives the 931s an engaging and coherent presentation which is a joy to listen to after cruder 'speakers; they play music with an evenness that few can match, in my view. With my current favourite album - POD by The Breeders - they sounded full and warm, but detailed and lively at the same time. The midband, although clean and well focused, could

in their lower registers. They didn't possess real deep-bass growl, but there was plenty of upper-bass punch and it gave them a solid, rhythmic foundation to build upon.

And at the other end of the spectrum the treble came over as sweet and open, with plenty of insight: even the crashing cymbals on 'Iris' couldn't provoke an unpleasant squeak out of the small fabric dome tweeter.

Systemdek's 931s are not an overly dynamic loudspeaker, yet all the same they have a real ability to rock along if asked. With Belly's 'Full Moon, Empty Heart' they obediently opened out to welcome Tanya Donally's holographic vocals - and delivered a good kick in the bass too. The midrange was excellent, capable of revealing emotion and character in even the most complex of voices.

Although not specifically aimed at that market, the 931s are one of the very best LS3/5a pretenders around. Ignore the lower price, spend the money saved on a high quality source and amplifier and these little gems will really sing. They are coherent, involving and will give hours of interesting and enjoyable listening ●



Systemdek are best known for their range of excellent turntables, but recently they have found a new path to explore. No, they haven't given up hope and gone down the digital road just yet, but their new range of loudspeakers should certainly give them a different direction to travel in.

At a touch under £300, the System 931s are the least expensive in a new range of three models, with more on the way, we are promised. They are a miniature, LS3/5a size, reflex-loaded stand-mounter attractively styled to look a little different from the crowd. In fact, something about them reminds me of Mission, perhaps the modern blend of black ash and grey, plus Nextel-type finished side panels. Light ash and walnut are also available.

The drive units are both well made, high quality devices, the midrange unit being the same SEAS driver found in many more costly designs. The tweeter is a small

become a touch plasticky at times, adding a little of its own character to Kim Deal's sharply etched vocals, but remained open and deliciously smooth at all times. But these speakers are also able to push a performance out and away from the cabinet, giving a sound uncoloured by boxiness, yet without a midband 'shout' either.

Their politeness revealed itself on the grunge guitar through 'Happiness is a Warm Gun' which was not quite as coarse or grating as it should have been. And again, on P J Harvey's 'Rid of Me' some of the rasp in her voice was politely smoothed over. This is only a small blemish on an otherwise excellent midrange performance, but classical music listeners may well notice a slight thickening or warmth on strings in particular.

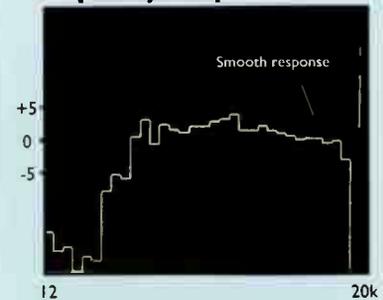
The 931s had excellent bass too. Used a couple of feet from rear and side walls, sitting on heavy Target stands, they had plenty of punch, sounding full and balanced

MEASURED PERFORMANCE

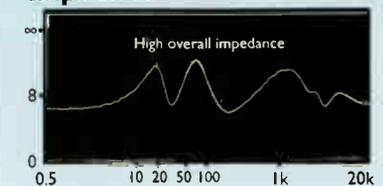
Systemdek's 931 loudspeakers have a smooth and well engineered frequency response. It is because the tweeter integrates beautifully with the midrange unit that the crossover point is impossible to spot and the response is so flat across the upper midband. However, it peaks up in the middle, at around 1kHz, a characteristic that will tend to push vocals forwards to give an out-of-box sound. The bass is quite well extended for the cabinet size, but it won't make the earth tremor.

The 931s have a high overall impedance of 12Ω and an impedance curve that stays above 8Ω over most of the audio range. This means they will not take much current from an amplifier. I measured 85dB at 1m for a nominal watt input (2.83V), which is about average sensitivity and acceptable for their compact size. **DB**

Frequency Response



Impedance



TRIMMING TAPE



NAD's new 602 cassette deck features Play Trim to get a better balanced sound from tape; Noel Keyword investigates.

How many British hi-fi manufacturers produce cassette decks? You can count them on the fingers of one hand, but two digits in this case aren't a Churchillian gesture aimed at the cassette. Both Arcam and NAD struggle to make the most of the medium. I use the word 'struggle' because making a cassette deck ain't easy and, worse, it isn't very profitable either.

I'd like to build a valve Walkman, possibly to feature in the DIY Supplement. Believe it or not, the valves and battery are not a problem. The cost of a transport and head from Japan, plus a Dolby licence were. They preclude small scale manufacture. They also force any company making a cassette deck to adhere to the most stringent build budget and mass produce on a large scale for the widest possible market. Those prerequisites set the scene for any company contemplating cassette deck manufacture.

This is all to explain why NAD's 602 cassette deck isn't in the same league as their new tuner, which we recently praised so much. The compromises show, which is unfortunate. Whilst the fascia looks smart enough in NAD dark-grey, with gently bevelled edges and rounded corners, plus a neat, symmetrical control layout, the small, low-resolution LED record-level display and the mechanical tape counter both shout "budget".

You'll not find variable bias for tape matching either, although this is partially compensated for by the inclusion of Play Trim which, although it performs a quite different function, can tonally alter recordings during playback to compensate,

at least in some small measure, for imbalances due to tape mismatching. Bias adjusters are clearly marked internally, so the 602 can be tweaked to match individual tapes, but this isn't a job for anyone lacking experience and test equipment.

The 602's case sounds clunky and insubstantial, something NAD may have been able to suppress by the use of damping pads. The head platform makes a strong clunk every time it pulls in or out during Play or Stop commands, but otherwise the deck works smoothly enough, if not silently.

Switching on lights up a solitary green LED. Neither the counter or tape compartment are illuminated, but the record level display has two rows of green LEDs covering a -20dB to 0dB range that light when recording or playing. Above 0dB, which is set low (Dolby flux) to discourage over-recording and head overload, there are yellow +3dB and red +6dB LEDs. The latter correctly indicate maximum I found in tests, at least with ferric and chrome tapes.

The 602 is allergic to metals; they are best avoided, unless record level is kept down to 0dB maximum on peaks and Dolby C engaged to counteract hiss. The head has a poor overload margin when faced with the high bias and flux density necessary for metal tapes. For example, bass distortion with TDK MA measured 7% at 0dB, but with TDK AR ferric tape just 2%, so the latter will give cleaner bass. Perhaps it's realistic to expect a budget deck like this to be used mainly with ferrics and chromes in any case.

Facilities are sparse, but adequate. NAD have fitted Dolby B and C noise reduction systems, plus Dolby HX Pro treble overload prevention. New to NAD decks is automatic tape type selection, making it unnecessary to manually select ferric, chrome or metal before recording. Absent are a search system and a zero-stop (memory), making tape search a bit of a haphazard business with pre-recordeds.

It is for pre-recordeds that Play Trim has been designed. It boosts or cuts their treble much like a treble tone control, but being placed before the Dolby system it also improves Dolby tracking accuracy. The only other manufacturer to offer this useful facility is Yamaha. Play Trim is the only method by which pre-recordeds can be tamed. Many are dull, due to over-recording and self-erasure, or recorded azimuth error - or both. Play Trim will boost their treble by up to +3.5dB at 10kHz, plenty enough to banish dullness except in the most severe cases. For tapes that are compensated during mastering to have excessive treble so they sound clear on budget players, Play Trim can apply treble cut.

SOUND QUALITY

Replay sound quality with pre-recorded tapes was tidy and correct, in so far as it went. By this I mean that the 602 was bass light and lacked bottom end punch, which rather limited any sense of scale in music. Well recorded tapes that I know from experience to be tonally balanced on my own Nakamichi ZX-9, like Madonna's 'True Blue', came over as a little thin and reedy. Fine treble detail was there - the

trinking of percussion was nicely resolved - but the rhythm section was out on holiday, and whilst Madonna herself was discernible, she was not in too clear a focus. I guessed the strong bass line behind Tina Turner's slyly 'Undercover Agent for the Blues' would restore the balance - and it did, so some tapes come across well and when they do, the 602 sounds impressive.

A lack of grip on tempo characterises budget tape transports and it was present with the 602, but this is to be expected from any deck at the price. At least, there's no overt wow. I was also aware of some flattening of dynamic contrasts, probably due to the head working at its magnetic limit (i.e. close to saturation). This was in contrast to the ZX-9 though, against which most cassette decks turn to dust. In summary, the 602 does a good job with pre-recorded tapes, but I'm sure that even earlier NADs have sounded bialsier.

Recordings on TDK MA metal tape were forward in the midrange, which pushed vocalists up-front, but a little de-emphasised in the treble and bass. This is not to say there was no treble or bass, just that it appeared recessed. In truth, low bass was missing, giving what remained a tight, fast, but light punch. Recording to make the +3 lights flicker on peaks, vocals in particular sounded somewhat coarse and edgy. The 602 possesses no special merit with metals I'm afraid to say.

As expected, the sound with TDK AR ferric tape was relaxed and smooth in contrast to that from MA, with fuller bass and a clearer, more refined midband. However, treble differentiation was limited and upper treble quite obviously missing. The twang of the close-mike'd strings of Tracey Chapman's acoustic guitar were represented rather than reproduced. There was no sparkle to the treble either; it was lifeless.

I got the best out of this deck with Maxell XL-IIIS chrome bias tape. It combined most, if not all of the smoothness of AR across the midband with sweeter, better extended treble. Only down at low frequencies was I aware of light bass. Otherwise, the 602 produced respectable recordings with XL-IIIS, producing a tidy sound, providing record level was not pushed up above 0dB except on occasional peaks.

Although not possessing wonderful performance figures, the transport works well enough to support critical piano recordings. It wows cyclically at a low rate, an effect that is subjectively innocuous in compansion to the speed jerking of other transports, which produces 'cracked pitch'. I listened easily through Valdo Perlemuter playing Chopin Nocturne Opus 48 No.1. The 602 sounded serene in its ability to support sustained notes without wavering or sudden pitching changing. Piano lovers need not shy away from this one.

CONCLUSION

NAD have struggled with the 602 and I have to say that the compromises show. It isn't easy to produce a good cassette deck,

but NAD, I know, have all the knowledge and ability to do so. In this case though, budget restraints have been too severe: the head is poor.

And, to be frank, NAD have missed a trick as well. Had they put more bass boost into the replay amplifiers, the 602 would have sounded less needy and better balanced. Nakamichi latched onto this trick many years ago; NAD need to consider it. This 602 put up a respectable

performance, especially with pre-recorded tapes, and for the money it offers better value than most.

NAD 602 £200
NAD Marketing Ltd.,
Adastra House,
401-405 Nether Street,
London N3 1QG
Tel. 081 - 343 1804

MEASURED PERFORMANCE

The 602 suffers from what is obviously a limited manufacturing budget. Its head doesn't get more than +1dB signal level onto metal tape in the midband, so recordings will be hissy unless Dolby C is used. The head also overloads strongly at low frequencies, which generally results in wallowing, indistinct bass. I measured no less than 14% distortion at 40Hz, 0dB, where around 3% is more common. Head overload tests (MOLs and SATs) showed that the 602 works best with quality ferrics like TDK AR, where midband overload (MOL315) and treble overload (SAT10k) ceilings were relatively high at +6dB/-4.5dB. So this is a deck - potentially - for those who don't want to spend large sums on quality metal tapes, or even chromes, because it works well with ferrics.

Whilst the head overloaded easily at high recording levels, it gave a reasonably flat frequency response with standard (IEC Primary Reference) tapes, as the analysis with metal tape shows. Much the same result was given with ferrics and chromes, some bass lift and treble fall being evident. The upper frequency limit was 15kHz with all three tape types; cassette decks commonly reach 20kHz these days. The head peaked at 40Hz and rolled off at lower frequencies, so deep bass is out too.

The replay frequency response was flat right up to 20kHz, allowing the 602 to replay pre-recorded tapes with correct tonal balance and less of the dullness and muffling that is so common with them. A further aid is Play Trim, which lifts or lowers treble level by 3dB ahead of the Dolby circuits, to correct tonal balance of pre-recorded tapes and ensure correct Dolby tracking. This is a good deck for anyone with a valued tape collection.

The transport worked well enough. It had some flutter, but reasonably stable basic speed and not too much wow (0.08%) in consequence. Some pitch "indecision" is likely to be detectable, but the deck should not overtly wow.

Basic hiss and hum levels were low all round, as expected from NAD. The problem with making cassette decks is that all the most expensive parts are mechanical and made in Japan, which leaves little leeway for companies like NAD to match or surpass standard Japanese product. The 602 comes well set up and with good electronics, but it is compromised by its head in particular, and

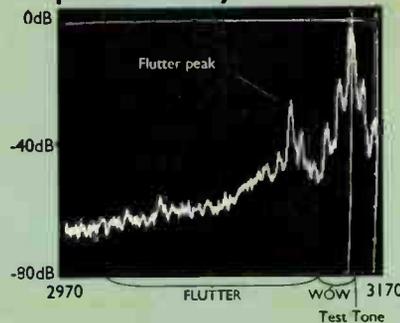
few people will appreciate the mechanical tape counter, but at least it doesn't lose its count when power is switched off. This deck replays pre-recorded tapes well and makes good recordings onto ferric tape, but otherwise it is none to strong. **NK**

TEST RESULTS

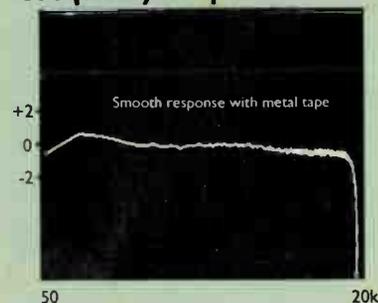
REPLAY (pre-recorded tapes)
 Frequency response (-2dB) 35Hz-20kHz
 Speed accuracy +0.4%
 Hiss (70uS, Dolby out) -61dB

RECORDING (blank tapes)
 Frequency response (IEC Primary Refs.)
 ferric (IECI) 35Hz-15kHz
 chrome (IECII) 35Hz-15kHz
 metal (IECIV) 35Hz-15kHz
 Separation (1kHz) -41dB
 Distortion (315H) 1.5%
 Hiss (70uS, Dolby out) -56dB
 Speed variations (DIN total) 0.08%
 Flutter energy (3-3.13kHz) -26dB
 MOL/SAT (IEC Refs) 315/10k
 IEC I (ferric) 4dB/-4.5dB
 IECII (chrome) 3dB/-6.5dB
 IECIV (metal) 1dB/+1dB

Speed Stability

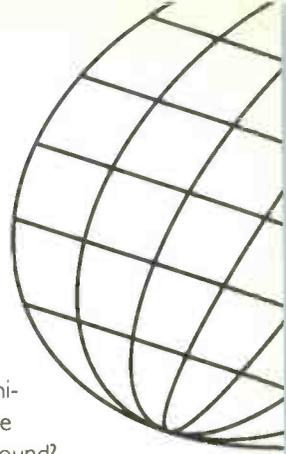


Frequency Response





World



VINTAGE TRANSDUCER

The first thing to say is that I enjoy your magazine very much, especially because you are interested in hi-fi old or new and not just the latest products. I especially enjoyed Haden Boardman's article about Garrard 301/401 turntables, being a Bastin 301 user myself.

There seems to be a widely unacknowledged tendency to look at high quality equipment from thirty years ago selectively as if saying to oneself "okay they made good amps and turntables back then, but that must be all". As if the qualities of Garrards, Leaks etc. were some kind of fluke and other elements of the vintage equipment chain especially at the transducer ends must be no good.

I held onto a prejudice like this myself, that is until recently when I bought in pristine new condition an old Ortofon SPU moving coil cartridge. This huge, ungainly

looking device was first produced in 1958. It tracks at 4 grams and comes in a monstrous bakelite headshell with its own built-in step-up transformer. The whole thing weighs in at 32 grams, making it about three or four times heavier than most modern cartridges.

I screwed it into the end of my SME 3012 SII, added an extra counter weight from a 3009 and extra outrider on the tracking weight arm and sceptically sat back expecting a heavy, undefined and flat sound.

Wrong! All I can say is that although I have never heard an lo or a Lyra, they would have to be very good indeed to better it. The SPU seems to combine qualities that are mutually opposed; it is very dynamic and honey smooth. It is very analytical, yet music flows from it in such a way that it is quite addictive. Compared to my state-of-the-art £350 moving magnet, the SPU is streets ahead, making the latter sound dull, rough,

and closed in in terms of stereo image. Perhaps more remarkable, is that it tracks better too. Where the other obscured very high energy detail, the Ortofon sails through. Not bad for something that looks like it belongs on the record player side of a radiogram.

It appears as usual that Japanese audiophiles have known all about the SPU for years and that Ortofon still produces the SPU mainly for the Oriental market. This leads me to ask the same old questions again: where has audio gone in the last thirty years? Why couldn't we have

identified hi-fi greats the first time round?

Now that I've discovered what an old cartridge can do, I won't sneer at the idea of old Tannoys or original Quad ESLs ever again.

Thanks again for not being swayed by hi-fi trends.

**Gerald Sartin
Paris,
France.**

P.S. You had a letter a while ago saying that the only way to play a 16 inch radio transcription was with a Garrard SME 12 inch combination. A collector

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INTERCONNECT CABLES

(1 metre pair)

The writer of the most interesting or funniest letter will receive a free set of Hi-Fi World's silver plated copper interconnect cables, worth £69.95.



Letter of

A LOVE-HATE RELATIONSHIP

I have been reading Hi-Fi World down here in Oz for about 12 months and felt I would like to contribute a creative letter on my love of music that other readers could identify with.

Every audiophile and music lover will no doubt have musical moments they treasure and others they loathe. The following article is an attempt to capture concisely in writing some of these moments.

DON'T YOU JUST LOVE:

Being in one of the musically receptive moods. Turning the TV off and the hi-fi on. The feel of an LP in your hand. Admiring your hi-fi system

sitting in the corner.

Turning the lights down and the volume up.

Droling over expensive high end equipment that you cannot possibly afford. Discovering a new musician on record or CD.

Hearing an improvement in the sound of your system after a do-it-yourself tweak. Reading discriminating hi-fi magazines.

Wine, an open fire, a friend and your favourite music. Sorting through your record collection.

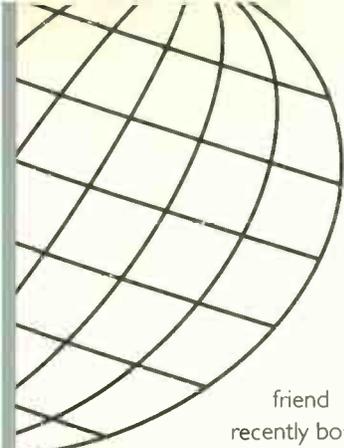
The family goes out for the evening and you can turn the volume up.

Meeting someone who appreciates "your type of music".

A long drive at night with the volume turned up full.

Finding that record that you have been searching for

Send your letters to Hi-Fi World Letter Page,



writes

friend
recently bought
what is the only
purpose-built 16 inch plattered
turntable I have seen. It is a
German EMT 927 broadcast
turntable built in the early
1950s. It has an Ortofon 12
inch arm and includes its own
valve phono pre-amp.

Hmmm! I would beg to differ,
I'm afraid to say. In my view,
not everything from the past
is wonderful and the Ortofon
SPU doesn't change it. I once
owned one, given to me by
Ortofon, and yes, it sounds
good but its tip resonates at
around 10kHz, measurement

showed, and eventually it
started to damage my
records, putting in a fizzing
sound, a sign of high
frequency mistracking. The
Decca London cartridge also
has an amazing sound, but it
is contrived and it chews
records. Knowing this (we
have the test equipment to
tell us), we could not blindly
recommend such items to
readers.

I have personally bought,
owned and repaired a lot of
vintage equipment - and I've
also tested most of it. By
modern standards, a lot was
poorly made, not because the
manufacturers of the time

were incompetent skinflints,
but because manufacturing
economics, disposable
incomes and expectations
were very different in the
past, as was component
quality. I have to say that I'm
an engineer, not a romantic. I
do love some of yesteryear's
engineering - the Garrard
401 is a masterpiece of
casting, for example, but
equally much of it wasn't so
clever by today's standards.
NK

ATTRACTING RIVAL'S READERS

I have bought all five hi-fi
magazines for 18 months and I
like Hi-Fi World most. It is a
good read, as you put it,
especially when the latest
tweaks and high-end
extravagances over-excite
your jaded contributors. It is
also best value for money, so I
am glad your circulation has
increased, but I noticed you
did not reveal your market
share.

Your survey last year of
readers' preferences would
have told you nothing about
the preferences of your rivals'
readers. You might want to
attract the best of them too. If
so, my own observations may
interest you.

So you know where I am
coming from I will say that I
am a relative novice who
intends to put together a
goodish system and then just
sit back and listen. It is not
only 'the ones who buy a
budget midi-system for £600'
who want to 'then spend no
more for the next 5 years',
and the final sentence of DB's
sub-editorial (11/93) ain't
necessarily so.

Hi-fi does not have to be a
hobby, it may be only the
means to an end: the greater
enjoyment of music. Non-

hobbyists might be short-term
subscribers but there could be
a lot of us at any time, just as
most people who ride on the
Circle Line get off when they
reach their destination.

It is good that DIY
enthusiasts have found their
niche in your pages. Though
not of that ilk I must say that
your output for them, added
to your replies to readers'
queries, suggests you guys
have a wide-ranging technical
edge over your rivals. That is
why I am bringing my queries
to Hi-Fi World (in a separate
letter).

Apart from a good query
service and juicy prize
competitions (preferably not
run to feed computerised
mailing lists) the major
mainstream interest is
equipment reviews. Here I
probably disagree with you. It
depends what you mean by
'excessive' concentration on
new product coverage and
reviews.

Whether reviews are of
individual products or groups I
do not care much, as long as
groups are not stuffed with
too many turkeys, reviewers
have time to do the job
properly, and the equipment's
merits and faults are duly
compared with those of
comparable products.
Auditioning prospective
purchases can be time-
consuming, the short list needs
to be right, and that requires
provisional answers to 'how
does it compare?'

By and large I prefer your
reviews to those of, say, Hi-Fi
Choice. It likes to stress the
objectivity of its testing
method (blind listening by a
panel) but I suspect objectivity
suffers through comparison
with the product previously
auditioned rather than a
constant reference, and for me ▶▶

the Month

years in record shops for.

DON'T YOU JUST HATE:

Reading a bad review of
equipment you have just
bought.

Paying full price for a record
and then finding it in the
discount bin of another shop.
When a musician that you
"discovered" becomes
popular and well known.
The cat clawing your speaker
grills.

Friends who insist that you
comment on their new
equipment which you think
sounds terrible.

The high price of imported
hi fi equipment.

Classical music snobs.

Rude and pushy hi-fi
salesmen.

People who say that all
equipment sounds the same.

Talking to people with loud,

unpleasant music in the
background.

Acoustic feedback.

Warped and buckled records.
People who expect the best
hi-fi gear but don't want to
spend any money.

Outrageous and deceiving hi-
fi advertisements.

The buzz of fluorescent lights
and the refrigerator when
you are listening to your
music.

Well there you are - some of
my pet musical loves and
hates. Do some sound
familiar?

Ian Fetting
Victoria,
Australia.

Yes, they do. Unnervingly
so. **DB**

64, Castellain Road, Maida Vale, London W9 1EX.

its reviews are sketchy.

Detailed warts-and-all reviews of worthwhile products are needed, as many as possible, but details are sometimes omitted of the auditioning situation (too often there is only one) and the reference (if any) the product is compared to.

Sometimes, indeed, it is the reviews that are omitted. In 18 months you have reviewed one set of headphones. Nothing on equipment supports, 'speaker stands' and 'speaker leads. Next to nothing on interconnects. Rather more on personal stereos and midi and 'lifestyle' systems.

Still more on tweaks, e.g. the serious suggestion that aerial to tuner co-ax would probably be improved upon by a cable costing £25 per metre, though the reviewer apparently did not test the idea. Possibly cost was a factor!

Are these priorities correct?

Also, the record reviews are a bonus only if sufficient equipment is reviewed. Otherwise I see them more as a convenient hook on which to hang advertising space for record distributors.

It is harder to spot a pattern for major items not reviewed, but as an example the Mission 753 made a big impact when launched about a year ago. Why no review of that? No mention in Trade Winds either. How are products selected for review?

Finally, your World Favourites section is not being kept up to date. For example, Audiolab's 8000T is surely worth a place on the tuner list, and the REL Stadium was discontinued some time ago, I believe. Also I think you should expand the lists and offer a cheap photocopy service for past reviews.

**Brian Cochrane
Chatham,
Kent.**

I agree that it isn't always the case after buying a separates

system that hi-fi becomes a hobby. But once aware that hi-fi, as we know it, exists, it is more likely to become, say, an interest. My desire is to inform people that the £600 midi does not offer good sound quality for the money; in other words, it is poor value. If people don't know that an alternative exists they will continue to shop for midis.

Hi-fi doesn't have to be a hobby, but as a magazine we aim to cater for the enthusiast who is demanding, someone who wants to read written by people who share their interest and knowledge. We're not journalists putting together a buying guide that says simply product X is the best on the market. Our readers want to know what qualification we have to make that judgement and why we feel that product X is good or bad. You for one have recognised the amount of time and effort we put into our subject, and I hope you trust our judgements because of this.

Although we aim the magazine at enthusiasts, this does not preclude the occasional reader, or those looking to get off at the next stop. Although we give a full report on each item we review, I hope the layman can still understand what is said. Our measured performance section is included with every review to validate the product, the review, the understanding of the person writing the test and warn of potential disasters when partnering with other equipment.

All of the equipment we review is compared with a reference, but as you say it is not always stated. However our regular readers will know that, for example, Noel commonly uses a Garrard 401 with SME 312, Goldring 1042, DPA head amp, TEAC CD transport, DPA DAC, Audiolab 8000 pre and power amps and Heybrook Sextets; I use ESL-63s, a Deltac 50S

pre/power amplifier and, until recently, Micromega's transport and DAC. Because the majority of our readers buy the magazine every month they are aware of this and don't need to be told every month.

We do not always mention the reference system in print, it would be unfair to compare a budget loudspeaker to the Quads, but we do use a reference system to validate critical areas of a products performance.

Your point about being able to make a valuable shortlist is something we will consider carefully.

Our views are usually less extreme than those of our rivals, falling between the 'rave' review and the 'slamming'. The reason for this is that final choice depends much upon personal taste and circumstance; rigid dogma invariably reflects limited outlook or experience. We try to convey first and foremost what a product sounds like, so people are able to draw their own conclusions. Hopefully this serves to guide readers towards products that will suit their personal tastes and give them the chance of making a useful shortlist.

We have tended to hold off from cable and stand reviews because these items are so system dependent. It is very hard to make a valid judgement on a cable or stand without trying it with a huge variety of equipment. Even then it may be the case that a cable has a significant effect with one particular product, but sounds terrible with all others tried. Does this make it a good or bad cable? We will be doing more on cables and stands in the future, but as yet are undecided about how to go about this in a useful and meaningful manner.

Thank you for your comments, we take all of our readers letters seriously and

note what you want. We like to think that this is the reason for the incredible uplift in circulation we are seeing. Keep telling us what you want from the magazine; it's in our interest to listen.

DB

Thanks for your critique. Many readers feel that product reviews have a 'commercial' flavour, being used by manufacturers as vehicles to promote products, and that such articles don't necessarily accord with their interests. I must say that I can both see and understand this view, and there's some truth in it. Our features and histories in particular, as well as DIY, have attracted enormous interest from readers, but interestingly, little from the industry itself which is too often overly concerned with "pushing product" through reviews - and little else. The solution here is to produce a bigger magazine with more reviews and more features, is it not?

Your cynicism strays a little too far in seeing record reviews as pegs for advertising. All our rivals, except Hi-Fi News, have dropped record reviews, because they are laborious to arrange, costly and of dubious value, at least in their eyes. Inevitably, I have considered this, but then I remember how appreciative readers are of expert record reviews, how popular our record mail order service is and how a hi-fi magazine is really all about enjoying music. Ideally, we will be putting more effort into this part of the magazine soon.

In my many years as an independent reviewer I have participated in numerous organised listening sessions and have arranged and run them myself. In my view, they introduce more problems than they solve. The worst is the generally upsetting and unrepresentative conditions they impose upon the

listeners, which can result in peculiar and confusing conclusions. People are not relaxed in a group and often they are not well sited to hear a stereo stage as it would be heard in the home. Playing music in short excerpts allows insufficient time for assessment and repeating the same pieces over and over again produces fatigue.

We rely on using listeners with experience, giving them time to review products properly in their own home or under normal domestic conditions. Most of our reviews are double checked, made possible by an in-house listening room, plus of course an electronics lab for measurement. I value the unforced consensus we can reach through this unique system, but all the same I keep a constant watch upon the validity of our conclusions by talking to dealers and others about their views. A lot of effort is put into ensuring that our measurements and subjective impressions are accurate and valid, as well as sufficient to usefully describe what a product has to offer. **NK**

RADFORD RUMBLE

In your November issue NK said of the Radford STA 15: "No attempt has been made to limit subsonic amplification, which in the days of record warps I believe was unwise"

But the instruction manual for the Radford SC22 pre-amplifier, which partnered the STA 15, stressed that the unit's rumble filter "should be in circuit at all times on disc reproduction" but was "switchable to

satisfy the user who feels that frequencies below 35Hz are of some value, and for special purposes".

My own STA 15 and SC22 have been in regular use since bought from new in 1968. I also have a Chapman S6BSFM-AM valved tuner with a transistorised stereo decoder. This, with most of the original valves and all other original components except the tuning pointer's drive-cord (replaced in 1970), has also been in regular use since 1968, belying a comment in a recent Hi-Fi World review of a vintage American tuner that British valved tuners didn't last because inferior components were fitted.

The multi-waved Chapman is also a superb shortwave receiver, with "bandsread" coverage of shortwave bands.

Come along and have a listen, Hi-Fi World!

**Philip Postings
Essex.**

Low frequency subsonics, when fed through a valve power amplifier, will tend to drive the output transformers into magnetic overload, causing distortion. It is therefore wise to prevent

such frequencies being amplified. This is easily achieved by installing a simple filter on the input of the power amplifier. The SC22 preamp does indeed have a subsonic warp filter, but what if the STA15 is partnered with a different preamp? In the interest of compatibility with a wide range of equipment it would have possibly been wise to include a simple filter on the input to the power amp. It is a small point I know, but for anyone considering using a STA15 with a modern pre-amp, it is a useful piece of information to have. **DB**

THE AFFORDABLE TURNTABLE

At this year's Chesterfield hi-fi show I saw and heard the exceptional Nottingham Analogue turntables - they are great but alas too expensive for me (as is the LP-12, Pink Voyd, 30A etc.).

I also heard the mega-expensive Basis Debut Gold Reference (unbelievably, it sounds much better than I thought it might). The build quality is absolutely superbly/incredible. The massive bearing looks likely to need months if not years to

run in fully. The whole deck looks likely to withstand a bomb attack. Two likely places for improvement;
1. No outboard power supply/control.
2. The clamp.
So there we have a super piece of analogue hi-fi at a price which would buy you a good car or even a small cottage.

Therefore thank God then for your articles on the Garrard 301/401 for us humble hi-fi people. It's a great pity the original plans/drawings were not available as I am sure some small precision engineering firm could produce the next generation: the 501.

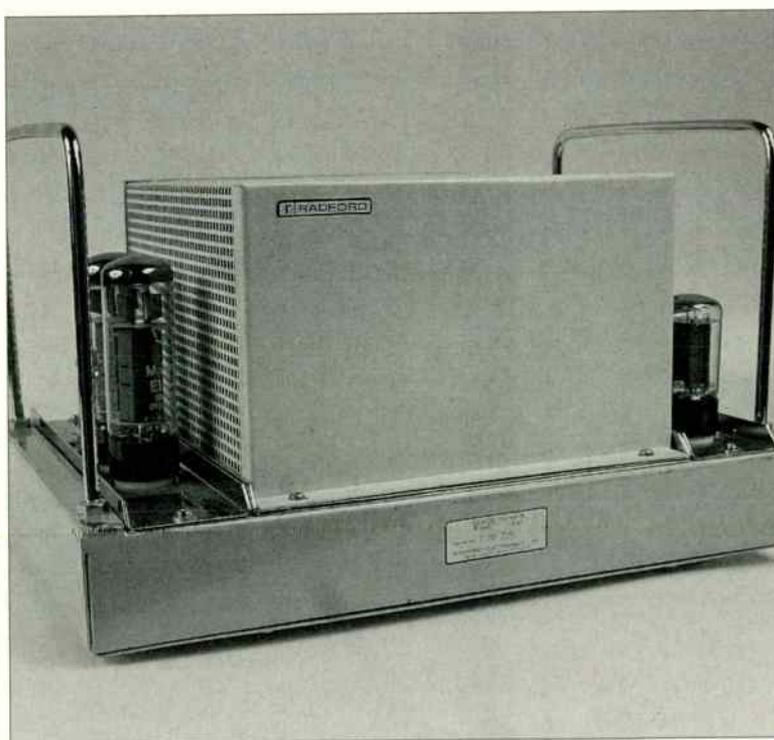
I feel sure there would be a market for this. Especially if all the minor faults on the originals were ironed out. With new technology this should be possible and it may lead to an export winner. At the moment I shall keep combing the car-boot sales, second-hand shops and newspapers etc. for any 301 or 401 which might appear.

In the early 70s I recall Cleartone Hi-Fi selling a good valve system with a 401, a Leak Amp and Wharfedale 'speakers. So there should be quite a few around here somewhere, or have a lot of these found their way across to Japan?

**P. Martin
Bolton,
Lancs.**

Unfortunately yes, a lot of quality vintage equipment has long ago been swallowed up by the Japanese. Even sadder still, we still hear stories of people destroying or junking Quad ESLs, Garrards and Leak amplifiers, believing that equipment of such age can't possibly be of any value.

The truth, of course, is that there is a great deal of excellent vintage equipment around, as long as you know what to look for. There is a lot of rubbish as well, but



The beautifully restored Radford STA15 by G.T. Audio

continued on page 53... ▶▶

Astonishing Revelations



Don't Just Look - Listen.



Tube Technology, Design & Manufacturers of High Quality Tube Amplification & Distributors of Gold Aero Vacuum Tubes. Please enquire for further information on our range of amplifiers and Gold Aero Vacuum Tubes. Hatch Farm, Chertsey Road, Surrey, KT15 2EH, England. Tel: 0932 850361 Fax 0932 850354. ~ Just Pictured; *The Gold Aero Unisis*, Integrated 30 watt All Tube Stereo Amplifier.



PREMIER MARBLE LTD

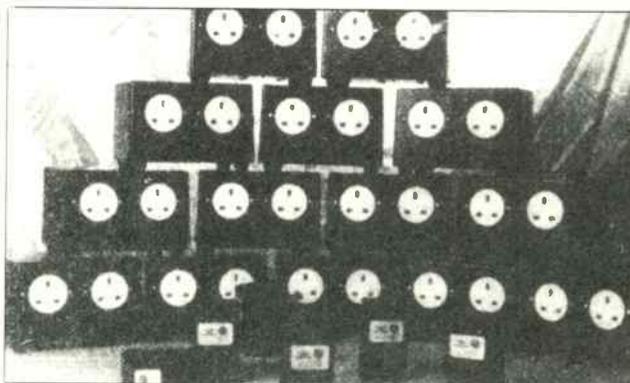
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High Tech Aura

Aura's first loudspeaker uses a high tech carbon fibre bass unit and soft dome tweeter. Dominic Todd listens closely.

A loudspeaker from Aura is something of a surprise, since their connections with B&W would have lead us to believe that there wasn't any need for one. Such is the vast range of B&W loudspeakers that I would expect Aura to be guilty of duplication. Yet Aura's aim is to not simply market this as a single product, but to use the speakers to make up a full Aura system. With matching amplifiers, tuner and CD player now joined by these speakers, Aura have a defence against companies such as Arcam, who cottoned on to the idea of a "one make system" some time ago.

The speakers themselves consist of plain, black, vinyl wrapped boxes, with a figure of eight brace in each. They're a two-way design, ported at the front. A one-inch soft dome tweeter is nothing exceptional, but the 6 3/4" woofer is more unusual in that it's made from carbon fibre, and is contained by a cast chassis (pressed steel is more usual at the price). The screws securing the woofer are covered with a plastic ring (a trick learnt from B&W no doubt). Separate crossovers, for bi-wiring, are also provided.

The Strangers, "Always the sun", from the album of the same name, showed the Aura's to have fair imaging, but also to be rather flat. Confusion set in whenever the track became complex, but with simpler sections the performance became well integrated and pleasant enough to listen to. Their bass proved to lack crispness, although the lower midrange compensated to a degree with good pace and timing.

Things didn't improve too much with "Shoulders-The Fun Never Stops". Vocals sounded a little recessed and boxy. There was little real bass extension and texture: a floorstanding speaker of the same price could improve on the former, and a miniature, the latter. Once more, when ever the track became complex a harshness could set in.

Carl Orff (Fortuna imeratrix mundi)

sounded rather dull, with fine detail lacking. Yet when the pace quickened, a veiling set in that once more emphasised the boxy nature of the SP-50s. Dynamics were always fair, but never exceptional considering cabinet size and price.

Overall, the Aura SP-50s had a definite preference for simpler music, with which they were relaxed and informative. However, whenever the music became more complex, a harshness seemed to set in, making the SP-50s uncomfortable to listen to.

As a four hundred pound speaker in their own right, the new Auras don't quite make the grade. There are others around that offer superior dynamics with less boxiness and compression. Compacts of

the same price offer greater detail and texture to individual instruments, whilst some still manage bass extension near or equal to the SP-50s. However, as a speaker to complement the Aura range they are more successful, having a balance diametrically opposite to that of the Aura amplifiers. This will bring some overall sense of balance to a complete Aura system, one the company can market against Arcam and Far Eastern offerings ●

Aura SP50 £399.95
Aura Designs Ltd.,
Marlborough Road,
Churchill Ind. Est.,
Lancing, W.Sussex. BN15 8TR
Tel: 0903 750 750

MEASURED PERFORMANCE

Aura's first entry into the loudspeaker market is the SP50, a reflex loaded stand mounter using a plastic dome tweeter and an interesting woven carbon-fibre bass/mid unit. Unfortunately, the two haven't been as happily married together as they could have been but, ignoring the dip in the crossover region, Aura's SP50s stay within 2dB limits right up to 16kHz which is certainly reasonable. However, it is the overall downward trend that is the problem. The SP50s will almost certainly sound dull due to the 4dB drop in level between 125Hz and 16kHz.

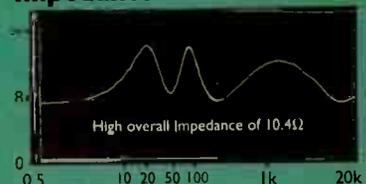
Elsewhere, the SP50s measure reasonably well. Their overall impedance is a high 10.4Ω and the impedance curve quite flat, so they are neither current hungry nor a reactive load. Sensitivity is quite low - I measured 86dB - so they will need a reasonably powerful amplifier to fill a room; I would recomend 30watts or more to get the best results.

Aura's SP50s measure reasonably well, but be prepared for them to sound dull or over-warm - they may be a good remedy for harsh sounding amplifiers. **DB**

Frequency Response



Impedance





There's a growing market for high quality integrated amplifiers

Todd listens to characterful contenders from Britain

NAIM NAIT 3

The Naim Nait has been out for so long now that I couldn't trace it back before 1986 (my oldest surviving hi-fi magazine). During the late eighties, it became the Nait 2, and received the new style Naim grey casing complete with glowing green logo. Both physically and sonically, the Nait has always been something of an oddity: shoebox proportions, sparse aesthetics, DIN sockets and decent current delivery, despite boasting only twenty or so watts. Yet these are characteristics you'll find throughout the Naim range and they're what a loyal band of Naim followers keep coming back for.

It's with these devotees in mind that Naim has wisely decided not to change the overall design of the new Nait 3 too much. Yet it's clear that the 3 is also designed for a wider audience than previous Nait's. Gone is the shoebox sized housing, to be replaced by a slim, full width, steel wrap case. Owning a Naim doesn't mean economising on the sources now, either. The Nait has five inputs including one marked (shock horror!) VCR. Also included are balance, mute and tape monitoring controls.

However, Naim quirks that may please the enthusiast still exist, but also prove frustrating and plain old-fashioned to others familiar to more conventional amps. Four of the inputs are DIN sockets. This may tidy the rear of the amp a little, but it also severely restricts choice of interconnect cable. The thickness of cable

that can actually be put into a DIN plug is also a limiting factor for those making up their own cables.

Other grumbles for an amp of this price are cheap banana sockets which won't take bare wire, lack of a headphone socket and a captive mains lead. I was also disappointed to find that the £500 Naim didn't have a phono stage as standard. More's the pity as Naim's phono stages have always been well above average in this class of amplifier.

Despite a low power output, the Nait 2 always had a tremendous ability at driving almost any speaker put its way; the 3 is similar. Coupled to a pair of Tannoy D100 loudspeakers, the punch and depth to the bass was reminiscent of much larger and more powerful pre/power combinations. Dina Carroll's "You'll never know" made fine use of this. The electronic bass was obviously just that - electronic, but it laid a powerful foundation that gave real substance to the sound.

However, Naim's have also been known for their rather analytical nature, and the Nait doesn't suffer poor recordings gladly. With INXS's "All Around", I was reaching for the volume control such was the ruthlessness with which the 3 stripped the recording bare. It could become rather wearing with some types of music after a while.

Yet, one would have expected plenty of detail as compensation. This is not the case. In fact, the opposite is true. Higher frequencies sound compressed and lacking separation. A Pioneer A-400 made a far better stab at unravelling instruments,

whilst avoiding the Nait's compression. The cynic would argue that the lack of separation is down to the fact that Naim have much more expensive pre/power amps that have to clearly demonstrate superior sound quality to the cheaper integrated. And it's in the area of improved instrument separation that these models really score, thus luring the Naim buyer ever upwards on the Naim ladder.

Used with something less processed, such as Clannad's "Macalla" album, the sound opened up. Female vocals were still a little compressed and the soundstage was somewhat limited in width. Yet tracks like, "In a lifetime" possessed an earthy quality, that whilst being obviously coloured, was involving through a rhythmical and solid bass and strong presence from both male and female vocals. The colouration showed up in a rather weedy sounding sax, and guitar that lacked the delicate subtlety shown by something like the Triangle amp. Put simply, the listener would find it more difficult to distinguish between different types of a particular instrument with the Naim than with some rivals. The pay off is an involving nature that, almost, allows you to forgive the lack of detail.

What is not so easy to forgive is the confusion that sets in during complex pieces of music. Acoustic Alchemy's "Red Dust and Spanish Lace", from the album of the same name, demonstrated this. Towards the end of the track all hell is let loose as steel and nylon strung guitars, keyboards, bass and percussion all vie for the attention of the listener. With the

CONTEST



priced around £500. There's also growing competition. Dominic and France, the Naim Nait 3 and the Triangle TE-60.

TRIANGLE TE-60

Until now French amplifiers, such as YBA, have been the sole preserve of the lucky few. That's not because the French don't make cheaper amplifiers, it's simply because British designs have such a strong following in their homeland that the French haven't seen it as economically viable to export their "bread and butter" products to Britain. This is about to change: Kronos distribution are now importing the Triangle TE-60 amplifier. Priced at £500, it's going to hit the market occupied by Linn, Naim, Audiolab and Alchemist, all of whom field profitable and well respected amps in this price sector.

Entering such a crowded market place isn't going to be easy for the TE-60, though. If it's to have any chance of succeeding, it can't simply be as good as the best Brits. It must offer something unique too, to attract those who would otherwise plump for a well known quantity in the form of a Nait, 8000A, Kraken or the like.

Features wise, the TE-60 offers all the right items. It's not overlaid with tone controls and gimmickry, but it doesn't fall into the "black box with a volume control" category either. Controls are as the Nait 3, except with a headphone socket in place of a tape monitor button. This means volume, balance, selector for five inputs plus cassette deck (one more than the Naim) and a muting switch.

However, this is where the similarity between the Nait and Triangle ends.

Whereas Naim prefer to use DIN sockets, the TE-60 uses the more conventional gold plated phono sockets. There are also four speaker outputs against the Nait's two, and the French amp can be used as either a separate pre or power amplifier, without a dealer modification.

The styling is also the complete opposite to the majority of slick, understated British amps. The gold, pear shaped inset, fussy graphics (in French of course), and rather clumsy knobs, sockets and switches tend to give the impression of being rather "overstyled".

A power output of 80watts into an 8 ohm load needs no excuses and makes even the brawniest of Brits, at this price range, look under-endowed. Yet, surprisingly, when it comes to a 4 ohm load, where one would expect the power rating to double, it actually falls to a modest 30watts. Both figures suggest the TE-60 won't be happy driving speakers of a highly variable impedance rating.

This had a marked effect on sound quality and in listening tests the Triangle proved to be a mirror image of the Naim Nait 3. At first, the overall balance reminded me of something like the now-discontinued Alphason Apollo: an ambrosia sweet treble reminiscent of a Class A or even valve amplifier, delicate and natural vocals, and a rather lightweight bass that encouraged the listener to keep turning the volume up, in order to gain a little weight and scale to the music.

Whereas the Nait had been forthright,

punchy, but rather coarse, the Triangle was detailed and totally unfatiguing, but ultimately rather lacking in clout and listener involvement. What was needed was a change of speakers that would suit the French amp better than the Tannoy D100s that I'd been using which, despite usually being an easy load to drive (5-9.5 ohms), proved a little thin sounding with the TE-60. The change came courtesy of Ruark in the form of their Sabre IIs.

Switching to the Sabres did flesh the bass out a little, but the drums on "Almost seems" from the Clannad album, got no where near matching the impact offered by the Naim amp. Bass was tight, extended and never got in the way of the articulate mid range, but simply failed to underpin the music as the Nait had.

The French amp did hold the upper hand on poorer recordings that the Brit had simply balked at. Although the INXS album still sounded compressed and confused, it was bearable at higher volumes and detailed guitar riffs could be heard through the mix. Dian Carroll's "You'll never know" lacked the energy of the Naim, but it also brought with it a tight grip on her vocals that never led higher frequencies to "spit" yet, by the same token, the vocals were so smooth and refined that it was an unnatural balance for this type of music that erred on the side of blandness.

Acoustic Alchemy's "Red Dust and Spanish Lace" was also produced with far more dexterity than the Nait. Whereas with the Naim it had sounded like a cacophony of conflicting instruments, the

....NAIM NAIT 3 CONTINUED

Naim Nait it did all become rather overwhelming as instruments clashed and it became difficult to tell exactly what was playing and when.

In summing up, Naim can breathe a sigh of relief in not alienating any of its present customers with the new Nait. On the other hand, it's too much of a mixed bag to appeal to those with an open mind looking for a £500 amplifier. The sound certainly has its moments with simpler music, but when the pace quickens things do tend to fall apart.

As well as being rather sensitive to the type of music being played, I also found the Nait to be particularly choosy about partnering equipment. Any speaker or ancillary that sounds remotely brittle or harsh, will be ruthlessly exposed.

....TRIANGLE TE-60 CONTINUED

TE-60 dutifully separated nylon from steel guitar and keyboards from percussion and bass. It made it possible to follow a single particular instrument through what is an especially dense mix. Whilst the Triangle was maintaining its grip on the separation of the individual instruments, the listener was also given an excellent insight into the music, with literally every breath and stroke clearly heard.

Downsides were a sound stage that was adequate, but no more, which in turn meant that although the instruments were well separated, they didn't really fill the room, escaping sufficiently from the speakers. The bass continued to offer little in the way of presence, which slightly spoiled what was otherwise an enjoyable rendition. Overall, I found its smooth, detailed and coherent sound preferable to the rather brash Naim Nait 3. Yet, its lack of bass power and rather uninvolved balance means it's something of a hollow victory over the Naim.

CONCLUSION

The final choice is very much a matter of taste. It comes down to the roughneck (Naim) versus the dimbulb (Triangle). Don't forget, though, that amps such as the Audiolab 8000A and Alchemist Kraken offer a more rounded balance between these two contenders.

But it's not just other class contenders that show these two amps up. The Naim Nait 3 and Triangle TE-60 find themselves caught on the horns of a dilemma. Both aim to offer customers a taste of the high end, yet neither come close to matching more expensive amplifiers from the same companies. Nor are they competitive against several "superamps" costing up to half as much. Both the Denon PMA-350II and Pioneer A400 offer a more convincing sound with fewer vices.

So this contest comes down to more than France taking on the Brits. The real winners here, and not for the first time, are the Japanese ●

NAIM NAIT 3
MEASURED PERFORMANCE

The new Nait 3 has a limited output of 28watts, or 42watts into 4ohms. It is best partnered with sensitive speakers for best results. From experience I know it is very easy to run an amp like this with normally sensitive loudspeakers (circa 86dB) and over-drive it, producing distortion.

Naim roll off treble output from the Nait 3 very early. It measured -1dB down at 22kHz, at all positions of the volume control. This always yields a warm, but 'enclosed' sound.

The Nait 3 is unusually sensitive, needing just 50mV of input to deliver full output, through all inputs. However, there was no overload at 3V input, so the Nait 3 will not overload with CD (2.5V max.). Naim use buffered inputs, overload occurring at +40dB they told me, or 5V. High sensitivity has been provided to cope with the odd, rare, low output source, like a Leak Troughline tuner.

A result of this sensitivity was a little more hiss than usual at high gain. Even at low gain though, the output stages produce some hiss, suggesting most gain is after the volume control. Whilst the Nait won't sound unduly hissy at normal listening distances, with sensitive 'speakers, hiss will be audible when close up.

Distortion levels were low and, perhaps more importantly, mainly second harmonic

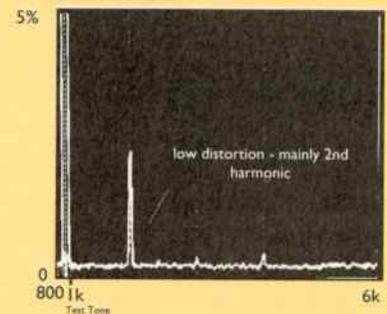
in nature. There was some small increase at high frequencies, but not enough at 0.13% maximum to suggest treble harshness.

The Nait 3 has some unusual parameters, but they're intentional. It is very sensitive, but it is also a little hissy. It will sound warm, due to early treble roll-off. This amplifier is well engineered, but differently engineered too. **NK**

TEST RESULTS

Power	28watts
CD/tuner/aux.	
Frequency response	11Hz-22kHz
Separation	76dB
Noise	-85dB
Distortion	0.005%
Sensitivity	50mV
dc offset	-7/-9mV

Distortion

TRIANGLE TE60
MEASURED PERFORMANCE

The TE 60 runs into overload very, very slowly, much like a NAD amplifier with Soft Clipping switched in. It sounds good until you realise that distortion sets in earlier than usual as a result. The TE 60 is nominally rated at 60watts, but the handbook is riddled with subtle qualifications about this. I measured no less than 78watts before serious output clipping set in, but only when driving an 8ohm load. Amazingly, this fell to 30watts into 4ohms, irrespective of the drive signal (i.e. continuous or pulse) due to what appeared to be current limiting. Worse, the same progressive distortion characteristic meant that at just 10V into 4ohms (25watts) distortion measured 0.5%. That's much more than a good valve amplifier and rather more than I would consider sensible.

Luckily, many British loudspeakers have a high overall impedance of around 10ohms and will match it well. However, those of true 8ohms nominal impedance inevitably dip down to 4-6ohms in places and will not suit the TE 60 well. It produces a lot of distortion into low loads.

There was slightly more hum on the output than our own K5881 valve amplifier and a lot more hiss. It's relatively easy to make solid state quiet, so I wasn't especially impressed by this. D.C. offset on

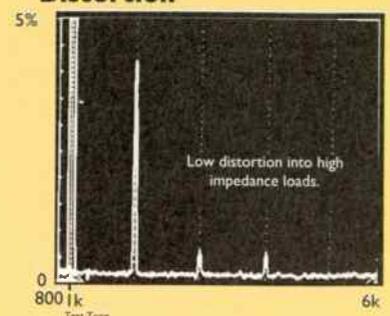
one channel was a high-ish 50mV, on the other a normal 3mV, suggesting rather haphazard d.c. servo circuit behaviour.

The TE 60 has an eccentric measured performance. I would expect it to sound different, but whether this is a good thing would be open to question. **NK**

TEST RESULTS

Power	78watts
CD/tuner/aux.	
Frequency response	17Hz-30kHz
Separation	55dB
Noise	-97dB
Distortion	0.01%
Sensitivity	340mV
dc offset	3/50mV

Distortion



...continued from page 47

people are becoming increasingly aware of what is worth having, and what should really be thrown out. I for one use a Leak Troughline + decoder and have the loan of a Garrard 401, Slate plinth, SME IV and Ortofon MC.

The basic Garrard 401 and Leak Troughline are excellently engineered, but

purchased it for £100. As it had no ON/OFF switch and strange 5 pin DIN output socketry, some modifications had to be made, so why not, I thought, fit a new power supply in it, a la Russ Andrews' latest thinking on modern components.

'Coventry Hi-Fi' generously agreed to do the assembly free (!) if I supplied "the bits". After some problems with hum, due to a

designed down to a price and up to a specification.

How about mounting a blind challenge between models of today and yesteryear. I'm sure it would be an interesting article.

It seems that for some years the limit of tuner reproduction has not been the design of the tuner, but the limiting and compression of the transmission due to the infamous 'Optimod'. We can look forward to a declining FM Sound quality. Perhaps the '60's were the golden years for FM as well as for analogue!

**Martin Mason
Coventry.**

PS: Is the Paravicini Stereo Valve Decoder still available and will it suit the Quad FM II?

It does seem that a lot of vintage equipment from a similar era to that of the Quad II tuner was better engineered for sound quality than it is today. But what must be remembered is that there is only a small selection of vintage equipment that really is good. In much the same way there is plenty of excellent equipment around today, but there is also a great deal of average equipment that will be worthless within a few years.

The whole approach to audio engineering has changed over the last couple of decades. Engineers are now as much concerned about convenience and style as sound quality. Sad, but after all, that's what sells hi-fi to the general public.

Tim's decoder is still available and if your tuner has an MPX output socket, which as far as I remember it has, then there should be no problem adding the external decoder, other than pilot tone adjustment is necessary to optimise channel separation. **DB**

It might seem an odd thing to say, but I believe design has been subverted by technology. Tuners have

always been difficult to design, so when faced with solid state 'silicon chip' packages of extremely high measured performance, but low price, manufacturers have become eager and (here's the crime!) unquestioning buyers.

Modern technology hasn't been entirely ineffective. What you get is a relatively low cost, highly stable, reliable, consistent and easy to use tuner, to which RDS adds even more gadgets and convenience. High standards of RF performance and audio performance are the norm, as well. But these tuners sound pretty mediocre, much in the way you explain.

Good sound quality arises from simple, elegant circuitry, not the sort of complex signal processing found in modern RF silicon chips.

It would be possible to design a modern synthesiser tuner that uses valves, believe it or not. I've discussed this with Tim de Paravicini and Mike Creek, both of whom agree it would probably yield superb results. If nobody else does it, we may well design such a beast in a few years time. **NK**

MAINSTREAM HI-FI

I am an avid reader of HFWD and have been so since its inception in March 1991. I admire in the main how your publication has developed over the last couple of years. I also agree with your view of the hi-fi press as almost exclusively all articles in other hi-fi mags are simply geared to newly released products - Kaleidoscope November 1993. Yours is the only hi-fi magazine I buy each and every month.

I am however concerned in that you do not review much in the way of so called mainstream products. I am the owner of a fairly high-end Linn system and chose the Karik/Numerik on audition after listening to a number of



Garrard 401 with slate plinth, SME 401 Celebration arm and Ortofon MC 2000 cartridge - dynamite!

without the SME, Ortofon, Slate plinth, decoder etc treatment they are just that, well engineered and pleasant sounding. They only give exceptional results with the right kind of treatment. When you do find your 401, remember that it is not the end of road, it will require care and attention, let alone money, before the magic shines through. **DB**

QUESTIONING PROGRESS

May I relate my recent experiences which have led me to question the progress we have made in the last 25 years of hi-fi.

It started when I visited "Coventry Hi-Fi" to enquire about some P.A. equipment. They had an old (1969) Quad FM II valve tuner for sale. Falling to temptation, I asked if it could be coupled up for a demo. It sounded so beguiling that before I knew it I had

wrong choice of cabling, the finished unit was ready for trial. Testing against some of the most respected (by your reviewers) tuners of today including those with the "closest approach to the original sound" revealed that although the FMII was inferior on hiss and separation, it was (surprisingly) significantly superior on sound quality - it had dynamic weight, a naturalness which only valves seem to give with a musicality and rhythm i.e. timing which really was exciting and involving.

Gone was the transistor steeliness and glare, and a subtle artificiality which even the better specification modern tuners give!

It leaves me with the question, "what progress have we made in 25 years"? When a discrete-component, well designed, valve tuner can "kick the pants" off our modern equivalent, which has been

TRIANGLE

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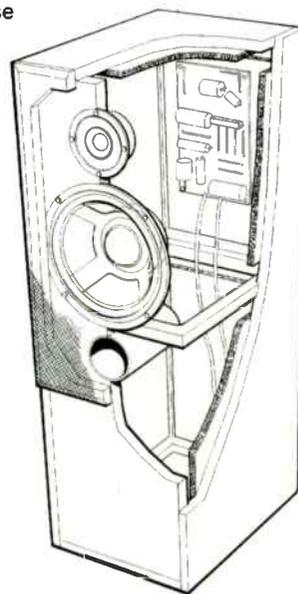


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...continued from page 53

other transports/DACs. I consider this to be a landmark product, as do a number of other hi-fi mags. I therefore wonder why products such as this, as well as, say, Roksan products are not at least reviewed so you can give your own opinion, which I highly respect, especially bearing in mind that many of your readers would consider buying a product such as this.

I am not for one minute suggesting that your magazine should be like the others - HFW is unique and I would

such a section. Isn't it about time? I am sure this will also help increase your readership. Anyway keep up the good work!

**Johnathan P. Diamond
Bishop's Stortford,
Herts.**

At the same time as we received your letter, we also took delivery of a complete Linn system, which was reviewed in the December '93 issue. Unfortunately, for reasons of space, that will possibly be all we'll review from Linn for a while. We try and cover as much of the

Another problem we face when trying to get review equipment is that manufacturers know we take a critical view on hi-fi. We are all hi-fi enthusiasts, have had a large amount of experience in hi-fi and know what is good and what is poor through years of listening to a huge range of equipment. We will not recommend a product to our readers unless we feel that it offers good value. It is a risk for a manufacturer to send us at Hi-Fi World their product: if it's a duffer we'll not only find out - but say so! This

does tend to scare some of them off a little. More sympathetic journals are easily found. **DB**

I have to say that in most cases, where we don't review products from a particular manufacturer, it is because they refuse to send them. There are a variety of reasons for this. They may not want to

increase demand (assuming a good review), but more often than not they would rather not take a risk. Linn are not especially co-operative, nor are Roksan even though, as a matter of form, we regularly request products for review. We may well soon decide to be more positive about this and borrow their products from dealers but at present there's so much else of quality to review, it's not a priority with us. **NK**

EQUALISATION

I have read your review of the Newnes 'Audio and Hi-Fi Handbook', and I am grateful for your general approval of my contributions to this. I am naturally sorry that you should feel that I am rigidly conservative in my views and intolerant of any opinions

which differ from my own. It is certainly not my wish to be so - I am under no illusions about the limits of my own knowledge or understanding, nor am I any less keen to learn from others.

However, I have been involved in the theory and practical application of audio electronics for a very long time, since I started young. Inevitably, I have become somewhat jaded in my response to those 'new discoveries' which have been discovered many times before, and I lack enthusiasm for theories which conflict with what happens in reality, or advertisers 'hype' for hypothetical qualities.

With regard to your review, I must, I regret, assert the correctness of the curves which I published for cassette tape replay frequency response, though the graph was somewhat ambiguously titled. The relationship between a 'time constant' and a 'turn-over frequency' (fT) is given, in the case of a simple RC network, by the equation:

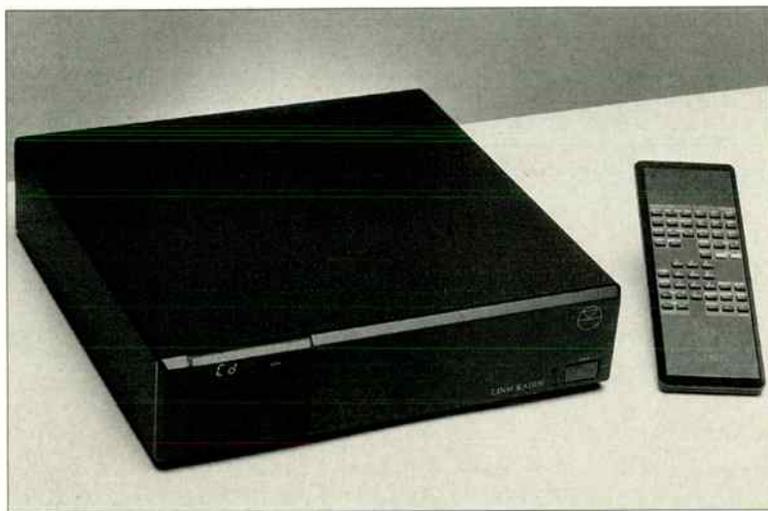
$$fT = 1/2 \pi CR$$

where C and R are given in Farads and ohms.

So a 70µs time constant, given by, for example, 7KΩ/10nF combination would have a (+3dB) turn-over frequency of 2.27kHz, and a 120µs time constant would have the lower fT of 1.33kHz, which is as shown in my graph.

**John Linsley Hood
Taunton,
Somerset.**

The title to your graph in the Audio & Hi-Fi Handbook I reviewed says quite clearly that the graph is of "probable recording frequency response" and, as you obviously realise, the 120µs and 70µs curves were transposed and, therefore, the diagram was wrong. It's difficult to accept your assertion that this graph is of "replay response", since that is clearly not what its caption says. **NK**



Linn's Kairn pre-amplifier, no longer in world favourites because it was reviewed over two years ago, still worth auditioning though.

want it to stay that way, but I do feel the balance needs shifting slightly to include mainstream product reviews.

Would I also be right in saying that one of the manufacturers you fell out with was Linn (Kaleidoscope - November) as they don't seem to advertise with you any more and the Kairn pre-amplifier that was described by Danny Haikin in the August 1991 issue as "the best pre-amplifier I've ever heard" doesn't even get a mention in "World Favourites". If you have fallen out with Linn this should not be a bar to you reviewing their products - you at least owe it to your readers.

Lastly you have been going now for over two years, yet you still do not review soul/dance releases. I did write some time back and you said you were hoping to include

market as possible, which means that we can't just concentrate on the 'top' names.

'World Favourites' follows our most recent reviews as closely as practicable. The August '91 issue covers a state of the market which no longer applies. There are now products around which offer results, so comments made then may no longer apply.

With the soul/dance reviews, we come back to space as the limiter. I'd love to widen the variety of our reviews, but we just don't have the space as yet. When we do, there'll be soul, metal, dance, hiphop, reggae, soca, Latin ,ragga, folk, re-releases, trad, swing, poetry, and if you're really lucky, Max Bygraves' greatest hits...**SC**

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IN THE APRIL ISSUE

You can tell winter's nearly over when our APRIL issue hits the streets, shedding sweetness and light where other hi-fi mags fear to tread, so get yourself a copy of 'Hi-Fi World' and brush off the last gloomy days of winter. We'll have (we hope!) -

DIY SUPPLEMENT No 7

Yahoo! We'll be happy to be back on the DIY trail again in April, with Supplement No7.

PROAC STUDIO 200S

Following the success we had with the Studio 100s in the February issue, we hope to bring you the floorstanding Studio 200s.

NAIM NAC82/NAP180

Naim's newest pre/power combo is closely listened to by Malcolm Steward. Could this be the amplifier to lead Naim through the nineties?

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HARMAN KARDON SIGNATURE AMPLIFIERS

Direct from the pen of Sidney Harman come the 'Signature' pre and power amplifiers. Direct from the goosefeather quill of Simon Cooke comes the 'Hi-Fi World' review of them.

QED REFERENCE DAC

The popular Digit CD convertor is back, this time in reference form. Following the hints in our DIY Supplement, QED have decided to offer a twin power supply version of the Digit.

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GYROPOWER QC

Eric Braithwaite tries the latest upgrade for the Michell Gyrodeck. Styled like a miniature Alecto, the Gyropower QC is an ultra-stable power source for this renowned record deck.



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BRITISH CONTENDER

**At £400
this British
built CD player
could be something
special, Dominic Todd
listens closely.**

At £399 the Orelle CD480 must appear a clear cut above the £300 rabble if it's to succeed in what is a highly competitive market. This is where the machine must prove itself.

Particular rivals that spring to mind in the £400 price category are the Marantz CD-72, somewhat over shadowed by its cheaper and highly successful CD-52SE sibling, and the ill fated original Rotel RCD 965 LE. The last machine fell foul of the market as it didn't really offer any sonic advantage over machines from the class below.

The Orelle's price, although rather out on a limb, actually gets it off to a good start. Four hundred pounds is very reasonable for

a British made CD player, and against the plasticky £450 Arcam Alpha 5 it looks a bargain. This isn't just another "make from nowhere" either. Until now, Orelle have tended to build machines in the mid/high end of the market. Orelle are now tackling the mass market.

The styling is pretty much unchanged from previous (and much more expensive) offerings. The player has baulky styling, but a simple and functional control layout, and restrained graphics. Having said that, I really don't think that Orelle need advertise the fact that the CD480 plays CD singles. This has been taken for granted for some years now, plus the fact that 3" singles have died a

death anyway. The Orelle is better built than you'd expect from a £400 player too: a good solid case with metal front panel and smoother controls than previous machines, but a sombre grey finish barely

lifts it from the crowd visually.

The technical spec. is rather archaic. A Philips TDA1541A Crown grade 16-bit chipset may have once been the standard, but has now been somewhat overtaken by more recent Bitstream DAC-7 and Crystal convertor designs. A characteristic of this chip is the extended low level 'digital' distortion it produces, something Bitstream was conceived to eliminate.

Sonically, Orelle CD players have always been something of a mixed bag. The CD260 was rather old fashioned sounding and not particularly competitive. On the other hand the DA180 and CD-10T, at £1400, proved quite a success.

The CD480 was coupled up to our K5881 valve amp, driving Heybrook Sextet speakers. A DPA DAC and Teac transport were used as a reference. First disc was Joe Jackson's "Body and Soul". The fanfare from the first track, "The Verdict", was produced with a slight aggressiveness, and the balance was rather too forward for comfort. Vocals lacked a little body against the reference, but the overall dynamics were better than average for a player of this price. There was more grunt at the bottom end than with something like the Marantz CD-72, for example.

More reminiscent of the Marantz range of budget CD players was the splashiness that affected cymbals. Otherwise there was good integration between frequencies. Despite the bass being a bit on the woolly side, it didn't become detached, distracting attention from the rest of the mix.

Fairground Attraction's "Moon on the Rain", showed up the vocals once again. Female vocalists could sound slightly nasal, although they were always well placed within the sound stage. Against the reference the Mexican acoustic bass used on this track proved rather bass light, although there was good detail. "Find my love" proved reasonably involving and lively, although it could occasionally get a little lost, especially with less prominent instruments such as the mandolin. Yet overall I was constantly aware of a raggedness which compromised my long term listening enjoyment.

"Stompin at the Savoy" is an old favourite from a Chesky sampler disc. The track simply consists of two acoustic guitarists, but played in such a way as to be almost seamless, with immaculate timing. It should also be possible to hear every breath of the musicians, such is the quality of the recording. It was here where the difference between the 480 and the reference was most noticeable. After listening to the latter the Orelle sounded flat and lacking verve. Guitars lost definition and the strong rhythm line struggled to make any impact. I could still hear into the recording, yet somehow it became more of an effort to notice all the subtleties.

Rachmaninov's Piano Concerto No. 2, proved just the opposite. The piano had good presence and the '480 portrayed the whole effort with fine scale and a sense of space around the orchestral instruments. The strings sounded a little processed but, all-in-all, the Orelle seemed happiest with Classical music like this.

It comes as a surprise to find that although the Orelle CD480 is by no means a bad CD player, it's far from being a class leader - its sound quality is too uneven. It becomes rather strained when pushed and tends not to be too happy with guitar and female vocalists. Yet, despite this forwardness, it can occasionally sound bland and not particularly exciting to listen to. Classical music fares better, with the player offering good dynamics and presence for the price.

One of the new Orelle's toughest, and deadliest, rivals has to be the recently introduced Arcam Alpha 5. To get an idea as to what sort of performance is expected from a machine of the Orelle's class, I decided to pitch it directly against the

Arcam.

The result was very much a case of "swings and roundabouts". The Alpha 5 demonstrated superior bass punch and, instruments were more dimensional. However, the Orelle countered this with stronger imaging on the vocals and greater detail. It wasn't something that was immediately obvious, but if one listened carefully, subtleties such as the texture of the guitar were more apparent on the CD480.

The Orelle was more forceful with Tracy Chapman's vocals and a typical multi-bit sheen was cast over the sound. Yet it made a better stab at multi-layered tracks, such as the Lemon Trees "Child Of Love".

If the CD480's sonic ability fails to break new ground, the build quality and user friendliness do at least go some way to redeem the player. This is all the more surprising, as building a CD player in Britain isn't cheap, especially compared to the majority of competitors built in the Far East, where labour comes at a fraction of the price.

However, in this market sonic abilities count for more than cosmetics. Whilst the CD480 does prove a worthy alternative to Brits, such as the Arcam Alpha 5, it can't really cut it against the cheaper "establishment", notably machines like the Marantz CD-52SEII and Rotel RCD965 Discrete. So ultimately, as worthy as the '480 is, it doesn't quite justify the extra outlay over such models ●

Orelle CD 480 £399.95
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MEASURED PERFORMANCE

The Orelle CD 480 is a multi-bit player and brings with it the distortion associated with this D/A conversion process. At -30dB the harmonics are wide ranging, as our distortion analysis shows. This may give the CD 480 a slight coarseness or rasp that the majority of 1-bit machines manage to steer clear of.

The frequency response is fairly even with a shallow dip just noticeable in the lower mid-range. There is also a slight lift at low frequencies, so I would expect the CD 480 to have good bass, but this may only serve to highlight the recessed mid-band.

Elsewhere the CD 480 measures well; it has good channel separation, reasonable dynamic range (106dB) and low spurious output, although at 20kHz this was a little higher than average. The only other area to keep an eye on is the lower than normal output. This measured 1.88V, nearly a volt lower than some of the competition provide.

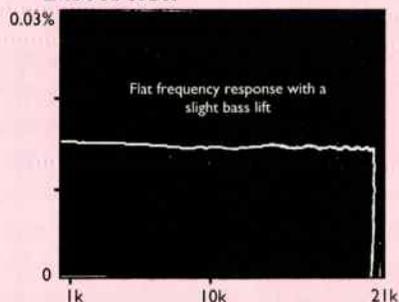
At £400 the Orelle CD 480 is one of the cheapest British CD players available.

Fortunately, not too many corners have been cut and the CD 480 still manages to turn in a reasonable set of figures. Watch the low output though in comparative listening tests. **DB**

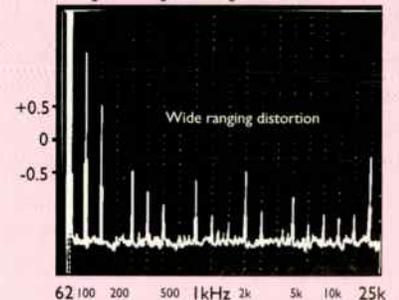
TEST RESULTS

Frequency response	4Hz-21kHz	
Distortion %		
-6dB	0.005	0.005
-30dB	0.049	0.046
-60dB	0.55	0.53
-90	51	50
-90dB dithered	12.7	12.8
Separation dB	left	right
1kHz	111	111
20kHz	93	96
Noise		-112dB
with emphasis		-114dB
Dynamic range	106dB	
Output	1.88V	

Distortion



Frequency Response





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STRATA SUBSONICS



If you're after deep bass, Dominic Baker might just have found the answer, REL's new £495 Strata subwoofer.

So, you're after deep bass. Having heard a bass guitar's lowest strings plucked through your 'speakers, its whetted your appetite, you now want to hear a 32ft church organ pipe reproduced at full level. Well, here's one answer: REL's Strata is the cheapest and smallest subwoofer in their range and as such is probably the least intrusive in a normal domestic environment. But although of quite modest proportions, it still claims to reach down to 20Hz, depending upon the listening room.

That's low enough to deal with just about any music, including full sized church organs. This is quite a claim for a box little larger than an average sized stand mounter, but with a large, heavy duty bass unit, plus an in-built active equaliser and 60w power amplifier. The ingredients certainly appear to be of a high standard.

The Strata can be connected up to a hi-fi system in a number of different ways. It can be driven by either line level signals, i.e. the output of a pre-amplifier or a headphone socket, or directly from the main loudspeaker output terminals. This second method of connection may not sound completely purist, but the Strata only needs a low current drive signal - virtually no power is drawn - so this won't effect the quality of sound from your main 'speakers.

Connecting the Strata to the loudspeaker outputs of an amplifier also gives you the option to wire your main speakers via the sub-woofer. There are two sets of terminals for this, one of which cuts the bass from the main speakers, allowing small satellites to be used without risk of damage from strong bass. However, for high quality hi-fi use, the main speakers should be connected directly to your main amplifier and the sub-woofer to the same terminals or the line level outputs of a pre-amplifier.

The Strata covers bass frequencies from 120Hz downwards, using two multi position rotary controls to select sixteen different crossover points between 120Hz and 30Hz. Combined with a separate gain control, this allows just about every type of loudspeaker to be matched in, although getting the response right can be time consuming.

I used a DPA 200S pre-amplifier to drive the REL because it has a spare set of pre-outputs. Speakers used included ProAc's Studio 100s, Systemdek's 931s, a pair of Quad '63s and Epos ES11s. The Strata can

be used anywhere within a room, with the deepest and most powerful bass coming when it is placed next to a wall. But I always find best results are gained with subwoofers when they are between, or level with, the main 'speakers. Although low bass energy is theoretically non-directional, I find that the physical vibration energy from such a device is enough of a clue for the brain to realise it's being fooled. If the subwoofer is behind you and the main loudspeakers in front, this can be disconcerting. In addition, if settings above 80Hz or so are used, low male vocals can be heard emanating from the subwoofer, in which case it is ideally placed mid-way between the two main 'speakers, where it will integrate best.

Unfortunately, the image of subwoofers has been dirtied by the many poor examples around, but there is no reason at all why they should not be used successfully within a high quality system. For the majority of my listening I used the ProAcs. Because getting extended bass from them is not necessary when using a subwoofer as well, I placed them on open frame HSB-1 stands and moved them well out into the room. In this position the midrange was clearest and had wonderful projection and focus. In fact a subwoofer takes away some of the compromise between a clear midband and good bass extension; the best of both can be achieved.

I found, after several hours of experimentation, that with the cut-off controls both set to their second position, giving a cut-off frequency of 47Hz, the Strata integrated smoothly with the ProAcs. The Strata has a phase reversal switch and it is a good idea to stand one of your main loudspeakers next to the subwoofer and switch between the two settings to find which is correct - it's fairly obvious when it's right.

The combination of ProAc Studio 100s and REL Strata worked extremely well. In fact, one friend felt that it was the best sound I'd ever had in my room, compliment indeed considering my usual set-up of ESL-63s and SL6000s costs around 4.5 times the price. The Strata has the ability to produce good, strong, clean bass with plenty of impact and depth wherever it is used. It isn't particularly room fussy and can, after a few hours of careful setting up, be integrated successfully with the majority of 'speakers.

So many subwoofers currently available

suffer from one ailment or another, but the Strata avoids all of them and plays music in an inoffensive and tuneful manner - after a while you even forget it's there. Although the smallest model of the range, it was plenty powerful enough to fill my large-ish room without trouble. If you have between £800-£1500 to spend on a new pair of 'speakers, try auditioning the Strata with a pair of compact stand-mounting speakers. You'll get the image quality, clarity in the mid-band and cohesiveness of a compact 'speaker, together with the bass-end of a really big loudspeaker. Who could wish for more?

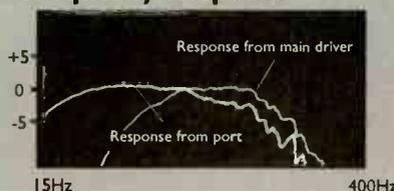
MEASURED PERFORMANCE

The frequency plot below shows two responses, one from the main drive unit and one from the port, joined together. This accurately shows the output from each and, thanks to the memory function on our FFT analyser, the two can be joined to give a very good indication of the overall response.

The response was taken with the subwoofer controls set for the highest crossover point, 120Hz, to show how smoothly it reaches 'upwards'. The response is very smooth indeed, so bass will be played evenly and tunefully, listening room permitting. The high frequency roll-off is well controlled too, which should make matching to the main loudspeakers easier. As REL claim in their literature, the Strata reaches 20Hz without problem. I measured level to be about 2.5dB down at 20Hz, which is admirable, and this may be taken slightly lower still if used in the corner of a room where the bass will be reinforced.

The frequency response of the Strata is very smooth and the cut-off controls act well without affecting its flatness. This is good engineering; the Strata appears to be a bit of a bargain for the depth of bass it can produce. **DB**

Frequency Response



reader's system

Dominic Todd visits Glenn Kershaw to find out what kind of a system a hi-fi shop manager owns.



You'd have thought that being the manager of a hi-fi shop would entail having a system at home that represented the state of the art; at trade price, of course. Yet, like the rest of us, hi-fi shop workers have mortgages, bills and other domestic pressures that don't necessarily leave a lot for hi-fi and records.

However, being manager of a specialist retailer for four years, Glenn Kershaw has been able to pick up the odd bargain or two. It's because of this, and liberal doses of tweaking, that Glenn's system has grown from a humble Hitachi music system with Philips CD up to what it is today.

Bargain number one came in the form of a pair of Cambridge A250 monoblocks with C75 pre-amp. Despite a cost of

£970 new some seven years ago, a faulty fuse was all that Glenn had to cure to put things right. The price? To you sir, one hundred pounds. In their day they were touted as offering mega watts for the money; £1.40 per watt to be exact. Not bad, but even better when secondhand, and the figure drops to an amazing 20p per watt! Put into context, a high value NAD 304 amp from today's market costs £3.29 per watt. But power isn't everything, as Glenn is first to admit. It wasn't just the fact that the Cambridges are amazingly powerful, offering 468 watts to each of my 4 ohm speakers, they were also highly rated in their time on sonic grounds - even Noel remembers them being something special (he's got a pair in the loft).

Like most of us, Glenn now sees a

valve amp as the *only* real upgrade as far as amplification goes. Favourite at the moment is the Lumley Reference ST70. Although it'll take more than a billion fuses to pick one of the two thousand pound beasts up for a hundred quid! But having said that, the Cambridges haven't been left untouched. Despite the power amps costing a lot then, they still had to be commercially viable, and this meant cheap wire inside to keep the cost down.

The internal speaker cable has been replaced with Rotel Supra 4, and the phono sockets are now connected to the circuit board via Audioquest solid core. Glenn recalls trying to persuade a customer that cables really do make a difference - "He was adamant that cables didn't make a difference until I demonstrated the difference between an amplifier that I'd rewired, and one that hadn't been. The difference was

incredible. The soundstage had more life and depth, and all from about two feet of wire. The customer wasn't quite so outspoken after that!"

The speakers partnering the A250s are Celestion 3000s. Not the revised 8 ohm version, but the original silver fronted 4 ohm models. At 86dB sensitivity the 3000s don't represent a particularly easy load to drive, but for an amp that's capable of driving the infamous 1 ohm Apogee Scintillas, they are chicken feed!

I must admit that the speakers have never been great favourites of mine. Mainly due to the ponderous bass and strange imaging. However, through careful choice of cable (Hardcore on the bass and Indigo Blue on the ribbon) including

rewiring the bass unit with Ortofon SPK 100 and removing some of the cheap wadding, Glenn has succeeded in integrating the bass with the ribbon unit quite effectively. They are also mounted on Foundation FRED stands, filled with a mix of sand, lead shot and polystyrene, rather than the awful plastic affair that Celestion passed off as dedicated stands at the time. By the time the Celestion stands had been bolted together they were too high and swayed around like The World Trade Centre in a force nine.

But despite being carefully tweaked, the bass unit simply can't live up to the excellent midrange/top ribbon unit. It is, after all, the same 8inch unit that graced the budget DL8s. Needless to say, Glenn was looking for a replacement or even a

suitable subwoofer. Although as I write he tells me that they have now been replaced by a 6 3/4" fibreglass woofer that tightens the bass up considerably.

So why did Glenn choose the 3000s in the first place? "The type of music I play is mostly progressive folk and female vocalists. For this type of music the superbly smooth and integrated mid and treble suit me down to the ground." Listening to the 'speakers can prove a strange experience; especially when standing up. The Thousand Series never did make the best choice for the party animal, as the treble from the ribbon tweeter completely disappears when you listen from above.

The C.D. player is a bit of a rare bird too, despite being relatively cheap at £300. At heart the machine is based on good-old Philips technology (surprise, surprise!), and the actual spec. is rather like a slightly breathed upon Rotel 955. Having said that, the AMC CD6 looks as if it costs

that everyone who had listened to the clarifier had noticed a difference; another product to help dispel myths about tweaking, then.

Down towards the left speaker looms a truly awesome beast of a tuner, The Trio KT917 was supposed to cost about £800 new and according to Glenn, "it was better than the equivalent Revox in its day, but lost out because it had no presets, and, most crucially, couldn't turn a mast rotor."

Even so, at £60 it was something of a steal, even though it does look archaic. It proved to be exceptionally sensitive, pulling up to 95% signal strength on a T.V. aerial, and offering a very natural, almost valve like sound. Glenn's cassette deck, the NAD Monitor Series 6300, has always been something of a favourite of mine, offering Nakamichi sound quality for a near reasonable price. The reason it failed was because at around £600 it was bang in the middle of Nak. territory, yet looked

and felt no different from other NAD equipment. But three heads, dual-capstan transport and Play Trim combined to make it a stonkingly good deck. Glenn had returned to the NAD, after having a Nakamichi cassette deck 2, because he

missed not

having Play Trim and, like me, appreciates the unfussy NAD Monitor styling and lack of gimmicks (trendy remote control excepted).

The main source for the system is a Michell Syncro turntable. Again, this is another piece of equipment that is often overlooked by press and public alike. Originally, the Syncro came with a Michell badged Rega RB250 arm. That has since been replaced by an Audio-Technica AT-1130, with the useful feature of height adjustment. This makes a good home for either the Audio-Technica AT-F3 Stillton, or Ortofon Quartz cartridges that Glenn uses. Finishing touches include a Michell record clamp, cartridge leads from an Ortofon MC 3000, Heybrook support and quality silver plated interconnect. "Turntables are highly critical to setting up and tweaking. As it is now, my Syncro can show a clean pair of heels to a neglected Gyrodec/RB300."

Garrard 301 and 401 turntables seem to be in strong demand at the moment, and Glenn is not alone in seeking out a fine example that can be 'breathed upon'. However, Glenn is unaffected by the rivalry between 301 and 401 aficionados.

"Either model will do me, but whatever happens it will be fitted with the Audio-Technica arm (an excellent combination), at least until I can afford an SME IV or V by some means!"

Between the Michell and Cambridge amps sits an intriguing PS Audio moving coil step-up device that has an outboard PSU made from, of all things, an old transformer from a NAD C.D. player. It was the extra bass depth from the tweaked PS Audio that finally led Glenn to ditch the DL8 loudspeaker drive units and plumb for something a little tighter.

As I look around the room I spot an old Leak Vanislope pre-amp and TL-12+ power amp: "If I can find another three TL12s, then I might be able to have valve amplification after all!"

Switching on the power-amps evokes a loud 'pop' from each 'speaker. Apparently that's quite normal, and hints at the menacing power (and current) available.

Looking around the room I'd spotted several Enya posters and the like, so I was expecting something suitably 'folky' to be played on the system. In fact 'The Kane Gang' provided the first insight into the system, with smooth and natural vocals portrayed by the ribbon driver. Using one drive unit with no crossover to cover both mid and treble really does give the 3000s superb transparency. One of the down sides of this, though, is that with the crossover point occurring between bass and mid notes (in the region of a low piano note, for example) it can sound a little stifled.

The imaging takes a little getting used to, and if you're not dead centre, the sound takes on a boxy nature. These are 'hotspot' 'speakers with a capital "H"; you can't stand up, move around, or listen properly to the speakers if there's more than one of you! It's not hard to see why these speakers were controversial at the time, although they are 'audiophile' (read, demanding yet rewarding) in the true sense of the word.

'The Frazer Chorus', on vinyl, revealed more depth and a thundering synthesized bass line that gave the album the grunt and authority it demanded. Yet I couldn't help feeling that the midrange was somewhat swamped by the forward and overblown bass. Still, according to Glenn, the fitment of the new fibreglass woofers has addressed this problem, leading to a tighter more controlled bass.

So there you have it - a guide to the sort of system that somebody who sells hi-fi equipment owns. Notice the complete lack of 'Best Buy' products, and also that the equipment is often far from being the latest and greatest. This is quite typical of those who work in the hi-fi trade. Although some retailers will have a system that comprises the best equipment they sell, something I've commonly found is that many have the most basic or ancient of systems. A case, I think, of the Cobblers children wearing worn out shoes ●



Glenn's lone TL-12+

two or three times the amount.

It was chosen over Rotel, Pioneer and Marantz rivals due to its 'big boned sound quality.' This preference is obviously a hang over from Glenn's previous amplifier, a Musical Fidelity BI.

As you may have guessed, its been subtly tweaked. The underside of the clamp has been filled with Blu-Tack and Sorbothane used on the top, as well as various contact points on the lid, to damp resonances. The whole of the draw has been painted with a green pen (to absorb stray light from the laser) and Monster damping rings are used on every disc. The support is something of a mammoth affair too. Four large spikes hold a 55mm thick chunk of Medite (an old Sansui display item, believe it or not), cushioned from the C.D. player with more Sorbothane.

The interconnect used is Omega Mulgrave (solid core) and as a final touch, Glenn uses a Bedini Compact Disc Clarifier. I was extremely sceptical of this device, which is essentially a Zerostat costing a hundred quid. However after a couple of discs had been spun, I was quite impressed by the extra weight and depth given to the soundstage. Glenn confirmed

Most tuners these days are full of air. Two chips and a couple of bits of wire practically make up the whole total of what is inside. Rotel, with the Michi RHT-10 have chosen to be different. Less air inside this heavy case with glossy cherry-coloured end-cheeks, means more outside. Airy, spacious, alive - that sums up the RHT-10's sound.

While the other matching Michi components - the disc stage, pre-amplifier and power-amplifier reviewed not long ago could be accused of having a somewhat 'laid-back', but very finely detailed presentation, the new tuner bares all, with no artificial restraint.

And I mean bares all. The RHT-10 belongs up with the Audiolab 8000T, and the long-standing broadcasting reference (and mine) Quad FM4. Good old GLR transmitted a taped interview with an electronic hum behind it: for five minutes I hunted around my cabling for the source before the interviewer said 'Bye', the tape stopped, and the studio background became silkily silent. While we're on the subject of studio cock-ups, the Rotel displayed with unerring clarity the fact that some fool engineer had re-balanced a

recording of Scheherezade leaving a hole in the middle of the orchestra, compressing it at both ends, and even, somehow, managing to reverse left and right.

In the meantime, however, despite a thinned-out violin tone as a result, the brass and woodwind were both well-rounded and the engineer at least hadn't destroyed a spacious and deep acoustic environment. Voices, while we're at it, had been extremely natural when un-interfered with: a trait the Rotel retained through Rock, Latin music, opera, interviews - everything. No undue sibilance, no grating edges, clear differentiation between tenor and baritone voices, no artificial chestiness or nasality.

In fact, the Michi had that most excellent of all attributes - shut your eyes and it disappeared. If you thought about it, certainly the bass response was somewhat light compared to primary sources, and the treble - while clear and clean for a tuner sounded less extended than CD (probably due to transmission filters-NK).

None of these inevitabilities of the tuner kingdom detracted from the Rotel's fluid, rhythmical performance, whether it

was avant-garde jazz on Jazz FM, Latin music on GLR or Rachmaninov on Radio 3 - the latter was broadly-spaced, with tremendous attack - very 'live' - allied with excellent depth of staging. I listened to Latin music on GLR for nearly an hour before I remembered I loathed it: maraccas rattling, guitars with a marvellous twang, plucked mandolin vivid and clean in attack, vocals a little closer to the mic than on the FM4, but splendidly exciting. Also, technically, as lucid as the portrayal of the music: there were one or two unmistakably so-so early Sixties recordings in this set.

When GLR turned to live Rock, the Michi didn't flinch: it plays a catchy, tight tune, maintains a strong beat, and displays almost effortless power. Literally, as it happens, a bit too much electrical power: the output is high, and I could barely turn the Argo pre-amp volume control beyond nine o'clock without risking disco deafness. For much of the listening I fed the Michi through a passive pot direct into a stereo Alecto power amplifier.

It is as at home with grunge guitar as it is with acoustic; as much at ease with MC anybody - though I am not! - as an opera

READING THE AIRWAVES



Eric Braithwaite enjoys the truthful presentation of Rotel's new Michi RHT-10 tuner.

singer. Checking out live opera on Radio 3, as it happens, did bring to light one of only two areas of performance I could bring myself to criticise. The stage was remarkably broad - a little over-spread compared to the FM4, and the clumping of boots as singers and chorus tramped about the stage more pronounced. A little heart-searching into the Rotel's sonic performance left the impression that the mid-range had a tinge of euphonic emphasis compared to either the FM4 or the Audiolab 8000T - which is so totally lacking in anything of the kind it can sound too clinically, unnervingly accurate.

It gives Rock music punch, however, while not allowing the dreadful compression on some stations to unbalance the music completely. There is just enough emphasis to stop the mid-range being swamped by this horrible

effect. Here, the Rotel's lighter bass helped as well.

The second reservation was to do with Classic FM, London's current bugbear. Scanning through the stations, loading them into the sixteen preset

“ In fact, the Michi had that most excellent of all attributes - shut your eyes and it disappeared.”

memories using the remote control, the Rotel unerringly homed in on the strongest transmitter, no matter what it was, even picking up some of the weaker local radio stations in the home counties. Classic FM, however, was markedly subject to burbling (and I don't just mean the presenters) even with a six-element aerial some fifty feet up in the air (this was due to breakthrough from another station, as a result of poor selectivity-NK). The FM4

dealt with this better as, from memory, did the Audiolab and the Quad 66FM

Here is the crunch, of course. Rotel's RHT-10, at £895, is more expensive than either the Audiolab 8000T (which also offers by far the best AM section currently available) and the Quad 66FM. The latter is also remote-controllable, though if bought without the accompanying control-unit, the expense of a remote handset brings the two closer. But the RHT-10, with its rolled-gold fascia and presenting a clean and elegant face to the world, can hold its head up high in this company ●

Rotel Michi RHT-10 £895
Gamepath Ltd.,
25 Heathfields Stacey, Bushes,
Milton Keynes,
Bucks. MK12 6HR.
Tel: 0908 317707

MEASURED PERFORMANCE

Rotel have produced an unusual tuner here, one that is conspicuously poor in certain areas of measured performance. This suggests that they have taken a conscious decision to live with the outcome of their circuit design approach, since the company are as capable as anybody of connecting up the usual bundle of off-the-shelf vhf/fm silicon chips which, nowadays, ensure a near-perfect measured performance, if not the same state of perfection in sound quality.

There's no mpx filter as such, an unusual omission these days, allowing 19kHz pilot tone and 38kHz subcarrier through. At -50dB or so, I suspect pilot tone cancellation has been used, not now a popular technique. This is much like other Rotel tuners I have tested in the past, the filter being omitted in order to extend audio frequency response right up to 20kHz, as our response analysis clearly shows. Normally there is a brick-wall plunge in output above 16kHz but the Michi is only -2dB down at 20kHz. I'd expect this to make the treble sound clear and pure, but pilot tone could well be troublesome, especially when tape recording, since it can hang up Dolby, which sees a low level signal even when there's no music.

Distortion was as low as is possible these days, which says a lot for Rotel's discrete decoder design. However, whilst channel separation was potentially high at around 60dB, pilot tone phase adjustment was a little out, bringing the measured figure down to 30dB. This affects sound quality little, however.

Noise sunk to an adequately low value of -73dB with an aerial signal of 600µV or more, a good result that will allow the RHT10 to make the most of mediocre aerials; it was sensitive on mono and stereo

signals. However, selectivity was decidedly mediocre, at 50dB on Wide IF and 67dB on Narrow IF, poor results for a modern tuner. Eric heard this manifest itself as burbling breakthrough from another station in use.

The signal strength meter was poor for a quality tuner. Rotel have fitted a simple, uncalibrated counter that runs from 0 up to 7, even though the handbook thinks the maximum is 5 (?). Nowhere in the handbook is any interpretation of its readout offered, nor anything else useful. We are told only that 0 is the weakest signal and 5 the strongest - blinding!

In fact, measurement showed that the tuner reaches full quieting (minimum hiss) when 7 lights up, but at 6 is as hissy as cassette without Dolby. Values 0-5 show only that the aerial signal is too weak for anything like true high fidelity to be obtained, so five readout levels all mean the same thing. I find this sort of thing very disappointing, indicating lack of design rigour or simple inability to appreciate the value of facilities provided, which suggests they have been included without thought.

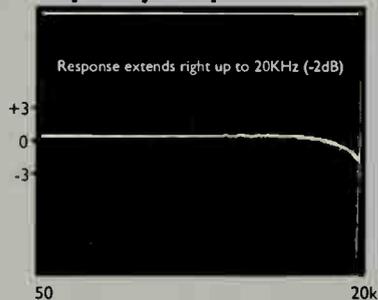
In spite of some disappointing weaknesses, the Michi tuner measures well enough to be able to provide good sound quality. But it does have some stiff competition from other models, notably from Audiolab, Quad and NAD, all of which offer an equivalent or superior measured performance. **NK**

TUNER TEST RESULTS

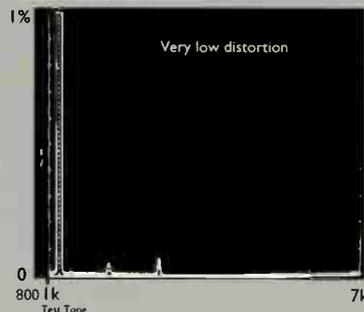
Frequency response (1dB)	2Hz-17kHz
Stereo separation	30dB
Distortion (50% mod.)	0.07%
Hiss (CCIR)	-73dB
Signal for minimum hiss	0.63mV
Selectivity (at 0.4MHz)	50/67dB

Sensitivity		
mono		1.6µV
stereo		25µV
signal strength meter		
	LED No.	level (µV)
	1	0.4
	2	0.8
	3	2.5
	4	8
	5	32
	6	63
	7	630

Frequency Response



Distortion



How strange to discover that feedback is unnecessary and that a good amplifier will sound better without it. Older readers commonly tell us that "it has all been done before" and that the 'back to valves' movement is anachronistic. This isn't so and the shaming and disappearance of feedback illustrates that there exists today a fundamentally different outlook toward the use of valves, one that is radically different to that which existed in their day. That's what I want to cover here.

Let me start with an appropriate analogy. Motive power and the industrial revolution were once the province of the steam engine. Then we discovered petrol held more energy and, instead of lugging around a trailer of fossil fuel behind the engine, we could get vast power from a small lump of iron and an equally small tank of fluid.

Yet the steam engine still has merits and it could find use again today. No-one would expect us to return to traction engines or steam engines as they were, but a good argument could be made out for returning to them in a new improved form, which could provide us with certain significant benefits judged valuable by today's requirements.

So it is with valves. Whilst there are many vintage enthusiasts around, generally speaking, modern valve designers are not trying specifically to cater for them. The use of valves has not arisen out of a desire to "get back to the old days" for its own sake, but to harness the innate and considerable abilities of valves to better serve modern amplifying requirements. The subject of feedback - or the lack of it - well illustrates how and why a different breed of amplifier may be due, based on valves or possibly, different forms of solid state device.

There's been a change of outlook and it's informative to explore its history. Back in the thirties, amplifiers produced distortion and struggled to

provide a flat frequency response. It's understandable that engineers of the period should harbour a notion of perfection that specified a perfectly flat frequency response across the audio band and zero distortion. This was in the days before feedback had been invented, so distortion could be reduced only by designing and producing progressively more linear valves.

Then Harold Black - doubtless amongst others - discovered feedforward and feedback around 1939. With

feedback, gain was swapped for low distortion and this led to a change in approach. Higher gain valves were needed, but distortion became less of a worry, hence the emergence of the pentode. The transistor merely took amplifier design further along this path, until a time arrived when perfection could finally be attained. In my experience, that point was most firmly and unequivocally reached by Hitachi's HMA7500 MOSFET amplifier launched, if my memory serves me well, around the end of the 1970s.

I measured it - and it was perfect. I listened to it and thought "ho hum - so this is what perfection sounds like!". This amplifier sounded no different or better than any other solid state amplifier. In fact, it sounded quite flat, dry and uninteresting.

At this point the audio industry had, in effect, reached a dead end in amplifier development. Conceptually, there was - and currently is - nowhere left to go. Or is there?

We've been busy further honing our 300B amplifier, a design that uses valves designed before feedback



means use it if that's what you want (we switch it in or out) but, generally, a highly developed, innately linear design sounds more open, spacious and dimensional without it.

So our giant, heat producing, 300B valve amp - one of architectural proportions - is not a return to the old days. It's an interesting view on what we may have to look toward in the future if amplifiers are once again to make progress in sound quality. We use old valves because they are, for historical reasons, free of distortion. Others may soon

Reflections from Noel Keywood kaleidoscope

came into common use. As a result, these valves - America's finest - were designed to be inherently linear, or distortion free. In 300B we've carried out some linearising improvements and have now come up with a design that doesn't need feedback at all. Finely tuned output transformer load matching, plus a better driver valve with higher current delivery and lower distortion have yielded an amplifier that sounds better without feedback than with it.

And it is this new proposition that I find fascinating. Amplifiers don't need feedback! By all

start to consider making solid-state amplifiers that can, hopefully, exhibit the same benign distortion behaviour of a well designed 300B amplifier so that feedback can finally be abandoned. Engineers may have to re-apply themselves to age-old problems such as low power output and high output impedance, but we have already shown that these problems are soluble too. But the lesson is that feedback is not helpful to the goal of perfect sound reproduction; quite the reverse, it is a sign of inadequate basic design. Tomorrow's amplifiers should do without it ●

EDITORIAL ASSISTANT

Getting busier and busier daily, we are looking for another editorial assistant. A good background of experience in hi-fi is needed, plus respectable educational qualifications, particularly in English. We want someone who can listen and write, as well as organise. If you can handle a professional camera, so much the better.

In the first instance, please write, enclosing CV and/or details to

EDITORIAL ASSISTANT VACANCY
HI-FI WORLD
64 CASTELLAIN ROAD,
MAIDA VALE,
LONDON W9 1EX

In last month's column, I wrote about the audible differences between the various types of analogue interconnect cable. I argue that it's not so much the cables themselves that cause perceivable audible effects, but their interaction with the other pieces of equipment in the complete hi-fi system. In the process of comparing the effects of cables upon the different types of preamplifier, I explained how active preamplifiers, as well as passive "preamplifiers", are prone to the effects of cable capacitance.

That passive attenuator type "preamps" are affected by cable capacitance is well known. However, they are - at least - affected in easily predictable ways. Unfortunately, the same cannot be said for the effects of cables upon active preamplifiers where - amongst other things - the reduction of stability margins can cause unpredictable changes in frequency response when partnered with high capacitance cables.

Now, I make no apology for my own prejudice for passive preamps. My own home hi-fi system contains nothing more than a CD transport, a DAC, a home-built Class A power amplifier and a pair of loudspeakers. My requirement for a preamp is therefore minimal to say the least and a simple attenuator volume control is all I require. Nonetheless, several months ago I became increasingly aware that my original home-built passive-preamplifier was susceptible to cable capacitance effects which were causing a slight dulling of the sound due to very slight high frequency roll-off.

So, I set about finding a solution to this problem which didn't involve "going active". The preamp design I arrived at is the subject of this month's column. As usual in engineering, a little lateral thinking pays dividends, and the result is a design for a completely passive unit which largely

sidesteps all the effects of cable loading whilst maintaining the huge benefits of passive preamplification, namely simplicity and transparency.

The idea came to me that it's possible to isolate the effects of cable capacitance on the passive attenuator control by considering what is done to isolate similar effects in measuring apparatus. For instance, the designers of oscilloscopes know well the effects of high-frequency distortion due to the cable connecting the measuring



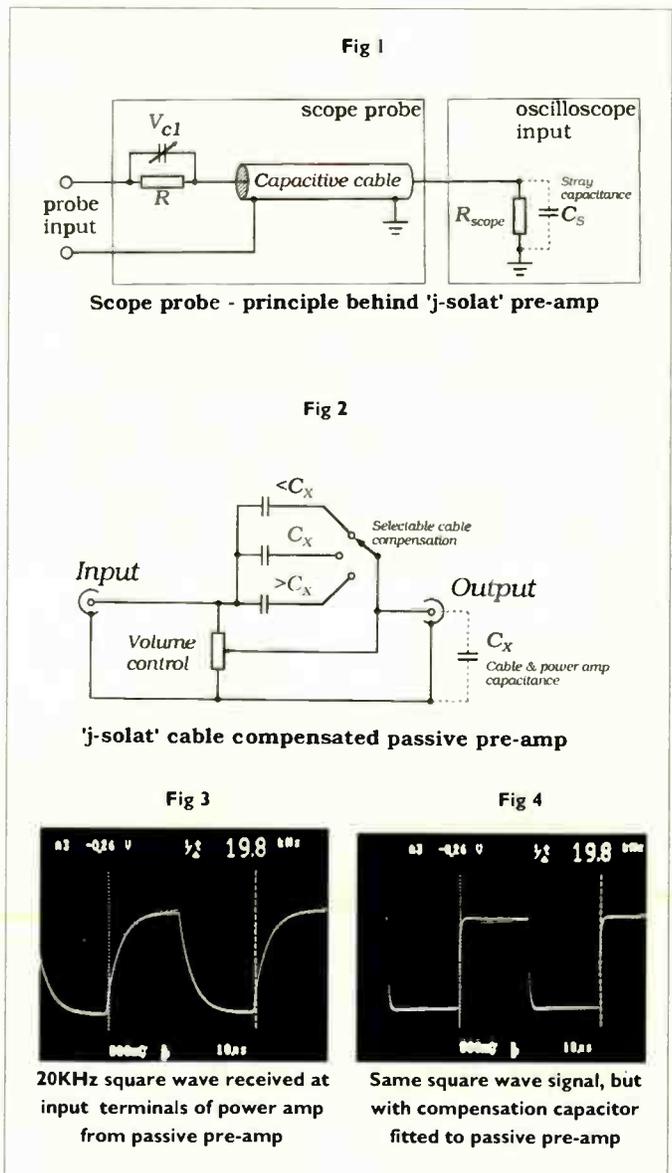
4 illustrates the same signal with the addition of the compensating capacitor. Only a trace of phase distortion remains.

Subjectively? Well, initially I detected a slight increase in airiness and space around the individual instruments when the compensating capacitor was installed, but returning to the unmodified condition proved quite intolerable after having once been exposed to the improvement a "cable compensated" passive preamplifier can bring about ●

recorded message

Left by Richard Brice

probe to the oscilloscope display itself and they use a cunning technique to make the cable "disappear" in electrical terms. The wonderful feature of the circuit they employ (see Fig. 1) is that, by the introduction of the variable capacitor VC1, it is possible to "tune out" the effect of the cable. My own preamplifier design (Fig. 2) operates on the same principle: one of the switched capacitors C1, C2, C3 is chosen to best compensate for the effect of the following interconnect and power amplifier input capacitance. The best value is determined either experimentally or by audition. (The only disadvantage is that the value must be chosen for particular settings of the volume control - I chose three capacitor values to compensate for cable effects at: 1) a typical low-level, background level setting, 2) at a normal listening level and 3) at party level! Figs. 3 and 4 demonstrate the remarkable improvement this simple modification can bring about. Fig. 3 illustrates a 20kHz squarewave as received at the input to the power amplifier without cable compensation and Fig.



It's now three years since Hi-Fi World first graced the bookshelves, and this last year has been the best so far. The changes all started with the first DIY Supplement, planned as a one off at the time! Noel and I half killed ourselves building and writing for the first one; there were several moments when we feared it couldn't be done in time.

Here we are a year on and we've just completed a run of three supplements in a row followed by our biggest ever main issue of 148 pages. Next month we continue with the DIY Supplements, bi-monthly, for another year, or at least that's what's planned. I would tell you what designs we have for the next year, but that would spoil the fun. (Oops, I've just read Noel's 3rd anniversary history article and he's already blown it: yes, there is a 300B parallel-single-ended amp on its way, not for April, but maybe for June).

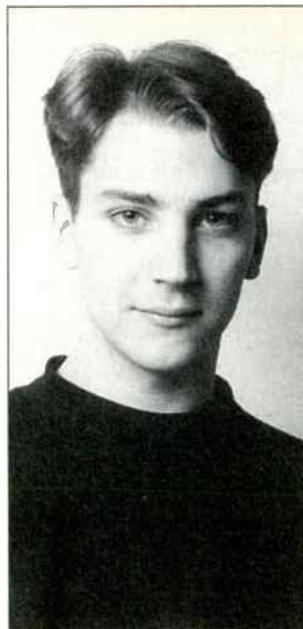
While we're on the subject, the 4W single-ended integrated amplifier kit should be available in time for the next issue. It will have three line level inputs and a tape out, and the price is expected to be around £390. This will include valves, high quality Alps volume control, a new special custom gold plated input selector which will also be used on the pre-amplifier shortly and, of course, superb transformers.

The effect of our supplements has been quite stunning. Back in November we received figures from W H Smith's wholesalers showing us on a strong upward climb and the majority of our competitors struggling. Not bad for a small team of three determined hi-fi enthusiasts and four hard working believers, against the publishing giants of Haymarket, Dennis and Link House. This is mainly thanks to you, our readers. The letters you send provide much of the inspiration for the articles we write and are a great encouragement.

These figures gave us the incentive we needed. Everyone was looking a

little tired and in need of a good holiday, but this was enough to persuade the troops that there really was something worth fighting for. And that's what we are doing. We started last year with a 122 page March issue and are now about to kick off the next with 148 pages and a series of 32 page supplements throughout the year. This coming year we intend to offer our readers more reading matter than ever before, and once again ignore conventional publishing outlooks.

We do things a little differently here. Whereas



Dominic Baker

dB on the level

the other magazines will drop their pages right down below ours during the summer months when sales are low, and increase them again during the 'promo season', usually from October through to March, we aim to offer consistent value throughout the year. Our page numbers steadily increase throughout the year, for as we scrape together pennies, they are quickly spent on improving the value of the magazine.

Our supplement is seen as a promotion to any other publisher, that is, they think that we write a supplement so that more people buy the magazine because it has something free on it. What they don't realise is that it is the subject that matters, not the free gift. Our supplements have done well because people are interested in their content, they aren't just attracted because it's something for nothing. I'm a strong believer that our readers are more educated than that, they don't want a free plastic thingamijig, or a CD which contains music that they might not be interested in. They want something more to read, something entertaining, better value

for money. If I buy a magazine, I don't look for a free gimmick, I look at its content, what it has in the way of interesting reading material.

Anyway, here's a brief idea of what the months of '94 will bring in terms of equipment. The biggest range of new equipment is undoubtedly going to come from Mission with their new range of electronics. This includes a two-box CD player, integrated amplifier and tuner to start with. All of the new Cyrus electronics use a special casting to form part of the chassis making them strong and solidly built. And I must say we can't wait to get hold of some of the new range, they are superbly built.

Also making our mouths water at the prospect is DPA Digital's first discrete CD convertor, joining Pink Triangle's Da Capo. The pdm ten-twenty-four will not be cheap, around £6000, but the design promises outstanding results. We hope to bring you this in the May issue as an exclusive to Hi-Fi World. Could CD start to get close to vinyl in the high end?

Tannoy have found a way to produce a subwoofer

using motional feedback - something which Noel and I have both experimented with. Motional feedback uses a second voice coil on the drive unit to provide a signal which is fed back into the power amplifier, correcting distortion. The result is amazingly powerful and articulate bass devoid of colouration. The price is unknown as yet, but hopefully it will be reasonably affordable.

While we're on loudspeakers, ProAc have added the Studio 200s to their range, and after the superb results we got from

the 100s, I'm looking forward to these. Hopefully, we will be able to get hold of a pair in time for the next issue. And one of my favourite loudspeakers is to make a reappearance later on in the year, the Townshend Glastonburys. The originals combined the Tonigen ribbon tweeter with a small metal bass/mid driver to give sweet treble with a clear midband and really deep bass. Hopefully the replacement will continue these strengths.

On the amplifier scene there is a new integrated from Heybrook joining the increasingly crowded £500 integrated amplifier market. This area of the market has seen a lot of attention during the last few months with the addition of Naim's Nait 3, Linn's Magik and Triangle's TE-60 to name but three. On the valve scene, there is Tube Technology's purposeful looking Synergy, and again we hope to bring you this soon.

So the year's off to a good start, the magazine is bigger, the DIY supplements continue and there's plenty of interesting equipment around. Keep the letters coming ●

Well, I've been at it again. Just two months after my wallet, and inbred sense of thrift, fell for a classic Revox tuner I've been on the spend again. This time, though, the culprit was a real bargain.

Thirty pounds for a pair of hand built loudspeakers of no known identity could have proved a bit of a risk. But I knew I was on to something when the old guy who was selling them for a pair of NAD 802s said "They're a bit too tinny for me, and tend to force the music at you." It was hardly surprising he'd found them tinny, as I latter discovered them to be horrendously inefficient; even more so than my SL600s. I suspect that driving these 'speakers with a Leak Stereo 20 would have caused them to be rather bass light to say the least.

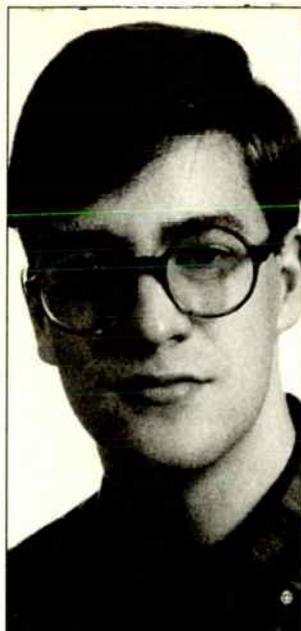
The cabinets impressed too. They're about the size of Ruark Swordsmans. Nice and deep, yet narrow for good imaging and neatly finished in walnut veneer, with textured black front and rear panels. Although the cabinet came sealed, there's the unusual feature of being able to remove a medite bung at the rear of the cabinet, revealing a 5 inch plastic port. The entire cabinet is built from 20mm medite and internally veneered for extra strength.

Poking about inside revealed more surprises too. The hard-wired crossover featured gold plated bi-wirable terminals and fair quality components. Best of all was the fact that the drive units were in fact Morels, as I'd hoped. An MDT30 tweeter and MW166 woofer unit were tightly secured via long bolts and padded tape. Better still, the date on the drive units revealed them to be less than a year old.

Over £120 pounds worth of drive units, solid hand-built cabinets, good quality bi-wirable crossover, 11 months old, and all for thirty quid. What would they have cost new? All things considered, probably between £400-£500. Well that's depreciation for you! If these 'speakers were a car

they'd be a Fiat Croma Turbo. Despite feeling guilty about paying so little for them, they, like the Croma, aren't a recognisable quality brand. No matter how good they might be there's no name on them. This means that when they're sold, your average punter would shy away. No badge that their friends told them was a "good name." No glossy advertising. And no reviews, good or bad.

But as with any £400-£500 'speaker there have to be compromises, and these Morel equipped 'speakers have plenty of those. Still,



Fair Views

- from Dominic Todd, our man in Scarborough

all the more fun as at just £30 they make excellent guinea pigs to try out various tweaks on.

So, following on from last month's C.D. tweaks, here's a few tips, that I've tried on my latest acquisition, for tuning up your 'speakers.

First to go was the cheap 'speaker cable used internally. What's the point

using silver solder.

Next to be outed was the dreadful "egg box" foam damping. To the protests of a technician who's a friend of mine, I ripped it all out. "You don't want to rip that out, it's designed on a computer." So what? What's the point of leaving it in there when it sounds useless. Replacing the foam with a little glass fibre wool

by those with shaking hands. Remove the tweeter face-plate and very carefully coat the inside surface of the metal dome with ink from a marker pen. There are normally three or four screws holding the face-plate to the magnet assembly which have to be carefully removed. Remember that there is a large magnet around and if you let go of a metal screw it's likely to aim straight for the fragile dome causing irreversible damage.

The ink adds mass to the dome, there by taming some of the shrillness associated with metal domes. Do be careful though, and don't forget that if anything goes wrong it will almost certainly invalidate the manufacturers guarantee.

Again, as with last month, this is just a small selection of tweaks (most of them already well established). But if you feel your 'speakers aren't quite giving their best, give some of these and other tweaks a try. All bar the metal dome tweeter tweak are reversible so, should you find any of them unbeneficial, it's easy enough to return to the original spec. As the commercial goes - try it, you might like it ●

"Over £120 pounds worth of drive units, solid hand-built cabinets, good quality bi-wirable crossover, 11 months old, and all for thirty quid."

of using the latest "ultra low colouration" 'speaker cable if, when the signal reaches the terminals, it has to travel through a foot or so of 79 strand or worse? It doesn't need to be expensive, either. I used Ortofon SPK100 cable throughout, which brought about a smoother, more detailed treble, tighter bass and a less forced and harsh midrange. If the wires are connected to the drive unit via push-on clips, then there's an opportunity here to attach the new cable properly

(loft insulation to you and me) at the top of the cabinet, totally transformed the balance of the 'speakers. From sounding rather flat and lifeless, they took on a whole new sound that was fleet of foot in the bass department and much more open through the mid-range. There was more depth to the soundstage too and they appeared to go louder for the same volume setting.

My attentions then turned towards the treble. Placing a piece of felt or velvet around the metal face

WIN ONE OF 3 A AMPL

To celebrate our third anniversary, this month we've decided to give away not one, not two, but (as you'd expect) three superb Class A Sugden A21a amplifiers, each worth £500.

The A21a is a fully integrated amplifier complete with an excellent Moving Magnet (MM) disc stage for all those vinyl addicts out there. It also has inputs for CD, tuner and two other line level sources, as well as a tape monitor - useful if you use a three-head tape deck.

The A21a is a Class A design pushing out a modest 24watts, so some care with loudspeaker matching will have to be exercised, but those few watts do something really quite special. Both Noel Keywood and Eric Braithwaite agreed that the A21a is one of the very best transistor amplifiers they have ever heard, regardless of price.

Eric Braithwaite, who had a particular affinity for the A21a (both being of

Yorkshire origin) was impressed by the apparent power and authority of this amplifier, commenting in the review "Whatever is played through the A21a is invested with flesh, blood and lungs".

To enter this fabulous competition for three Sugden A21a Class A amplifiers, complete the questions on the entry form opposite. This month the winner will be picked from the hat, just get the questions right and you're in with a chance.

Please send your entry on the form, on a postcard, or the back of a sealed envelope, and completed in block capitals, to arrive no later than Monday 7th March 1994 to:

SUGDEN Competition
Hi-Fi World Magazine,
64 Castellain Road,
Maida Vale,
London. W9 1EX.

NAIM/EPOS COMPETITION WINNER NOVEMBER ISSUE COMPETITION

Mr D. Desmond of Crewe in Cheshire was the lucky winner of Naim's new NAT-03 tuner, Nait 3 amplifier and Epos ES11 loudspeakers. All he needs now is a first rate aerial to bring the broadcasting studio into his home.

ROSE/HARMAN KARDON WINNER DECEMBER ISSUE COMPETITION

The Rose RV-23S valve/transistor pre amplifier, RP-190 power amplifier and a pair of Harman Kardon LS 0300s have found a good home with Mr P. Bowden in Kent. Mr Bowden was just about to upgrade his amplifier, so the prize couldn't have come at a better time.

CHRISTMAS COMPETITION WINNERS JANUARY ISSUE COMPETITION

We had an absolutely massive response for our Christmas Competition in which four complete systems could be won. Here are the lucky winners:

1. £700 Vinyl System
Project 2
Ortofon MCI turbo
NAD 304
Celestion 3s
Winner: Simon Pulman-Jones of London

2. £700 CD System
Yamaha CD-X570
Rotel RA-935BX
Mission 760iSEs
Winner: Mr G. S. Douglas of South Humberside

3. £1500 Vinyl System
Michell Mycro
Goldring 1022GX
Denon PMA-350II
Spendor SP20s
Winner: Janet Newman of Birmingham

4. £1500 CD System
Philips CD930
QED Digit & Positron
AMC CVT3030
Harman Kardon LS 0500s
Townshend Seismic Sink
Winner: Martin Phipps of Bristol

COMPETITION ENTRY FORM

1) What Class of operation does the Sugden A21a work in?

- | | |
|-----------------------------|----------------------------|
| <input type="checkbox"/> AB | <input type="checkbox"/> B |
| <input type="checkbox"/> A | <input type="checkbox"/> C |

2) How powerful is the A21a?

- | | |
|-----------------------------------|-----------------------------------|
| <input type="checkbox"/> 14 watts | <input type="checkbox"/> 24watts |
| <input type="checkbox"/> 34 watts | <input type="checkbox"/> 40 watts |

3) What do the A21a and Eric Braithwaite have in common?

- | | |
|------------------------------------|---------------------------------|
| <input type="checkbox"/> Yorkshire | <input type="checkbox"/> Weight |
| <input type="checkbox"/> Power | <input type="checkbox"/> Ears |

4) Including tape, how many inputs does the A21a have?

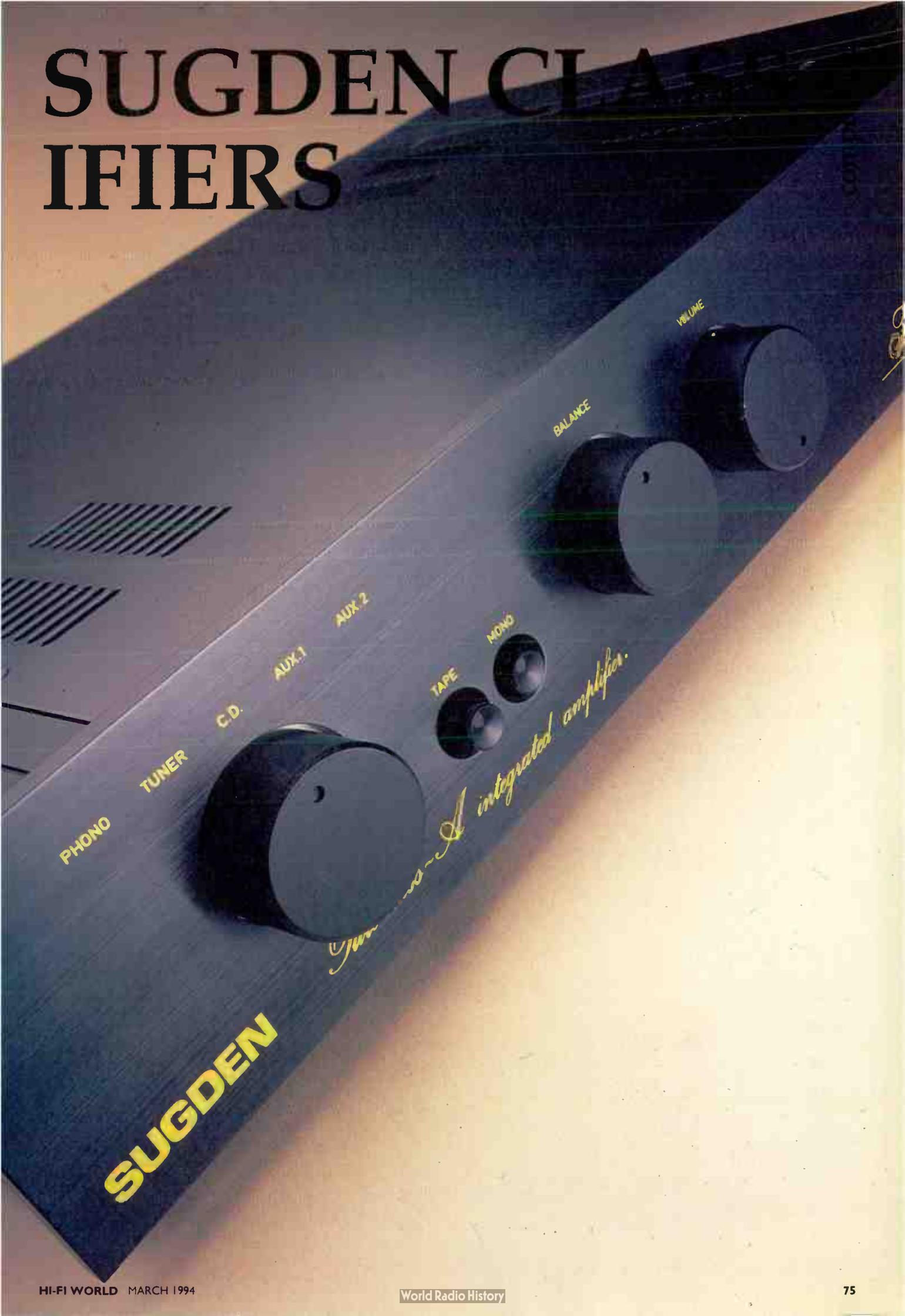
- | | |
|----------------------------|----------------------------|
| <input type="checkbox"/> 3 | <input type="checkbox"/> 4 |
| <input type="checkbox"/> 5 | <input type="checkbox"/> 6 |

In the event of more than one entrant submitting all the correct answers, the winner will be picked at random. We will endeavour to publish the results in the May 1994 issue. Purchase of the magazine is not a precondition to entry.

No correspondence about this competition will be entered into and the Editor's decision is final.

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

SUGDEN CLASSIFIERS



THE MUSIC DADOS

Giovanni Dadomo



THE SHAMEN
Different Drum
TPLP 42 CDR

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RECORD MAIL ORDER120

successful 'Boss Drum' long-player. It's a scenario already well familiar to 12-inch buyers, where alternative mixes of every shape, length and colour are no new thing, but it's most likely been the province of the hard-core fan, and this is likely to be the same with long-players like 'Different Drum'.

I'm not the world's biggest Shamen fan by any means, so I doubt if I'd buy this. On the other hand it has to be said that one can have plenty of fun comparing the two discs. The title cut here is crisper and rides a tougher groove than its predecessor, as befits a radio mix, while 'phorever people' too is a snappier, somewhat zingier affair than before. But to these Techno-insensitive ears a lot of the songs are neither better nor worse than before - the best thing about 'comin unstrung' is its wacky title pun (think about it) and no amount of re-shaping can really enhance the ultra-dull psychedelic nonsense that is the spoken part of 're:iteration', although the version without the voice 'de:evolution', is more tolerable for cutting the verbosity and concentrating on its pulsing bass and didly synth backing.

Seems it won't be long now before we'll be able to do our mixes at home. This then is probably just a transitory phenomenon, and as such ultimately redundant except for the aforementioned hard-core collectors - them and those Shamen followers so wrecked they'll buy 'Different Drum' thinking it's a new Shamen opus. It is and it isn't.

● In the wonderful world of the movies we now have the Director's Cut; in pop it's the re-mix album. What we have to ask ourselves is this: are we actually being offered a bona fide alternative item of product, ie. the goods as the 'artist' originally conceived of them, or is this just a cheap and cynical marketing ploy, ie. a way of extending a piece of product's, ahem, shelf life by giving it a slightly different complexion to the one it first hit the market-place with? I mean, is there really that much difference between 'Blade Runner' the movie and the director's cut?

By the same token what we have here is a number of alternative - and out - takes from the Shamen's already highly

VARIOUS ARTISTS
Stone Free - A Tribute To
Jimi Hendrix
 REPRISE 9362-45438-2

● The all-star tribute thing can be a hit or miss affair at the best of times, but this one looked like a risky venture from the off. After all, Hendrix was such a distinctive and original artist that it would seem madness to try and compete with him on his own turf. Or would it?

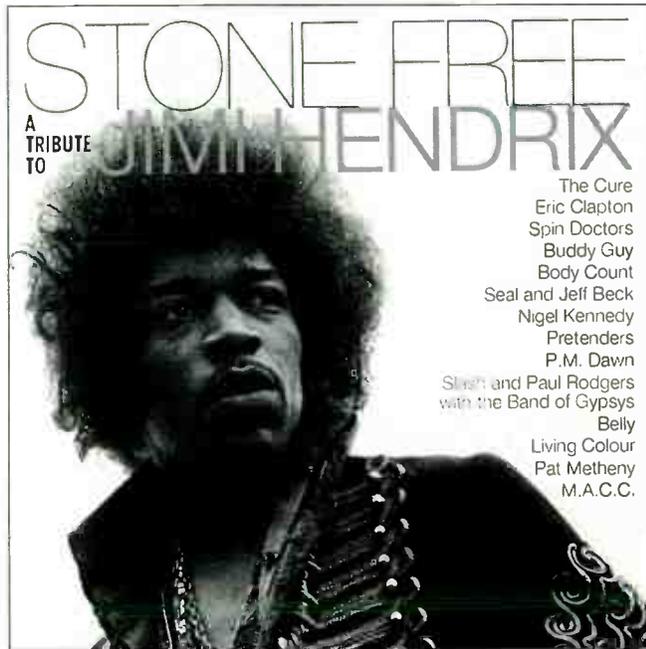
Well, believe it or not, it actually works, give or take the odd minor misjudgement. This is all the more surprising considering what a motley crew stares out from the sleeve credits, from Hendrix' own contemporaries - Clapton, Beck - to young bloods like P.M. Dawn and Body Count, and nigh on everyone in between.

But for the most part, it works remarkably well. There's Eric Clapton in best blues fettle for a sturdy 'Stone Free', Jeff Beck ringing the

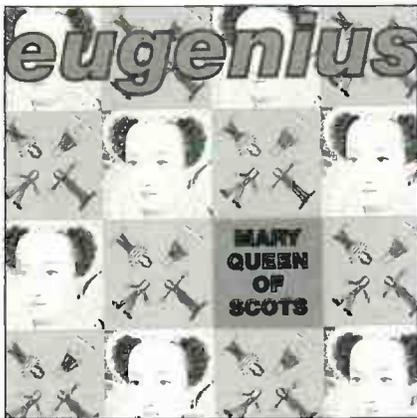
changes alongside Seal's splendidly gritty-some vocals on 'Manic Depression'. And Ice T proves he's no mean singer with

into 'You Got Me Floatin' without compromising their own brand of spaciness one jot. Another happy welding is the combination of Slash, Paul Rogers and the original Band of Gypsies for a rippingly good 'I Don't Live Today'. Others who shine include Chrissie Hynde's Pretenders who take on the faff from easy to follow 'Bold As Love', The Spin Doctors 'Spanish Castle Magic', and Belly with 'Are You Experienced?'. The Cure are, er, The Cure on the opening 'Purple Haze'. I can't really listen to Robert Smith's misery-powered griping without thinking of Newman and Baddiel nowadays, but it's not bad at all, while Nigel Kennedy ('Fire') is a love him or hate him kind a guy, ditto Pat Metheny - and this guy's not in love with either. But overall this remains one of

the best, most refreshingly different tribute compilations yet. Oi'll give it four point foive.



'Hey Joe' - a song that, with its cargo of guns and anger, fits very neatly into the 'gangsta' ethic. Similarly P.M. Dawn slip



EUGENIUS
Mary Queen of Scots
 AUGUST RUST 008 CD

● Scottish musicians have been as fanatical about the Velvet Underground over the years as their Paris or New York counterparts - Postcard Records, a great early indie label, even used to boast that they had a band based on every phase of the Velvet's life. They certainly prove part of the inspiration for Eugene Kelly and his band, with his penchant for sturdily monotonous rhythms overlaid by blizzards of wild guitars, and semi-spoken vocalese.

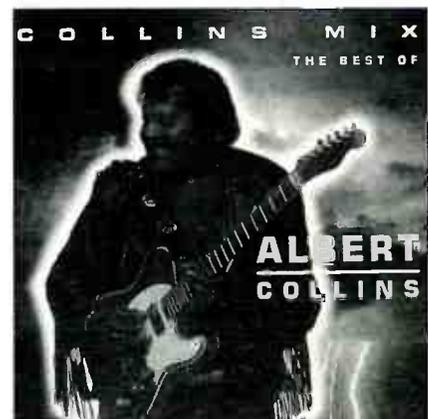
But it'd be a sin to tar this wild and witty combo with the old 'Velvets copyists' brush. There's a lot more to them than that. Items like the title cut and 'On The Breeze' are definitive examples

of contemporary indie guitar rock, the latter topped off with a catchy singalong chorus of the sort Graham Nash used to produce so effortlessly for the Hollies. They can be wackily psychedelic, as on 'Friendly High', with its avalanches of sound, clever trick ending and such delicious lyrics as "I've left my socks burning at home", or its companion piece, 'Fake Digit', which sucks the blood of The Soft Boys with great wit and imagination. Yeah, this is some groovy disc, pop pickers - prick up your ears!

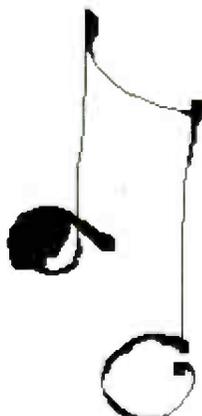
ALBERT COLLINS
Collins Mix (The Best Of)
 VIRGIN / POINTBLANK 7243 8 39097 2 8

● I'm A bit late with this one but I'll make no apologies, since Texas blues master Albert Collins passed away just

before Christmas and the world will be a sadder, colder place without him. Collins started making records in the early Sixties and enjoyed similar up-and-down fortunes as the rest of the blues fraternity. But he never sold out or changed his totally distinctive style of playing and singing, which seems to have arrived fully



formed on his first hit 'Frosty' a good thirty years past. It's just tragic that he didn't live to really profit from the current blues boom. Still, he did get to record this spirited run-through of some of this classic material, featuring an excellent band as well as contributions from the likes of Gary Moore and B.B. King. He was a consummate stylist, as well as a witty writer and performer: anyone who saw him live will testify that this man really could make his guitar talk, even if



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World Radio History

Rock & Pop

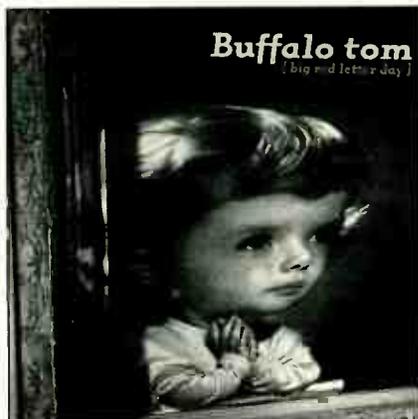
some of the things it said could be rather, ahem, vulgar. Check out the cool and extremely varied sound of AC, from laid-back, after-hours, clubland blues ('Don't Lose Your Cool', 'Mastercharge') to big band workouts like the 'Collins Mix' medley. One of the greats, indoubtably.

SHONEN KNIFE
Rock Animals
AUGUST RUST 009 CD



● Kurt Cobain's tip for success in '94 release their second UK long-player. They're three young women from Osaka, Japan - Naoko Yamano, guitar, bassist Michie Nakatani and Naoko's sister Atsuko on the drums. Theirs is a spirited not to say driven rock'n'roll stew, all Daffy Duck vocals, rioting guitars and thundering percussion. I don't know about you, but I've always been a sucker for young women with foreign accents and Shonen Knife's vox are no exception.

Sexism aside, this is a stonking, rockin' pop confection, from the grunting 'Johnny, Johnny, Johnny', and 'Quavers' (it's "I quiver" they sing, surely?) to 'Butterfly Boy', with its neat tinkerbell keyboards, sensual vocals and mad, bad, dangerous guitarings. Other standouts include 'Tomato Head' - "before I go to sleep in bed / I only wanna be like Tomato Head" ...don't ya just love 'em? And on 'Another Day' they sound like the Beach Boys in a mono studio, 'Concrete Animals' is a thunderstorm looking for a flight, and the flat but highly endearing vocals of 'Brown Mushrooms' have only to be heard once to induce massive feelings of love and loyalty. Lovely jubbly.



BUFFALO TOM
(Big Red Letter Day)
BEGGARS BANQUET BBQCD 842

● This is the second long-player from an appealing trio out of Boston, USA, featuring writer/singer/guitar and keyboard man Bill Janovitz, bass/guitarman Calbourn, and Tom Maginnis with the drums and percussion. Now if you like more or less traditional rock'n'roll as exemplified by, I don't know, say Neil Young or Tom Petty even, then this band could well be your cup of tea.

They kick in with a great song, 'Sodajerk', which deserves to be a hit on this or any other world, while there's some rather forceful jangling to be heard also on items like 'Tree House' or 'Dry Land'. 'Torch Singer' does indeed carry more than a hint of Neil Young's fingerprint and 'Suppose' is as solid, gnarly and stomping as they come. Personally I'd never have put something as slow and dull as the, er, slow and dull 'I'm Allowed' after that stunning opening cut, but this is still the sound of a potentially primo combo and, as such, ought not to be sniffed at.

Eric Braithwaite

JANIS JOPLIN
Janis
COLUMBIA/LEGACY C3K 4845

● It's hard to credit a generation has passed since Janis Joplin died. It's equally difficult to rationalise why, in the last twenty years, I've hardly played a single Joplin track. More fool me.

This three-CD box set changed that. It's not your average 'bundle three LPs together and flog 'em all over again' marketing ploy. Yes, the set includes 'Pearl', with The Full Tilt Boogie Band, 'Cheap

Thrills' with Big Brother and the Holding Company and 'I Got Dem 'Ol Kosmic Blues Again Mama' with The Kosmic Blues Band - all the great stuff. But it's all put together with care and cleverness, the LP tracks interspersed and completed with alternative takes, unreleased sessions, some of the singles and live recordings (like the Monterey Pop Festival or the '69 Ed Sullivan Show pieces) we haven't heard before. It makes one hell of an experience.

Joplin wasn't a writer, but she re-wrote the way you listen to other people's songs. Listen to the Pearl tracks and you realise she drove the music she sang - and drove the band as hard as she drove herself, to the uttermost limit. Forget all about that shrieking, raucous, hoarse voice that's at first hard to take. Just listen to the way every word is infused with raw communicative emotion.

What she had - and it only happens once in a generation in any music - was an instinct about phrasing and rhythm that injects the meaning of the music right into the cortex. Try her version of Gershwin's 'Summertime': she made it a new rock classic.

She knew what she was doing; she listened to Bessie Smith, fathomed out how her phrasing worked and put it into a Rock context. One of the eye-openers of the first CD is 'What Good Can Drinking Do', just her and autoharp from '62 that shows her with a primordial feel for the Blues tradition. There's an acoustic first take of 'Me and Bobby McGee', less musically consummate than the one that appeared on Pearl, but which demonstrates how she could use her voice to drip meaning and rip, tear and tug at the heartstrings through every word.



Sonically, it's a treat as well. It's been sensitively re-mastered using Sony's 20-bit recorders, and the engineer has resisted the temptation to trick-up the original tapes with fakery - even to the extent of not removing tape hiss on a piano track, or the odd extraneous noise.

Forget the screwing around, the bloated appearance, the nasty death at the end. I didn't weep over that as I did twenty-four years ago. I wept over all that talent concentrated in one voice, because we don't hear it enough in Rock even yet. Buy this set and celebrate it.

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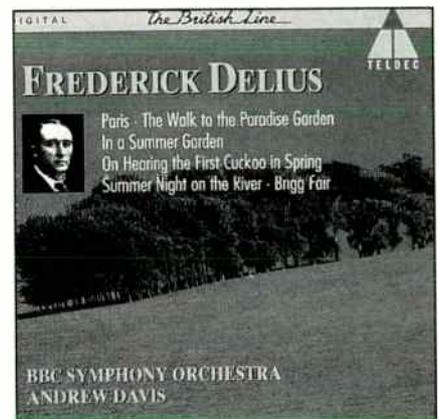
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NAIM AUDIO NALMCD003 (ADD 71.05)

● 'Concerts under the Dome', from which this CD also takes its title, is the name given to series of chamber music recitals which have been staged for the past three years (and continue to be staged) in the Ascension Church in Oak Park, Illinois in the United States. However, this recording, which draws upon concerts taped in May 1992 and January and May last year is very much an Anglo American effort, with the final mastering being undertaken by Julian Vereker of Naim Audio. He took the original analogue tape, which was engineered by Ken Christianson of ProMusica, Chicago, and using a Naim analogue to digital converter coupled to a CD recorder produced a recordable CD. This was then played on a Naim CDS to make a production master. An interesting process which has resulted in a sound which is full, warm and immediate, with truthful tonal balance and inner detail; it also happens to be a very satisfying seventy minutes' worth of music-making. The audience applause is retained - and why not? These are after all concert performances - but for the most part its presence is unobtrusive.

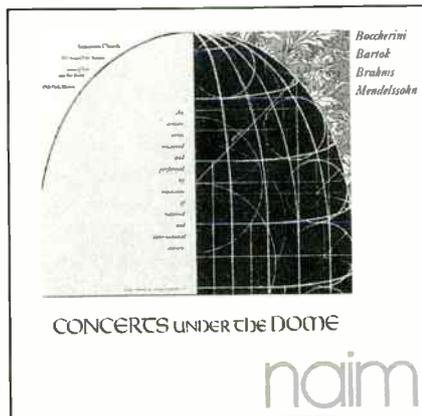
'Concerts under the Dome Inc' is very much a showcase for new performing talent, giving young performers the chance to work together in different sized ensembles and, hopefully, inspire each other. Which is certainly what occurred in the sparkling performance of Mendelssohn's lyrical and radiant Octet, which contains some of the sunniest music imaginable. The opening allegro is all good natured warmth, with a glorious main theme, while the scherzo fizzes with impish humour and the concluding presto exudes energy and a tongue-in-cheek grandeur. There is also a poetic

performance of Brahms's Op 114 Clarinet Trio and exuberant playing of Bartok's Romanian Folkdances, with that great cellist, Janos Starker, in fine form. The Boccherini pieces I found less persuasive but, taken overall, the programme is enormously satisfying and the production exemplary. More please, Julian.



FREDERICK DELIUS Paris, The Song of a Great City; In a Summer Garden; Brigg Fair: An English Rhapsody; The Walk to the Paradise Garden (from A Village Romeo and Juliet); Two Pieces for Small Orchestra: On Hearing the First Cuckoo in Spring; Summer Night on the River
BBC SYMPHONY ORCHESTRA;
CONDUCTOR, ANDREW DAVIS
TELDEC 'THE BRITISH LINE' 4509-90845-2 (DDD/77).

● Including as it does works such as Brigg Fair and In a Summer Garden, this generously-filled Teldec issue could hardly be bettered as an introduction to the music of Frederick Delius. But, for me, the highspot is an all-too-rare recording of one of the earliest of Delius's major orchestral works, his vividly colourful musical portrait of Paris. Delius lived in the French capital for some twelve years, becoming very much part of its bohemian artistic life. In Paris, The Song of a Great City, his desire to express what excited him about the city coincided perfectly



LUIGI BOCCHERINI Adagio and Allegro from Sonata in A Major
BELA BARTOK Romanian Folkdances
JANOS STARKER, CELLO; REIKO SHIGEOKA-NERIKI, PIANO
JOHANNES BRAHMS Trio for Piano, Clarinet and Cello in A Major Op 114
JOHN BRUCE YEH, CLARINET; MARC JOHNSON, CELLO; ANDREA SWAN, PIANO

My dictionary defines minimalism as music based on the repetition of short figures, adding that a notion of process comes through gradual change within ostinato textures. It goes on to say that the basic process has proved capable of elaboration and cites the operas of Philip Glass as a prime example. And it was through one of his operas, *Akhnaten*, that I became convinced that Glass had more to offer than I had first anticipated.

Philip Glass was born in 1937 and studied at the University of Chicago and at the famous Juilliard School of Music in New York. He also studied with Nadia Boulanger in Paris and, while there, also worked with Ravi Shankar. It was Indian music that became his starting point for working with slowly-changing ostinato patterns. He went on to form his own

ensemble to perform his music but more recently has explored the medium of opera with works heavily reliant on techniques of chant and repetition. These include *Einstein on the Beach*, premiered in Paris in 1976, *Satyagraha* and *The Photographer*, both given their first performances in Rotterdam, in 1980 and 1982 respectively, and *Akhnaten* (Stuttgart, 1984).

The term 'ostinato' comes from the Italian for 'obstinate' or 'persistent' and, perhaps better known as the 'ground bass', has been a fundamental 'building block' of composition for several centuries. The idea of a repetitive bass line underpinning thematic variations on the upper line dates back to the earliest instrumental consort music and has been used at one time or another by

just about every major composer, Bach and Handel being perhaps its best-known exponents. Philip Glass and his fellow 'minimalists' such as Steve Reich have not so much invented the technique as adapted it. Glass, especially, has done this most successfully, not least because he has made the technique the servant of his own innate, and considerable musical gifts and fertile imagination.

As I discovered with *Akhnaten*, an exploration of Glass's music can be immensely enriching. But where to begin that exploration? Sony Classical has now provided an ideal 'entry point' and, while I normally dislike 'samplers', I have to say that this compilation has been assembled in such a way as to be a most coherent and persuasive showcase.

PHILIP GLASS
The Essential Philip Glass
 VARIOUS PERFORMERS
 SONY CLASSICAL SK64133
 (DDD71.52)

● The thirteen tracks on this disc come from recordings made between 1979 and 1989 and include The Philip Glass Ensemble's own recording of arguably the best-known of the composer's instrumental pieces, the haunting, hypnotic *Facades* which has found itself more than once adapted for televisual use. There are three excerpts from *Satyagraha*, all featuring the superb tenor voice of Douglas Perry in the New York City Opera production. A six minute extract from the lengthy *Kuru Field of Justice* is included alongside *Protest and Evening Song*. From another of the operas, arguably Glass's most substantial achievement to date *Akhnaten* come the ravishing *Hymn to the Sun* and the rapturous *Window of Appearances*, both displaying a consummate mastery of vocal and instrumental writing, especially for the woodwinds. Counter-tenor Paul

Esswood is the superb soloist in a recording made with the Stuttgart State Opera, Orchestra and Chorus and, in the scoring of these extracts, an affinity with the music of the Estonian Arvo Part, is readily discernible.

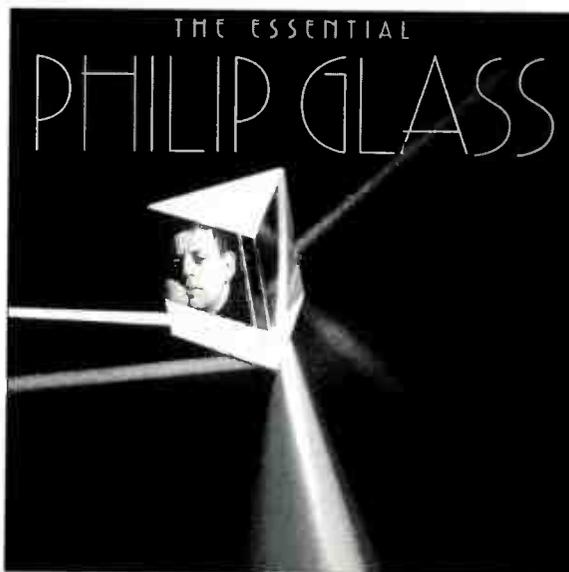
The compilation opens with three of Philip Glass's collaborations with

on *Changing Opinion*, which features the voice of Bernard Fowler, with Michael Riesman on piano and Paul Dunkel on flute. David Byrne, late of Talking Heads, co-wrote *A Gentleman's Honor*, which is performed by the Philip Glass Ensemble.

From the album *Dance Pieces* comes *Dance 8*, with its beautiful string writing overlaying an ostinato piano part that seems to pay homage to J.S. Bach and from Glass's solo piano album the composer himself plays the spell binding *Metamorphosis Four*, a sublime set of variations and surely one of the most original piano pieces of recent times.

The remaining items are a solitary excerpt from *Einstein on the Beach*, the succinctly-titled *Bed*, and the instrumental ensemble piece *Closing* which, appropriately concludes this musical portrait of Glass's career to date, a career which promises to develop excitingly and influentially. The overall technical quality of this compilation is high, with the recordings of the *Akhnaten* excerpts and *Dance 8*

and *Metamorphosis Four* being especially fine. It has proved a most pleasurable and enlightening expansion of my musical horizons; yours, too?



artists from the world of popular music. Janice Pendarvis is the soloist in *Lightning*, co-written with Suzanne Vega; Paul Simon was the collaborator

with his lengthy formative period as a composer. Here, he combines his innate poetry, passion and melodic gifts with the deft and brilliant handling of the large orchestra which he developed from studying the scores of Richard Strauss.

Delius classified the work as a nocturne and said it described his impressions of night and early dawn, with

particular emphasis on the city's characteristic street cries. Certainly those impressions are dazzlingly conveyed here, as Andrew Davis displays the kind of empathy with Delius's music as he did with that of Vaughan Williams earlier in this welcome series from Teldec. And every department of the BBC Symphony - an orchestra not always given its due I

feel - relishes the sonic riches on offer in the score.

In his succinct, but nonetheless illuminating booklet note, the composer's one-time amenuensis, Eric Fenby comments:

"In the best of Delius we are made one with nature. No man has given musical utterance to all her moods, but in the

expression of her tranquilities, he excelled all others."

Who could dispute that, listening to the delicate webs of sound that Delius fashions in *Summer Night on the River* or *In a Summer Garden*, the latter an impression of the garden at Grez-sur-Loing which was lovingly made and tended by the composer's long-suffering wife, Jelka. Both are beautifully played here, their finely-detailed textures atmospherically captured by Tony Faulkner's recording.

The Norwegian composer, Edvard Grieg, was one of Delius's staunchest supporters and it is from the former's Op66 collection of Norwegian folksongs that Delius takes the simple, yet enchanting theme for *On Hearing the First Cuckoo in Spring*. It is an exquisite miniature, magically evoking a landscape slowly awakening out of the winter darkness. Another close friend of Delius was the Australian composer, Percy Grainger, and it was Grainger's choral setting of the Lincolnshire folksong, *Brigg Fair*, which prompted Delius to develop the tune into one of his best-loved compositions. This 'English Rhapsody', as he subtitled it, is most affectionately played here, as is the lyrical *Walk to the Paradise Garden*, a concert piece plucked from Delius's fourth opera, *A Village Romeo and Juliet*. It completes a persuasive showcase for Delius's often elusive art.

GIOVANNI PIERLUIGI DA PALESTRINA

Missa Benedicta Es; Missa Papae Marcelli; Missa Nigra Sum; Missa Brevis; Missa Nasce La Gioja Mia; Missa Assumpta est Maria; Missa Sicut Liliun inter spinas

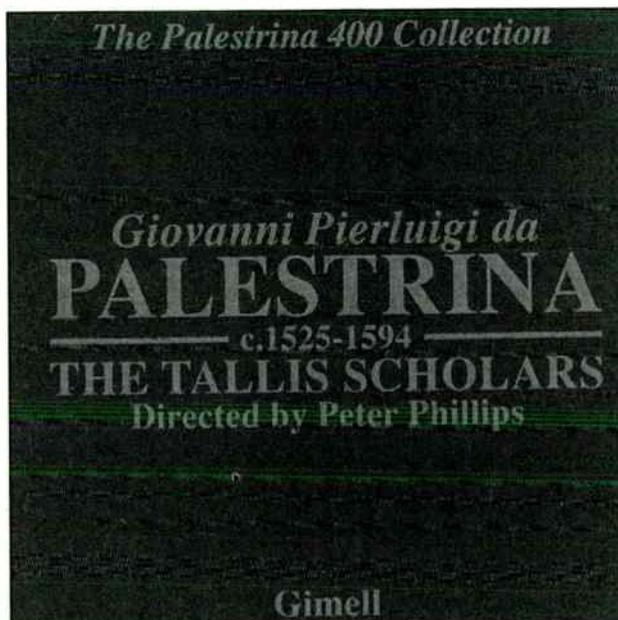
THE TALLIS SCHOLARS, DIRECTOR, PETER PHILLIPS

GIMELL CD GIMB400 (14 CD SET) (AAD/DDD/240. 09)

● February 2, 1994, marks the four-hundredth anniversary of the death of that most accomplished master of the art of polyphonic choral writing, the Italian Giovanni Pierluigi da Palestrina. The occasion is being commemorated in Rome, in one of the churches in which Palestrina was choirmaster for part of his career, Santa Maria Maggiore. But the performances of his music will not be by an Italian choir, but by Britain's Tallis Scholars, a reflection of the international status which Peter Phillips and his colleagues have attained in recent years. The concerts, surrounded by the Renaissance splendour of Santa Maria Maggiore, promise to be magnificent occasions and it was encouraging to learn that they are being taped for both audio and video release.

The Tallis Scholars association with Palestrina's music stretches back over a decade and in that time the choir has

not only recorded such well known Mass settings as the *Missa Papae Marcelli* and the *Missa Brevis*, but offered pioneering performances of others from among the 104, that Palestrina produced. As with the William Byrd anniversary last year, the choir's label, Gimell has assembled all the Palestrina recordings on to a splendidly-produced four-disc package, attractively priced at £32. As a means of exploring the music of one of the most fertile minds of the



Renaissance, it stands head-and-shoulders above all competition.

Born around 1525, by his late teens Palestrina was organist and choirmaster of the cathedral in his native city of Palestrina, from which he took his name. When his bishop became Pope in 1551, he moved to Rome along with him and became choirmaster of the Cappella Giulia in the Vatican. He is also known to have sung in the choir of the Sistine Chapel before being dismissed - for unknown reasons - from Vatican employ. He then became maestro di cappella of, first, St John Lateran and then Santa Maria Maggiore. In 1557, he entered the service of Cardinal Ippolito d'Este and four years later returned to the Cappella Giulia.

Following the deaths of his wife and two sons during epidemics in Rome, he vowed to enter the priesthood yet a few weeks later married the widow of a rich fur merchant. Her fortune allowed him to spend the rest of his days in comfort and to publish no fewer than sixteen collections of his music, a compendium which places Palestrina at the very pinnacle of the polyphonic choral style of the Catholic church.

The earliest of the Mass settings here, the *Missa Benedictus Est*, displays an already secure compositional technique and, especially in the *Credo* and *Sanctus*, a sense of lofty grandeur. As was common at the time, it takes an existing work - in this case Josquin

Desprez's six-part Christmastide motet *Benedictus Est* - as its basis and quotes from it. The original motet is appended to the Tallis Scholars' recording of the Mass.

The *Missa Nigra Sum* is a similar parody Mass, in this case based on a motet by a French follower of Josquin, Jean Lheritier. The performance, again, is revelatory, benefitting from Peter Phillips's insistence on clarity and his - and his singers' - constant awareness and

appreciation of Palestrina's word-painting. The most profound statements of the Mass - the *Et Incarnatus est*, for example - are always by music of sublime intensity.

A madrigal, *Nasce la gioia mia*, by the Neapolitan composer, Giovan Leonardo Primavera, was Palestrina's starting point for another of his finest parody Masses but the *Missa Sicut Liliun*, with its bold harmonies and rich texture, and the sumptuous *Missa Assumpta est Maria* both draw upon

motets by Palestrina himself. The survey is completed by the magnificent *Missa Brevis* and by the most famous of the Masses, the *Missa Papae Marcelli*. This was the work which, according to legend, kept music alive at the height of the counterreformation. At the time, many Catholic clerics argued that the sinuous complexity and sensual beauty of much sacred music was detracting and even obliterating the fundamental aim of transmitting the Biblical texts. It is said that the serenity, translucency and apparent simplicity of the *Missa Papae Marcelli* persuaded the cardinals that great music was compatible with delivering the religious message.

But there is no requirement to be of any religious persuasion to enter into the devoutly spiritual yet often intensely emotional and even anguished world of Palestrina's music. It is music which reaches both heart and mind, given sympathetic and enthusiastic interpretation. Which is what the Tallis Scholars have consistently offered. The earlier recordings, made in the glorious acoustic of the chapel of Merton College Oxford, have been seamlessly remastered from the original analogue to accompany the two all-digital discs, one - again - from Merton College, the other made at Sale Church in Norfolk. John Milsom contributes a trenchant assessment of Palestrina's style and achievement to complete an illustrious commemorative tribute.

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Sonic Link Violet £80

Violet cable works well in high quality systems- where information retrieval is a priority. Despite having warmer, fatter bass than Pink or Red, it remains exceptionally clear and detailed,

Verdict ★★★★★☆

especially in the mid range and treble. Music's upper registers are very delicately portrayed but instruments nonetheless have a reassuringly solid feel. Not suitable for ragged-sounding systems

Sonic Link Pink £25

Verdict ★★★★★☆

This ultra-slender cable looks unconventional and home-brewed, but it does offer a respectably detailed and cogent sound. Pink's tonal balance is rather light, due to its lean, dry bass, but it doesn't sound too forward in a well balanced system thanks to very refined treble and good overall clarity. In fact this cable's fast, rhythmically urgent sound is very appealing.

Sonic Link Red £45

Verdict ★★★★★☆

Just like Pink, Red is also skinny, but packs loads of musical information into its slim and modest diameter, recommended as a CD to preamp link, red is vividly detailed with a vibrant and lively tonal balance, which is aided and abetted by good dynamic contrast and slick timing. Provides bass with far more substance and weight than the less pricier Pink leads

Sonic Link Blue £120

Verdict ★★★★★☆

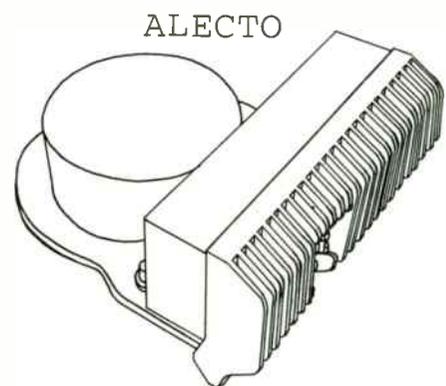
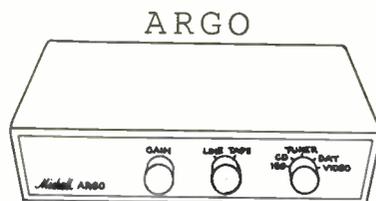
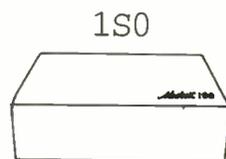
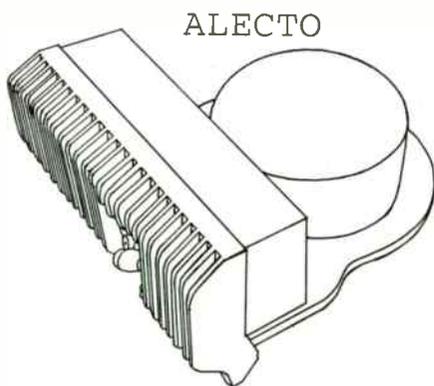
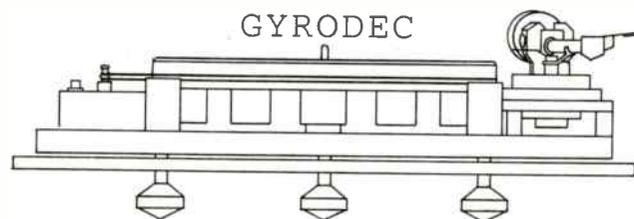
Blue uses Sonic Link's rhodium plated plugs, which are claimed- and certainly seem able to out perform the more common gold plated variety. Blue has a very clean and spacious sound that captures low level detail very well. Like the Violet cables though, it can be too revealing for a system.

Sonic Link Black £150

Verdict ★★★★★☆

A heavyweight, even by Sonic Link standards, this cable uses silver plated cable and rhodium plugs. Its sound is weighty too, but bass sounds over bloated, slowing lively music right down. We still prefer the cheaper Blue cable, which gives bass lines more intonation and flow, resulting in the music seeming faster and better articulated overall.

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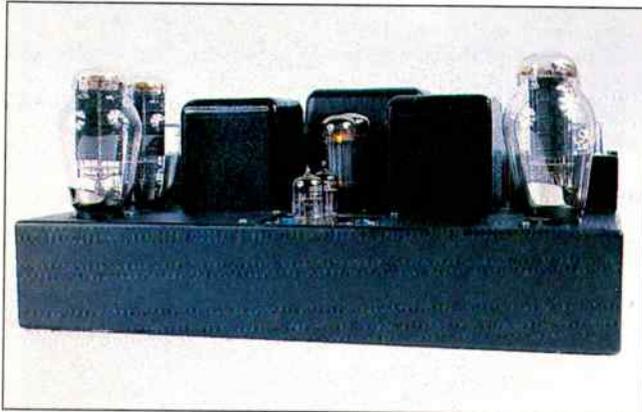
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All parts are included in the kit, except valves since different 300B makes are available.

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Frequency response	5Hz-36kHz
Distortion	0.2%
Separation	54dB
Noise (hiss/hum)	-100dB/-72dB
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See page 91 for order form...

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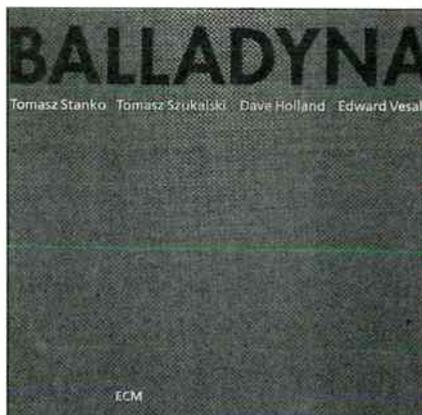
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Simon Hopkins



TOMASZ STANKO **Balladyna** ECM ECM 1189

● A whole bunch of cool reissues from ECM recently, including Paul Motion's fantastic album *Tribute* and *Tin Can Alley* by drummer Jack De Johnette's group *Special Edition*. Pick of the bunch in this hack's entirely biased opinion is *Balladyna*, by the Finnish trumpeter Tomasz Stanko.

The album, dating from 1976, featured fellow Finns Tomasz Szukalski on tenor and soprano saxes and Edward Vesala on drums, and the English bassist and ECM stalwart Dave Holland. This is fantastic music, full of blistering solos, enchanted arrangements (Vesala's drumming always sounds like a fanatical experimenter let loose in a percussion museum), heart-stopping, folkish melodies and brash rhythms. The flip side of the Euro-jazz coin from *Karyobin* or *Machine Gun* or *Gyatso* (although how many sides can a coin have?), this is music at once beautiful and angry and compulsive. Essential.

SPONTANEOUS MUSIC **ENSEMBLE** **Karyobin** CHRONOSCOPE CPE2001-2

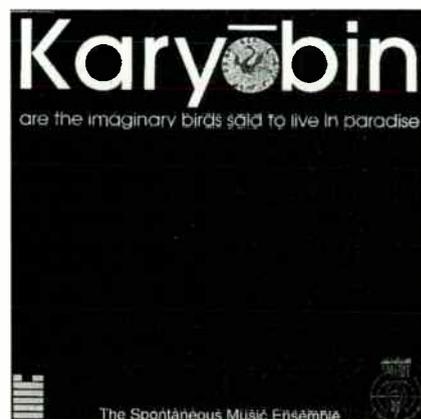
● It's 25 years since the release of the Spontaneous Music Ensemble's second LP *Karyobin*. A great deal has happened in contemporary music - and especially in improvised music - in that time, so much so that it's sometimes difficult to imagine its impact.

Drummer John Stevens had formed the group in 1965, as a loose collective harnessing the incredible talent and hugely ambitious aims of some of the musicians kicking around the the fringes of the British jazz scene of the time. Their debut 1966 LP *Challenge* had already established the group's objectives and unique style (for although this group's music became increasingly non-idiomatic, it was always uniquely - and unmistakably - their own).

Karyobin went further, and although it's now easy to hear this as coming out of the jazz tradition (something not generally acknowledged at the time) it still represents the ultimate development of the small jazz group: a logical conclusion, but a conclusion nonetheless. Post-*Karyobin* SME would move somewhere else entirely, so as Robert Wyatt observes in the sleeve notes to this CD reissue, *Karyobin* really was an end and a beginning: a turning point. And not just for the SME; Dave Holland would go directly from the SME to Miles Davis and the influence of *Karyobin* is writ large over Davis' work at the time, *Paraphernalia* and *Double Image* especially are the closest Miles ever got to *Free Jazz*.

In fact, this line-up of the group - Stevens, Holland, Wheeler, Parker and Bailey (it was actually the last two's first ever recording) - while regarded with hindsight as pretty much definitive, was actually exceptionally short-lived. Wheeler and Holland have, of course, moved on to much more mainstream success; Bailey and Parker continue to develop this music with a commitment

that beggars belief - and with an endless ability to conjure up beautiful and intelligent music; and founder Stevens (whose since worked with artists as diverse and acclaimed as Jack Bruce, John Martyn, John Lennon and Yoko Ono - herself a one-time SME member), always a mercurial virtuoso, and certainly one of



the finest jazz drummers this country has ever produced, has steadfastly kept his feet in many camps. All their paths have criss-crossed continuously over the last two and a half decades, but the music they made on *Karyobin* - for so long unavailable - remains quietly monumental.

This is the debut release for Chronoscope Records - "a hardcore label dedicated to past, present and future music" according to their press release - and certainly bodes well for their future.

16-17 **Gyatso** PATHOLOGICAL PATH 12CD

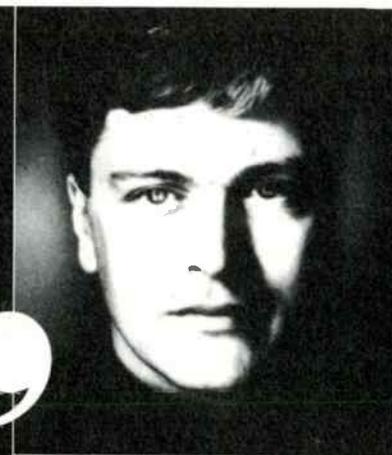
● It's a bit of a truism in jazz criticism that a record like *Karyobin* represents a strictly European kind of jazz music, a music which might have developed out of the basic principles of American jazz, but, by the mid 60s, had shorn itself of any sense of swing or blues.

But inevitably, this is an oversimplification. Much of the new jazz music made in Europe in the 60s - and I'm thinking now of the blistering, excoriating music being made by the likes of Peter Brotzmann and Han Bennink and Fred Van Hove and so on (Brotzmann's seminal *'Machine Gun'* is about as fine - and as noisy - a statement of their aesthetic as you could hope for) is as far from the intent behind *Karyobin* as any American jazz.

And in truth, continental Europeans remain extremely adept at turning out very noisy improvised music. For one thing, Brotzmann et al are still making a fine racket. And even peaceful Switzerland manages to turn out groups as blazing although very different - as *Alboth!* and *16-17*, whose *Gyatso* appears on the relaunched *Pathological Records* this month.

So, *16-17* are an improvising sax-guitar-drums trio led by saxophonist and bass clarinetist Alex Buess, a man who

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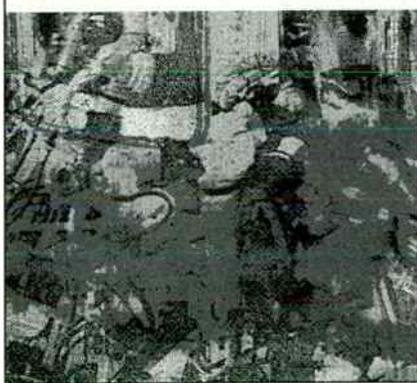
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16-17 'GYATSO



patently knows his way round his horn, and has plainly learned a lot from listening to noise-makers like Brotzmann: indeed, previously 16-17 have often sounded not unlike Last Exit, the groundbreaking free jazz/thrash metal group Brotzmann formed with guitarist Sonny Sharrock, drummer Shannon Jackson and bassist-producer Bill Laswell.

But the music on *Gyatso* is very different from sounds the group have turned in previously. The album has been produced by Patho front man Kevin Martin, who's credited with "samples", although that goes nowhere towards explaining the job he's done here. Taking the basic improvisations of Buess, Kneubuhler and Remond and fine improvisations they are - Martin has cut them up, pasted them back together, added indecipherable samples, had Buess add more destructive sax and the bassist from Midlands industrial-rock meisters Godflesh underpin the proceedings with relentless, psychotic basslines.

The results are stunning. *Gyatso* now features 13 (relatively) short pieces whose titles give up some of their intent *Flamethrower*, *Attack*, *Fall of the West*, *White Out* - a total assault on the strongest of sensibilities. The conventions of cut-up - or collage, or cut-and-paste, call it what you will are thirty years old in literature, and older still in the visual arts, but popular music has taken a wee while to latch on. But dance music, in many of its recent forms - techno, rap, trance, ambient - has taken collage to its heart, and the techniques of musical collage - sampling, loops, the crossfade - have become the true soundtrack of our times.

So ubiquitous is this kind of musical practice that its true subversiveness goes barely noticed. But hell, the very notion of *The Remix* - the industry standard for surely 90% of pop singles now - is the most revolutionary development in the last 20 years of pop music. Recorded music is no longer a finished artifact; it's simply so much data, and endlessly manipulable at that.

The historical significance of jazz - for pop music at least has always been its ability to show pop music what it's capable of. Now ignore that *Gyasto* is barely recognizable as jazz; one of jazz's most persistent features is that at any time its most highly developed form is

rejected as un-jazz. What *Gyatso* finely demonstrates is the occult revolution of the remix; it takes music already on the brink of breakdown and takes it further. Where an improvised drum passage hints at a groove, a tape-loop of it mutates into a jack-hammer rhythm; a thrown away scrap of sax solo becomes the basis of a three minute splatter-soundtrack.

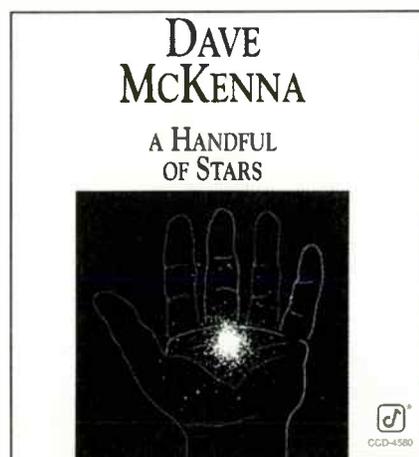
Sometimes it takes brutal art to reveal the hidden. On the brink of the Interactive Age, *Gyatso* is one of the most important jazz records of our time.

Simon Cooke

DAVE MCKENNA A Handful Of Stars

CONCORD JAZZ CCD-4580

● Despite the nocturnal connotations of many of the most famous jazz compositions, it is surprising that there are so few albums dedicated to stars that pianist McKenna's latest seems almost unique. The fact that there are fourteen tracks concerning varied stellar phenomena, bracketed by twin fifty-two-second cuts of Vitor Rami's 'Estrela, Estrela', on this album shows that there are more than enough astronomically inspired - and astronomically good - tracks to fill such an album, and McKenna has plundered the celestial vaults to bring us delicate meanderings such as Parish/Carmichael's 'Stardust', Washington/Young's 'Stella by starlight', and the immortal Harline/Washington 'When you wish upon a star', which will bring a thousand schmaltzy memories back to every Disney fan, young or old.



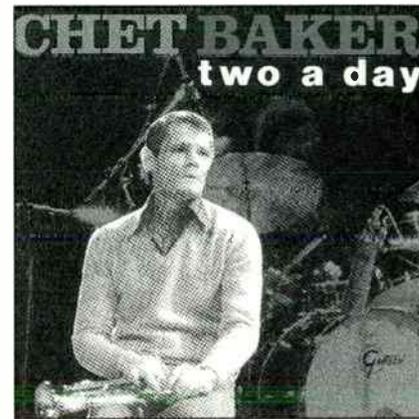
This is a solo piano album, which displays McKenna at his most delicate and touching, if not at his metronomic best. Here, he is the archetypal Manhattan cocktail-bar pianist, and he obviously feels at home in this role. Even though the style he espouses is the almost mindless 'jazz for the jet set', rather than the harder New England style which McKenna reserves for the cognoscenti, McKenna is such an experienced and talented pianist that this recording is neither boring nor overly sentimental. It keeps his talent firmly in the foreground.

Treat yourself; slip into that long-forgotten world of white tuxedos, stroll through Manhattan cocktail bars of the imagination with Myma Loy on your arm and order a couple of Dry Martinis. Just remember that Dave McKenna plays piano worthy of the very best lounges where a shaken Martini is still a Bradford, and don't let the side down, old chap.

CHET BAKER

Two A Day

191017-2



● Amsterdam, May 13th, 1988.

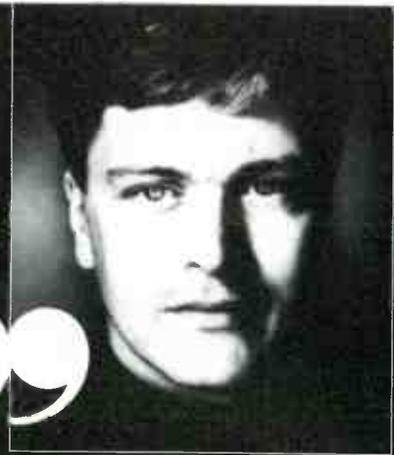
A great jazz voice fell silent forever as Chet Baker crossed that finest of lines between recording artist and hall-of-fame resident. Possibly more than any other, Baker's career was the definitive, descendant and graceful, arc of the jazz icon. Although his body dried and withered in the flame of his passage, the gentle, delicate tone of his trumpet, resembling in tone the angelic visage of the young Chet rather than the ageing, serene image portrayed on the album cover, never lost its sweetness or became sour the way it always seemed destined to. Baker held on to the promise of his early years right up to the end, and left a legacy of recordings made with easy grace and knowing vocabulary.

Many of the recordings we are left with are, musically, quite sparse, as is 'Two a Day'; there are only five tracks here, including the Baker-penned title track. The remainder consists of Irving Berlin's 'The best thing for you', Robin/Rainger's 'If I should lose you', (and two of my favourites) 'This is always' and 'Blue room' by Gordon/Warren and Hart/Rodgers respectively.

These five tracks were laid down right at the end of 1978, and are now re-released on the Dreyfus label, and a good thing too. 'Two a day' may not be a great work, or even one of Chet's best, but it deserves its place in the re-release lists that jazz heretics like myself - those who have turned their backs on the black stuff and only play CD - can enjoy the music without crawling in shame to a friend with a Rega or a Linn.

Chet may be gone, but he still has something to say to posterity, and he deserves to be heard. 'Two a day' is Chet worth listening to.

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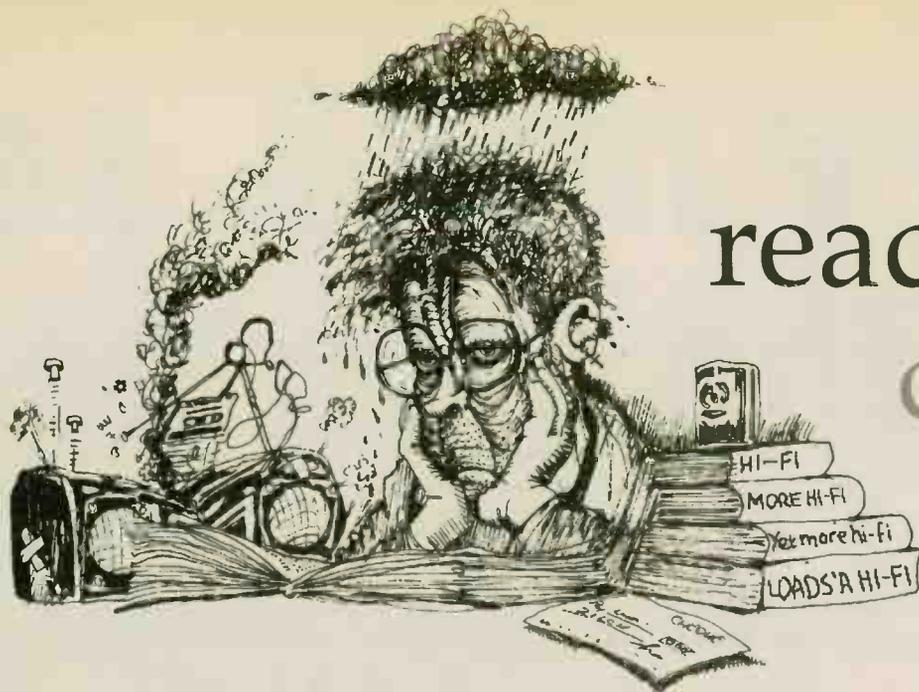
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readers' queries

INCONSISTENT TREBLE

My source components are: Marantz CD-52 MKII SE CD player and Marantz ST-40L tuner. My amplifiers are: Audiolab 8000C/P pre/power combination.

My speakers are: Epos ES-11's. Interconnects are: Furukawas FD-1010 from CD player to the pre-amp and Tandy patch wire between pre and power amp. Loudspeaker cable is: Cyrus Solid Core (bi-wired) I have a pair of Furukawa FS-2T14 speaker cables which I am not using.

My room measures 3 x 5 metres and speakers are 10cm away from the walls.

Although I'm generally happy with the sound with most CDs, treble is a little bit harsh, especially with the attacks on cymbals and other percussion instruments. Or with some CDs treble is so soft it is barely noticeable. But with some good recordings sound is very life-like, especially when the volume level is very high (about 12 o'clock position on the pre-amp).

How can I improve the treble sound from the 'speakers? I tried a Moth passive pre-amp and it gave better overall sound than the 8000C. I also suspect that 8000P is not strong on treble frequencies. I heard Meridian

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605 monoblocks with Audio Research LS-3 pre amp and the treble was very natural. I'm thinking about using Meridian monoblocks with a passive pre-amp such as Passion or Rotel Michi.

Do you think this is a good way of driving Epos ES-11s or are there other amplifiers I should consider?

Is there a cost-effective way of improving the sound, for example with better interconnects or speaker cables? I'm considering Kimber cable or Sonic Link range. Do you have any other suggestions?

**Omar Coskun
London.**

While you are right in saying that the

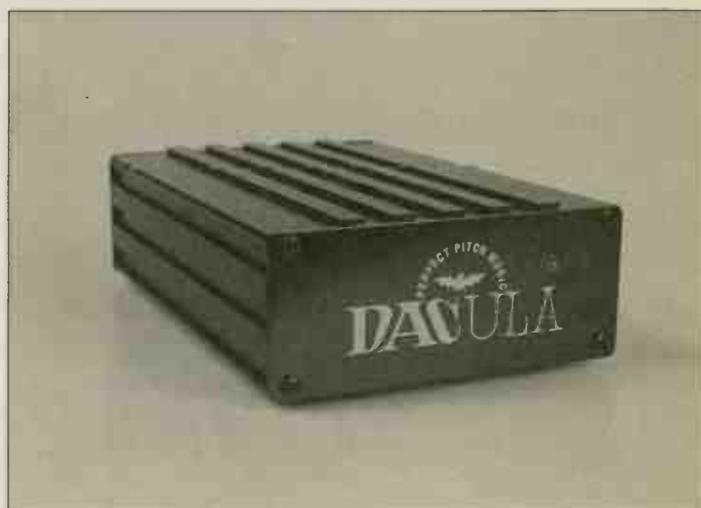
Audiolabs are not particularly strong on treble, they may not be the root of the problem, since the shrill, hard quality is probably coming from the CD player itself. A more cost-effective option would be for you to invest in an outboard DAC, for which I'd recommend the Select Systems Dacula at £395, this being a particularly smooth and lucid DAC.

The money you save in not changing the amplifiers could well go, like you say, towards upgrading your interconnects, and the Kimber or Sonic Link products you name are as good as any. You should also consider the Audioquest range, or ask your local

dealer if he custom builds his own. **SC**

Another DAC that is super smooth and easy in the treble is the Pink Triangle Ordinal. Like Simon, I'd look toward replacing the CD player as a priority in cleaning up the treble. **NK**

You may also like to try swapping over to the Furukawa 'speaker cable and moving the ES11s out into the room a little. A couple of feet in from the wall should be enough to give a cleaner, smoother and better focused midrange. If you only have one set of Furukawa 'speaker leads, use them on the treble. Fine stranded cables tend to



Dacula, a DAC with bite for only £395

Continued on page 101.... ▶▶

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... Continued from page 99

give a sweeter treble than solid core cables, and this may help make the treble a little more bearable. **DB**

FONS FITUP

I have recently acquired a Fons CQ30 turntable fitted with a SME 3009 arm. The serial number plate states the turntable was made in Scotland and although I know it is no longer made I can find no reference to it in any Hi-Fi magazines dating back six years.

Would anyone at your office remember this machine and the company that produced it? It has a 78 RPM speed setting so it must go back some way.

Having fitted a new drive belt to the motor, I transferred my Goldring 1012 cartridge from the trusty Dual 505 to the SME headshell.

The sound seemed much more open and detailed, bass drier, but clearer, especially with piano. Strings however can sound a bit edgy in the upper register, can you suggest any cure? Or am I now hearing them as they should sound? I have made all the settings on the arm and used a protractor for cartridge alignment.

Having been a music lover first and hi-fi buff second for several decades I would appreciate your comments.

Thank you for such a good magazine and for the many articles on older equipment.

**F. Eady
Romford,
Essex.**

I'm glad you're a music lover first; hi-fi should be about enjoying music, whatever form it takes, not about worshipping technology for its own sake. Some of the most technologically complex items made are least able to reproduce music properly, it seems to me. But happily the Fons CQ30 doesn't fit this description, even though it was a step up in complexity over its immediate

competitors at the time.

If my memory serves me well (it wasn't that long ago!) the Fons was unusual in possessing a d.c. servo motor instead of the common a.c. synchronous motor. It had a simple electronic power supply, with servo feedback from the motor for improved speed control. Speed changing was especially easy, 78rpm being included more to demonstrate this flexibility than anything else, since the 78 predated the CQ30 by at least twenty years.

Performance was superb; you have a first class turntable.

The SME3009 was designed for high compliance cartridges, especially Shures and ADCs. Today's Goldrings will put a lot of energy into the structure, the usual result being just what you describe: a certain coarseness in the upper midrange, plus light-ish bass. Also, the 1012 isn't too smooth, being a budget design. You'd be best off fitting a Rega RB300 arm to the CQ30, both for your current 1012 and for any other cartridge you may fit in the future. Tracking force should be set to 1.8-2gms.

NK

ON THE SHELF

Can you help me? The system consists of Rotel 940 amp, Marantz 52 MkII CD, NAD4225 tuner, Thorens TD 280 MKII, Cyrus 78 I speakers and van den Hul cabling and interconnects.

Music is mainly classical but does not exclude Billy Joel or Paco de Lucia. Essential for us in listening pleasure is clarity, balance, orchestral detail and fast response, but not at the expense of a firm bass line when Errol Garner is playing!

We are very content with what we have, but now the problem:

Our 24m2 sitting room is going to be furnished with a wall-covering bookcase, leaving no space for loudspeakers other than on the bookshelves. I don't want

to settle for anything inferior to the present sound, peacefully emanating through the 78 I's on their spiked stands. Budget is approx. £500 - for the change, the 78 I's will move to our study for continued enjoyment. Is there a solution? A woofer system? KEF 101/2 or Cyrus 751? Please do not confine me to my study nor suggest I stop reading.

**R Schram
London.**

You could also try the Rogers LS6A/2 at £499. Admittedly, they aren't at their best on bookshelves, but do give them a listen. The Harbeth HL-P3 is another of our favourites at £400, although it, too, may not take kindly to life on a bookshelf. There's little to touch them for clarity, balance, detail and speed at the price. Also, if you like the KEFs, their new Q60 'speaker comes in at only £399, and might be worthwhile. **SC**

Before you consider changing your loudspeakers I would

wait until the bookshelf is built. Most of Mission's loudspeakers are designed to be used up against a rear wall anyway, so the 78 I's should still sound fine. If the bass does become a little too overblown, a foam plug in the reflex port can be used to damp it down to a more suitable balance. If they really don't work, the only other two 'speakers that I can think of that work well on a bookshelf are the Acoustic Energy AE1s, which will give you the same excitement when you need it, but also the refinement required for classical, and the excellent little 760iSEs, again from Mission. These really shouldn't be underestimated, and they really suit being on bookshelves. **DB**

CLASSIC PROBLEM

Having recently purchased a pair of Mordaunt-Short Classic 40 loudspeakers, I am now considering upgrading my amplifier (Technics SU-570) and would appreciate your advice on my ideas.

Initially, I considered a



Harbeth's excellent HL-P3, should work well on a book shelf.

Continued on page 103....



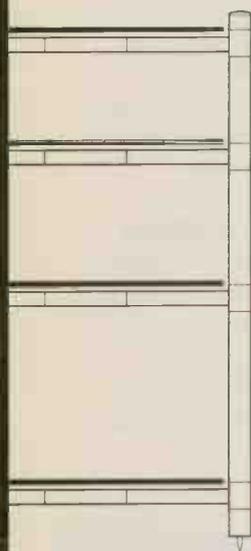
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.... Continued from page 101

choice of three amps, Audiolab 8000A, Arcam Delta 290, and Technics SU-A900, for the following reasons.

Audiolab and Arcam because they are highly recommended in various hi-fi publications, Technics because I think the combination of Mordaunt-Short/Technics works well and I could probably get a good discount on this amp from a local dealer.

My second idea was to save more cash and eventually go for Audiolab 8000C/8000P pre and power amp and possibly invest in an Arcam Alpha 5 CD player. I listen mostly to adult rock and blues music on CD.

**D Gordon
Morayshire.**

The Technics amplifier you mention probably would be a good match for the Mordaunt-Shorts, although both the Arcam and Audiolab 8000A are capable of rather more resolution and 'musicality'. The 8000A especially is an outstanding amplifier, and I don't think it's worth spending

more for the pre and power amps in your current set up.

Apart from the Audiolab, you should, perhaps, consider the Rega Elex amplifier at £359, which has a lot of speed. You might not like it, but have a listen.

Rather than going for the Arcam Alpha 5, consider a cheaper player with a coaxial output, such as the Marantz CD52 in one of its SE or Mark 2 guises. Add an outboard DAC to this, something like Select System's Dacula at £395 or

the DPA Little Bit II at £459, and you'll end up with an outstanding source for the price. **SC**

LOW LIFE

I'm in a quandary over my system which consists of: Cambridge CD3M - Kimber Optical - DAC3 Cambridge Audioquest Rubies connected between output and attenuator of DAC3 input to output to Cambridge A75 connected via Audioquest Turquoise and finally connection from A75 to Wharfedale Coleridges is made using Philips Fire Tuff double screened Halogen free 1.5mm single core cable which I find to be neutral-sounding.

The problem is when the volume is at normal level all the information - detail and tonality etc. is there but it

wife!

**F. S. Morrison
Paisley,
Scotland.**

Many people complain about this phenomenon. There are two causes: one is our level dependent hearing process, the other non-linear behaviour in hi-fi equipment.

At low levels, we lose sensitivity to low and high notes, which commonly makes music sound a little constricted and dull. As volume increases though, it apparently becomes "bigger and brighter" to us. Loudness controls are meant to combat this aspect of our hearing, by boosting bass and treble loss at low levels.

Loudspeakers with a little bass and treble boost will sound relatively balanced and

locate them firmly on good stands, so they don't tend to go backward as a reaction to forward cone motion. A position about 1-2ft in front of a rear wall should be about right. Wharfedale tweeters - in this speaker first an alloy dome then a ceramic dome - were not too sweet. You may be smothering the speaker to compensate for this problem, in the process compromising dynamics. An alternative loudspeaker with fine dynamics is the Mission 760iSE. Perhaps you should try auditioning them against your Coleridges. **NK**

BUDGET CASSETTE

I am writing to you in the hope that you may help me with cassette deck choice. I have two hundred pounds to spend on a cassette deck and would like a good quality/value for money deck.

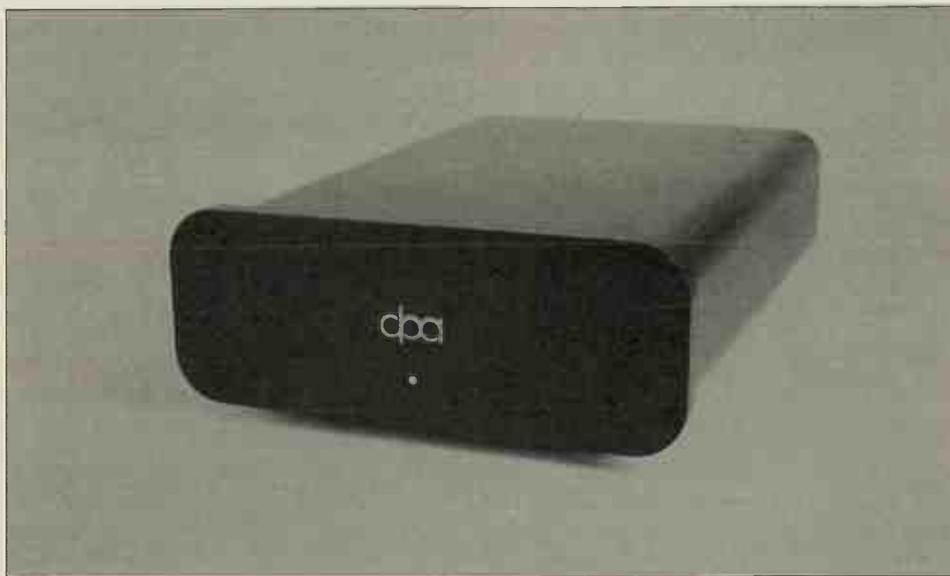
The single cassette deck would be used to put CDs onto cassette for use in a car. As I am a student I am looking for a make that will require a minimum of maintenance and will have a long life.

I have looked at the Rotel RD955AX, Technics RS-BX727, Yamaha KX-360 and Sony TCK41 IB separate decks. All of them sound reasonable and I thus can't choose between them.

If you are permitted to do so could you please recommend the deck which best fits my criteria? If you are unable to do this then could you simply indicate their recording quality and life-span?

The chosen deck will be used with a Technics £160

Continued on page 105... ▶▶



DPA Digital's Little Bit II - a superb CD source

appears muted as if there was a veil over the speakers. As soon as the volume is turned up 'and the police appear at the door', then the sound steps up a couple of gears in quality and resolution and it's not just because of the increase in volume. It genuinely feels as if that veil has been lifted.

Your valued help would be more than appreciated before my wife allows the police to take me away next time.

I can stretch my budget to £600 - £700 but don't tell the

natural at low levels because of this; those without it - and suffering mechanical stiction - will sound rather dead and lifeless.

Since the Cambridge CDM3, Cambridge DAC3 and A75 amplifier have plenty of life in our view, I believe you should cast a beady and critical eye over the Coleridge loudspeakers, even though modern Wharfedale's usually have plenty of life and bounce in them. Try to improve bass dynamics by using multi-strand cable and

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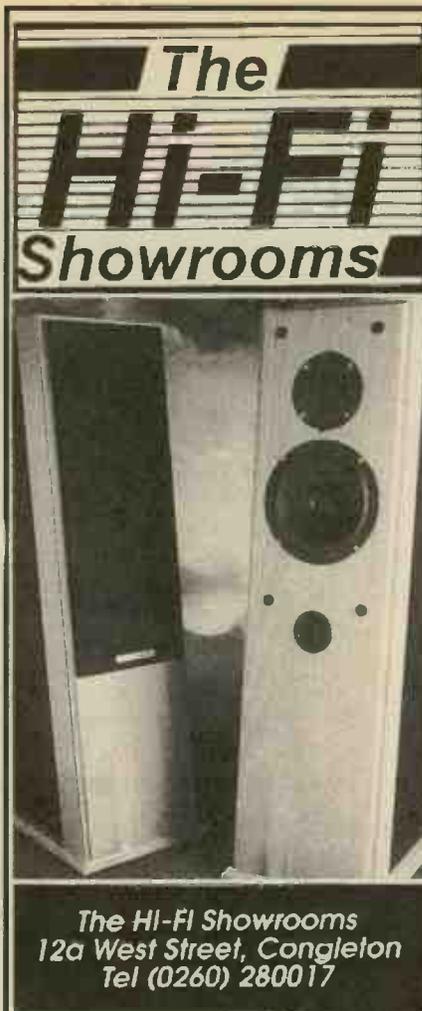
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... Continued from page 103

CD player and a Technics £140 amplifier.

John Sergi
Eastbourne,
East Sussex.

PS: If I ever intend to record from tape to tape I will need to buy an identical deck. Would it thus make more sense to simply purchase a £300 - £350 twin cassette

auditioning are the Denon DRS-610 and DRM-710 at £200 and £260 respectively. Try them in a head-to-head (if you'll pardon the pun) with the Yamaha and see which you prefer. **SC**

BI-AMPING MISSIONS

My system comprises a Mission DAD5 CD player, Rotel RB850/RC850 amp and Mission 762 speakers on Target stands. Leads are

mid/bass driver from the crossover and then wiring it direct to the amp? I assume that additional lengths of Cyrus Cable would be OK for bi-wiring and would it be worth re-wiring the speakers internally with the same?

My second source is a Monitor Audio ET500 record deck which I've had for about 7 years (£50 second hand!) can you give me any history on this deck? I've fitted this

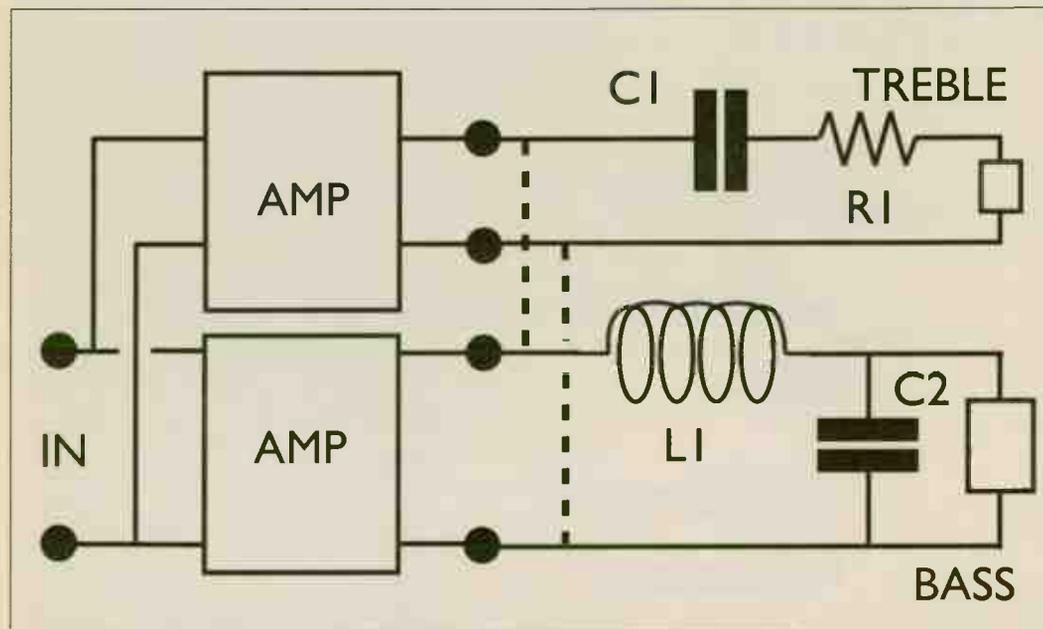
advice or, perhaps, a bale-out repair service should things go wrong. Do expect to pay for such help though, even assuming they are prepared to provide it (some shops aren't because sorting out DIY hash-ups is uneconomic). Ask about likely costs first, unless you are prepared to take the risk.

Bi-amping means, as I think you realise, splitting the crossover and running the treble sections from one power amp and the bass sections from the other. Some prefer to run left speaker from one and right speaker from the other, which better equalises the current draw on each amplifier. There should be no problem in running two power amps off one pre-amp, just by connecting the signal leads in parallel onto the output of the pre-amp.

I have drawn a typical crossover (not specifically the Mission's) to illustrate what must be done.

The treble section signal line and return line are split from the main input (dotted lines) and run to an additional input (solid lines). This means the top amp (channel) in the diagram feeds only high frequency energy to tweeter, seeing a very light load (tweeters require just a few watts at most). The other channel feeds the bass/midrange unit.

Using one amplifier for each loudspeaker, rather than a treble amp and bass amp, best equalises the power they handle. Light, solid core cable for the tweeter speaker cable and heavy, multi-strand for the bass are usually considered best. **NK**



The general principle behind Bi-Amping loudspeakers

deck in the beginning? I am wary of this as my dealer said double decks go out of synchronisation due to auto-reverse features and subsequently affect sound quality. Is this true?

Listen carefully and follow your dealer's advice. You'll get much better performance from two single decks than one twin, without fail, so stick with the first idea of a single deck, and buy another later if you really need it.

Yamaha have been producing some pretty respectable cassette decks for quite a while, and the KX-360, while not perfect, carries on that tradition, and is probably the best of the decks you name, although the Rotel also comes well-recommended.

Other tape decks worth

Audioquest and speaker cable is Cyrus Solid core. I also have a second RB850 power amp and I used to use these in bridged mode for more power/control over the speakers. I had to have a tweeter replaced, although I don't play music at particularly high volumes. My local dealer (Rayleigh Hi-Fi) thought that a "transient peak" might have "fried" the tweeter, so I now use only one of the amps in stereo mode.

I should like your advice on the possibility of bi-wiring the speakers. I am an electronics novice, but I can wield a soldering iron and I see no problem in drilling the cabinets for a second pair of binding posts (which I should be able to get from Tandy/Maplin).

Would this operation be as simple as disconnecting the

with a Rega RB250 arm and Linn K9 cartridge (I made the arm board from Medite) and it sits on Sorbothane feet in place of the original.

One more thing: although the Rotel pre-amp has only one set of outputs, would it be possible to split these (using suitable leads?) so that I could bi-amp the speakers (always assuming I can split the crossovers).

J.R. Thresher
Leigh-on-Sea,
Essex.

With two power amplifiers you could bi-amp the speakers; bi-wiring doesn't need a second amplifier. Bear in mind the fact that Mission don't encourage DIY with their products, so you'll be out on your own, unless Rayleigh are prepared to provide a bit of friendly

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HI-FI WORLD SOLID SILVER CABLE.....£139.95/1M PAIR.



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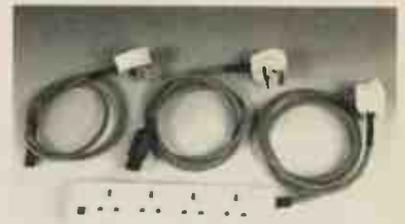
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RECORD STORAGE CUBE£42 EACH

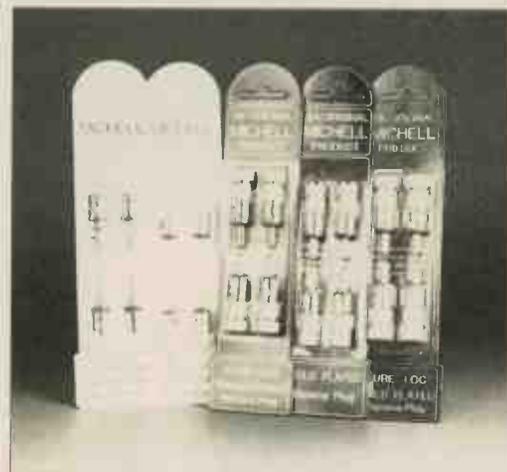
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Craftsmanship marks out Michell Engineering's rage of gold and rhodium plated plugs from the competition. Simple but elegant.

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This heavy-duty phono plug,

two to allow directionality to be taken into account. **RCA PHONO PLUGS (4).....£15.50**

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Hi-Fi World

AUDIO ACCESSORIES

AUDIO-TECHNICA RECORD CLEANING SYSTEM

Removes both dirt and static; a tiny amount of cleaning agent in the handle removes fingerprints, oil and film, while a pad lifts off dust. Pad brush and fluid are supplied.

AUDIO-TECHNICA RECORD CLEANING SYSTEM £10.50



AUDIO-TECHNICA COMPACT DISC LENS CLEANER

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

CD LENS CLEANER.....£16.25



BUG AUDIO

A fascinating little device no larger than a hand-held remote which allows the user to adjust bias on any cassette deck perfectly for any tape. You can check the state of your cables and connections with it, too! Supplied with a cassette test tape and full instructions. (See review, Nov. 1992 issue.)

BUG AUDIO£59.99



KONTAK

An effective cleaning solution that removes contaminants from electrical connections after application, a system regains its original life, sparkle and vigour.

KONTAK£19.00

HI-FI WORLD DRY STYLUS CLEANER

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

DRY STYLUS CLEANER ..£1.95

GOLDRING EXSTATIC MAT

For vinyl users, the Goldring Exstatic is a felt mat made with fine carbon fibre strands. This helps to reduce positively charged static electricity that builds up on the surface of records.

GOLDRING EXSTATIC MAT £7.50



SUPER EXSTATIC CARBON FIBRE DISC CLEANER

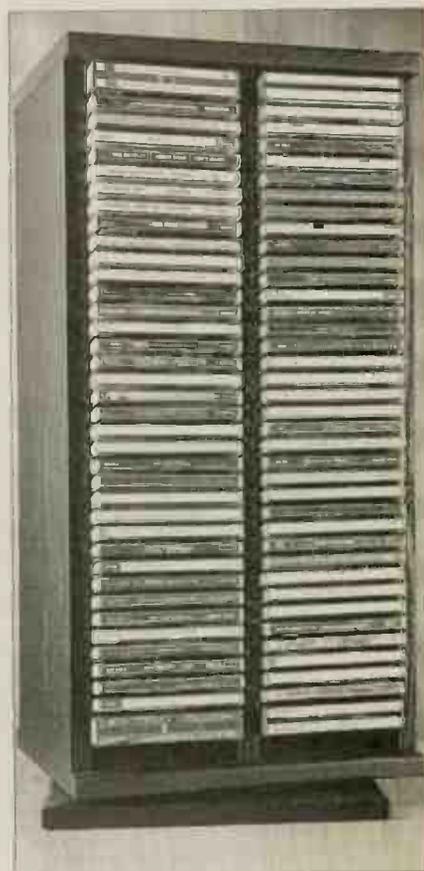
Effectively removes dust and grime from record grooves this cleaner is a combination of one million carbon fibre filaments and a soft velvet cleaning pad.

EXSTATIC CARBON FIBRE CLEANER £9.75

SOUND SWIVEL

A rotating, upright, double-sided, storage cabinet with space for up to 160 Compact Discs, including 8 double jewel-cases. Mounted on an all-steel turntable, it swivels smoothly through 360 degrees giving easy access to the storage compartments either side. Manufactured in durable MDF with a Black Ash effect finish, the Sound Swivel comes packed for self assembly with full instructions.

SOUND SWIVEL £49.95



AUDIO ACCESSORIES

EQUIPMENT SUPPORTS

FrameWorks is an innovative range of strong, rigid, and versatile hi-fi supports. They

for several months now and have yet to find anything that comes close. They are supremely rigid and hard wearing and will extract the



H100 ISOLATION TABLE

achieve a high standard of strength and rigidity from their 'triangulate' design. The shelves are supported on struts of thin cross-section, which in turn are rested on struts of thicker section, and through these connected to four sturdy corner columns.

This variety of cross-sectional frame members effectively reduces resonances through their spread and dissipation. The supporting columns may also be filled, to further optimise these supports for your equipment.

Versatility is guaranteed by the variety of two and three shelf supports available as well as the stacking unit for additional shelves and the isolation shelf, which can be used as a stand-alone unit on a shelf or floor, if preferred.

So these shelves will stack and expand as your system grows. All you need do is add components as and when you feel the need.

FrameWorks stands come with attractive toughened smoked glass, which is fully 10mm thick. This is supported on spikes which have rubber dampers around them to reduce vibration and lessen the tendency for the glass to slide. Metal parts are finished in a hardwearing satin black powder coat.

We at Hi-Fi World have been using Frameworks stands

best out of any equipment Frameworks' excellent hi-fi equipment stands are now available through our Mail Order Department. Please phone for further details: 071 266 0464



H700 3 SHELF EQUIPMENT RACK

Stacker **H175**

Isolation **H100**

H500

H700

H900 Self assembly

PRICES FOR FRAMEWORKS EQUIPMENT STANDS ARE AS FOLLOWS;

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H175	175MM	£119
H500	500MM	£205
H700	700MM	£275
H900	900MM	£305

ALL FRAMEWORKS SHELVES ARE 550MM WIDE BY 450MM DEEP.

All prices include VAT & p+p for UK only.

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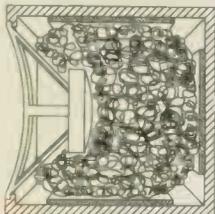
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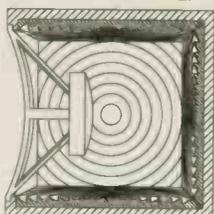
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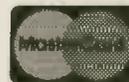
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Since nothing really exists which gives a reasonable background to the subject of valve amplifier circuit design, Guy Adams and I have written and assembled a number of articles and extracts from old books which give some background to the subject, do not expect to become an instant expert, but it will serve as a useful reference, for the beginner as well as the more advanced, we have expanded this info-pack to include even more useful information so if you have already bought the old pack, just send £2.00 or US\$ 5.00. For the full pack a small charge is required, this time £7.00 in small denomination stamps with a stamped addressed envelope, or outside the UK, please send US\$ 25.00.

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All our single-ended output transformers are airgapped, and the maximum standing current allowed before saturation is shown in column 5.

All our output transformers have a frequency response well beyond the audible range, typically 20Hz - 40KHz minus 1.5dB, all are IE-cored with high grade silicon steel laminations, wound with oxygen-free copper wire and supplied with either bell-ends or frames, both with flying leads.

We generally overspecify our transformers by 50% power in Push-Pull (which means that a transformer stated as 25 watts will allow about 35-38 watt peaks, our single-ended outputs are generally over specified by 100%, which means that they will instantaneously allow peaks of double the given maximum power through undistorted.

We do not give any further technical information on our output transformers, as we do not wish to take part in technical competitions, our products are designed to criteria which are and will be understood once they are listened to!

In addition to the output transformers offered below, we offer a design service, where we can supply almost any requirement for wideband transformers, whether for microphones, moving coil cartridges, line input, phase splitter, interstages, driver or power output, we design and manufacture prototypes in-house, the cost for the paper design is £200.00, prototype cost is calculated on a per case basis. We can also produce production quantities.

Sizes are given as Width/Height/Depth, where depth is the depth of the coil itself and width is the length of the core.

PAPER IN OIL SIGNAL CAPACITORS

These handmade signal capacitors are sonically superior to any of the plastic or other paper types we have come across. If you have never experienced the difference that a really good paper/oil capacitor can make in a valve amplifier, then you really should try. Our specially made paper/oil caps have a life, colour, lack of harshness and evenness of dynamic behaviour across the frequency range, which is guaranteed to brighten up your day! Recommended as replacements in old and new valve amplifiers alike (and even in the odd transistor amplifier), and essential for DIY projects. In line with environmental standards, all AUDIO NOTE paper in oil capacitors contain only non-toxic, biodegradable vegetable oil, the paper is specially treated and

impregnated by a method that enhances longevity and sound quality, to ensure optimum performance all round.

Value	DC Voltage	Size	Price ex. UK Vat
0.015mF	400volt	21x9mm	2.85
0.022mF	400volt	35x10mm	3.75
0.047mF	400volt	32x11mm	4.10
0.082mF	400 volt	33x14mm	4.25
0.12mF	400 volt	33x14 mm	4.75
0.18mF	400volt	32x16 mm	5.15
0.22mF	400 volt	35x18 mm	5.85
0.33mF	400 volt	43x18 mm	6.75
1.4mF	400 volt	70x24 mm	14.95
0.0015mF	630 volt	17x9 mm	2.85
0.022mF	630 volt	20x10 mm	3.25
0.082mF	630 volt	33x16 mm	4.55
0.18mF	630 volt	43x18 mm	5.45
0.22mF	630 volt	52x19 mm	5.75
0.33mF	630 volt	52x22 mm	7.25
0.39mF	630 volt	52x26 mm	7.95
0.47mF	630volt	52x26mm	8.85
0.22mF	1000 volt	56x26 mm	6.95
0.39mF	1000 volt	61x26 mm	11.65
1.2mF	1000 volt	72x40 mm	16.75
0.22mF	1600 volt	60x26 mm	9.65
0.22mF	2000 volt	70x29 mm	11.55

All Audio Note paper in oil signal capacitors are axial type. We are preparing a range of very small picofarad value paper in oil capacitors at the moment in addition to the above. The range of AUDIO NOTE paper in oil capacitors is steadily expanding, so ask for values that you do not see.

PAPER IN OIL COPPER FOIL SIGNAL CAPACITORS.

We are currently developing a range of paper in oil capacitors where instead of using aluminium foil as in the above paper caps, we use an oxygen free copper foil with 99.99% pure solid silver lead out wires, these copper foil paper signal capacitors are considerably better than standard offerings. Secondly to "bridge" the price-quality gap between the more standard paper/oil caps and the Japanese handmade silver foil signal caps, we will be offering our own 99.99% pure silver foil signal caps, which are pretty staggering in quality, even if I have to say this myself (as I am the only one to have heard the samples so far) the silver foil caps will also have solid silver lead-out wires. To start with there will be a few values/voltages available.

AUDIO NOTE SILVER FOIL SIGNAL CAPACITORS.

Best signal capacitors available, quality really speaks for itself, used in amplifiers like OMGAKU, KEGON, GAKU-ON and M7TUBE Silver, handmade in very limited quantities at Audio Notes facility in Tokyo, Japan.

Value	DC Voltage	Price ex. UK Vat.
0.02mF	500 volt	211.75
0.05mF	500 volt	346.75
0.1mF	500 volt	645.75
0.2mF	500 volt	995.75

AUDIO NOTE PAPER IN OIL RESERVOIR CAPACITORS.

Mainly for use in inductor power supplies, but have other uses.

Value	DC Voltage	Size	Price Ex. UK Vat.
2mF	400 volt	30x40x55 mm	26.75
2mF	630 volt	35x45x72 mm	33.65
2mF	1000 volt	45x45x72 mm	41.75
2mF	1600 volt	50x70x72 mm	45.95
4mF	1000 volt	45x45x120 mm	49.95
4mF	2500 volt	70x70x120 mm	265.75
10mF	1000 volt	70x100x100 mm	96.75
12mF	1000 volt	70x100x120 mm	109.95
12mF	1600 volt	100x100x120 mm	136.75
12mF	2000 volt	100x100x220 mm	159.75

AUDIO NOTE ACID & CHLORIDE FREE SILVER SOLDER.

The best solder we have been able to find, does

not contaminate the junction, which over time increases junction resistance. Used in all our amplifiers from OTQ to the GAKU-ON.

Weight/Measure	Price Ex. UK Vat.
50, grammes or about 8 meter 1 mm diameter	19.95
1 kilo roll of 1 mm diameter	210.65

AUDIO NOTE CABLES & WIRES.

We are proud to offer the AUDIO NOTE range of high quality copper and silver coax, speaker and wiring cables, which, depending on the overall price of the project will do justice to any hi-fi system, regardless of price.

Solid 99.99% Pure Audio Note Silver Wire.

Gauge Insulation Material Price per Meter Ex. UK Vat.

Gauge	Insulation Material	Price per Meter Ex. UK Vat.
0.05mm	Polyurethane	16.75
0.2mm	Polyurethane	22.75
1 mm	ML	36.75
0.35mm	ML	24.95
0.6mm	ML	27.85
0.8mm	ML	31.75

The above solid silver wires are suitable for inductors for speaker crossovers, both active and passive or for internal wiring in tonearms, amplifiers etc.

AUDIO NOTE HIGH QUALITY STEPPED ATTENUATORS & SWITCHES.

These handmade attenuators and switches are manufactured by a friend of Mr. Kondo of AUDIO NOTE, and represent the best available volume controls and switches you can use in your pre-amplifier, the attenuator is 48 steps and with silver/rhodium plated contacts/brushes made with an array of tantalum film resistors. The switches feature silver plated contacts and self cleaning action.

Type	Value	Price Ex. UK Vat.
Stereo Potentiometer /Attenuator	50KOhms	198.75
Stereo Potentiometer /Attenuator	100KOhms	207.75
2 Channel switch	6 - way adjustable	78.75
4 Channel switch	6 - way adjustable	101.75

AUDIO NOTE HIGH QUALITY CERAMIC VALVE BASES

All of our valve bases are of the highest possible quality, made from steatite and using the best metal parts from alloys which retain their spring tension around the valve pin for longer. They are recommended as upgrades to most old valve amplifiers and should be an essential part of any DIY project.

Type	Mounting	Plating	Price Ex. UK Vat
4-pin UX4 for 300B /2A3/801A Chassis		Gold	8.25
4-pin UX4 for 300B /2A3/801A		Chassis	Nickel
4-pin UX4 WE-type for 300B/2A3/801A Chassis		Silver	14.75
4-pin Jumbo 4 for 211/VT4C/845 Chassis		Silver/chrome	159.95
5-pin UY5 for 807 Chassis		Gold	9.75
7-pin B7 for 6X4, OA2		PCB	6.15
7-pin B7 for 6X4, OA2		PCB	7.85
7-pin B7 for 6X4, OA2		Chassis	6.75
7-pin B7 for 6X4, OA2		Chassis	7.95
8-pin UX8 for EL34, 6550, 5U4G, GZ34, 6L6G, etc.		Chassis	5.65
8-pin UX8 for EL34, 6550, 5U4G, GZ34, 6L6G, etc.		Chassis	8.65

9-pin B9 for ECC83, ECC88, 5687, 6350, etc.	PCB	Silver	3.85
9-pin B9 for ECC83, ECC88, 5687, 6350, etc.	PCB	Gold	5.75
9-pin B9A for ECC83, ECC88, 5687, 6350, etc.	Chassis	Silver	4.45
9-pin B9A for ECC83, ECC88, 5687, 6350, etc.	Chassis	Gold	6.75
9-pin B9A for ECC83, ECC88, 5687, 6350, etc.	Chassis	Silver	4.95
9-pin B9A for ECC83, ECC88, 5687, 6350, etc.	Chassis	Gold	7.15
Topcap For 807 pentode		Nickel	9.75

You may want to start your project with less overall cost, and for this purpose we can offer the following industrial grade ceramic valve bases.

Type	Mounting	Price Ex. UK Vat.
8-pin for EL34, 6550, KT66, 6L6G Chassis with bracket		1.45
9-pin for ECC83, ECC88, 5687, 6350	Chassis with shroud	1.85

AUDIO NOTE SELECTED AUDIO VALVES.

Our valves are selected from the best available sources and are tested to the same stringent standards that we apply in the production of our own amplifiers, they fall into two categories, standard production items and rare, mostly NOS (New Old Stock) valves which are no longer in production. We have compiled a special list of the NOS items, which is available on request, beware the valves on this list are NOT cheap.

Standard Stock Items,

Type No.	Type	Price Ex. UK Vat
ECC835/12AX7WA/7025	double triode	2.95
E88CC/6922/6DJ8WA/7308	double triode	3.95
EF86/6267/7279	pentode	2.45
ECC82/12AU7/6189W	double triode, mil spec	5.75
65N7	double triode, UX8 base	1.75
65L7GT	double triode, UX8 base	2.85
65J7	double triode, very powerful	4.55
5687WA	double triode, small power	4.75
6350WA	double triode	1.55
EL84/6B05	pentode, small power	4.75
EL84M/6B05WA	pentode, mil spec version	4.75
6V6GT	small power pentode	2.45
6L6G	medium power pentode	2.75
5881/KT66/6L6WGC	medium power tetrode	4.95
EL34G	power pentode	7.45
6550/KT88	large power tetrode	12.45
6C33	powerful regulator, indirectly heated	24.65
6A57/6080	strong regulator, indirectly heated	6.45
2A3 4pin	directly heated small power triode	17.95
300B	directly heated power triode	57.95
5U4G	HT-rectifier	3.25
5Y3GT	HT-rectifier	2.25
5V4GT	HT-rectifier	2.25
GZ34/5AR4	HT-rectifier	8.75
6X4	HT-rectifier, very good for pre-amplifiers	2.65

RESISTORS

Beyschlag

We offer three quality levels of resistor quality, all are 1%, starting with the Beyschlag metalfilm, which are slightly magnetic (as are the vast majority of other makes of metal film resistors), but nonetheless very good sounding, as used in all our UK-made amplifiers, up to quality level 3 (the MEISHU/P3) no-feedback triode amplifiers.

Beyschlag 1 watt, 1% resistors up to 500KOhm, E 0.11, above 500KOhm £0.13 each.

HOLCO

Better sound quality can be achieved with the H2, 1 watt, 1% non-magnetic resistors, which we regard as the best "industrial grade" metalfilm resistors available. They have one small drawback, as they are quite fragile, and require careful handling, do not bend the legs too close to the body, they may become noisy.

HOLCO resistors type H2 50PPM cost £0.36 each from 1000Ohm to 500KOhm, higher and lower values are all £0.63 each.

SHIMKOH Tantulum Film Resistors.

This is definitely the best sounding resistors available, forget the VISHAY, which may be ok in high feedback transistor amplifiers, but in our opinion quite uncomplimentary to the qualities of real Audio Amplification (i.e. directly heated triode amplifiers running feedback free in single-ended Class A), this is where you will need the tantulum film resistor for the best results.

Up to now the tantulum film resistors have been extremely difficult to get, however, after much persuasion and against a minimum quantity guarantee from AUDIO NOTE UK, the manufacturers have agreed to widen the range of 1/2 watt and reintroduce the 1 watt range, I consider this to be a major breakthrough, since without a reasonable range of values at the 1 watt rating it is pretty difficult to get the very best out of our best circuits. As with most handmade specialist items

Anyway, the 1/2 watt, 1% tantulum resistors are non-magnetic and cost £2.06 each for all available values. There is long delivery on all values, so be prepared to wait if a value is not stock.

BLACK GATE ELECTRON TRANSFER, High Performance, Graphite Electrolytic capacitors.

There are very few audio parts that promise a guaranteed improvement when replacing practically any other part, but this is what the BLACK GATE capacitors actually do. Exchanging any electrolytic capacitor anywhere in the circuit of an amplifier or in the crossover of a speaker will greatly improve sound quality. We are working on some guidelines as to where, how and which types of Black Gates to use in different circuits, the first such technical guideline is available now and is called "Improving your CO-Player" and can be obtained by sending a stamped addressed envelope to us requesting this leaflet. It is very important to note that all BLACK GATE capacitors take time to charge-up or stabilize, when first put in circuit, depending on type and application this "maturing" time can be between 100 and 300 hours.

Value	Voltage	BG-Type	Suggested Use	Price Ex. UK Vat	
0.47mF	50volt	PK	Anywhere	1.05	
1 mF	50volt	PK	Anywhere	1.25	
2.2mF	50volt	PK	Anywhere	1.55	
4.7mF	50volt	PK	Anywhere	2.15	
22mF	50volt	PK	Anywhere	3.35	
100mF	100volt	Standard	Anywhere	7.75	
1 000mF	50volt	Standard	Anywhere	24.55	
220mF	1 6vott	Standard	Anywhere	4.35	
470mF	1 6vott	Standard	Anywhere	6.35	
2200mF	50vott	standard	Anywhere	13.45	
10,000mF	80vott	Standard	PSU smoothing	234.65	
4700mF	1 6vott	Standard	Anywhere	14.25	
47mF + 47mF	500vott - 550v surge	SK-Type	PSU filter capacitor	85.95	
100mF + 100mF	500vott - 550v surge	SK-Type	PSU filter capacitor	101.95	
100mF	500vott - 550v surge	SK-Type	PSU filter capacitor	72.75	
220mF + 220mF	350vott - 400v surge	SK-Type	PSU filter capacitor	92.65	
100mF + 100mF	100mF	350vott - 400v surge	SK-Type	PSU filter capacitor	75.35
22mF	350vott	VK-Type	Decoupling or filter capacitor	18.95	
220mF	1 6vott	F-Type	Low ESR version	6.75	
220mF	1 6vott	FK-Type	Ultra low ESR version, comparable to film caps	9.95	
1000mF	50vott	FK-Type	As above use anywhere	43.95	
2200mF	50vott	FK-Type	As above use anywhere	98.85	
4.7mF	50vott	C-Type	For circuits with DC potential difference	3.35	
1 mF	50vott	N-Series	Bipolar for use in negative feedback circuits etc.	4.95	
4.7mF	50vott	N-Series	as above	5.75	
10mF	50vott	N-Series	as above	6.95	
47mF	50vott	N-Series	as above	13.75	
100mF	50vott	N-Series	as above	18.95	
6.8mF	50vott	Bipolar	For loudspeaker crossover networks	8.95	
1 0mF	50vott	Bipolar	as above	10.85	
22mF	50vott	Bipolar	as above	17.45	
47mF	50 vott	Bipolar	as above	27.95	
100mF	16vott	BG-N Type	For super low noise PSU's	24.65	
470mF	16vott	BG-N Type	as above	28.95	
1000mF	50vott	BG-N Type	as above	99.95	
220mF	100vott	BG-N Type	as above	423.35	

On the next page is a list of all BLACK GATE capacitors available. Together their sizes best usage etc. Lastly, we can supply a range of more modestly priced components, still good quality, but more industrial grade, if you like.

AUDIO10 QUALITY OUTPUT TRANSFORMERS.

Single-ended Circuits.

Suggested Valve VAT	Max Cl. A Power	Prim-Sec. Impedance	Size/Weight Max.	Current	Price ex. UK
EL84/ECL86/6V6	20 watts	2K6 - 4/8 Ohms	117x98x90 mm	110mA PSF	87.00
300B/2A3/6B4G	25 watts	2K5 - 4/8 Ohms	117x98x90mm	90mA SE	91.00
EL34/6550/KT88	30 watts	1K5 - 4/8 Ohms	115x98x95mm	180mA PSE	113.00
2A3/6B4G	30 watts	1K25 - 4/8 Ohms	98x82x95mm	130mA PSE	97.00
5881/KT66	30 watts	2K1 - 4/8 Ohms	115x98x95mm	140mA PSE	106.00
211/VT4C	30watts	10K - 4/80hms	117x98x100mm	150mA SE	114.00
211/VT4C/845	50 watts	10K - 4/8 Ohms	112x134x150mm	150mA SE	124.00
300B	50 watts	1K25 - 4/8 Ohms	135x115x125mm	180mA PSE	151.00
845	50watts	2K5 -4/8 Ohms	137x114x130mm	180mA PSE	172.00
211/VT4C	75 watts	5K-4/8 Ohms	137x115x145 mm	240mA PSE	237.00

New SE Product

EL34/6550/KT88	20 watts	3K - 4/8 Ohms	117x98x92 mm	130mA SE	104.00
6L6G	30 watts	3K - 4/8 Ohms	115x98x95 mm	140mA PSE	107.00

Push-Pull Circuits

EL84/ECL86/6V6	15 watts	8K - 4/8 Ohms	80x67x68 mm	PP	42.00
EL34/6L6G/5881	25 watts	6K - 4/8 Ohms	88x73x80 mm	PP	59.00
2A3/6B4G/300B	30 watts	5K - 4/8 Ohms	88x75x80 mm	PP	63.00
KT88/6550	50 watts	6K6 - 4/8 Ohms	108x91x90 mm	PP	73.00
EL34/KT66/5881	50 watts	3K - 4/8 Ohms	98x82x83 mm	PPP	74.00
845	50 watts	6K8 - 4/8 Ohms	108x91x90 mm	PP	114.00

Pure Silver Wired Outputs.

300B/2A3/ 6B4G	25 watts	2K5 - 4/8 Ohms	11 7x98x90 mm	90mA	SE	1,645.00
211/VT4-C/845	50watts	10K - 4/80hms	112x134x150mm	150mA	SE	1,975.00

The AUDIO10 NOTE silver wired outputs listed here are designed and made in the UK, we can supply the AUDIO10 NOTE Japan manufactured outputs for the ONGAKU or the KEGON, but they are exceptionally expensive, as you would expect from items that take upwards from 100 hours each to make, for example an output transformer for an ONGAKU costs £16,500.00.

AUDIO NOTE CHOKES & INDUCTORS.

Value	Size	Price Ex. UK Vat
3H/1 00mA		14.00
5H/1 50mA		21.00
10H/125mA	63x74x76 mm	26.00
10H/200mA	98x65x63 mm	33.00
0.5H/400mA		18.00
3H/2250mA for ONGKUCu		24.00
5H/400mA		31.00
20H/50mA	68x56x58mm	24.00

Other values can be supplied by order, ask for quote.

AUDIO10 NOTE Coax Interconnect Cables.

Type/Colour code	Construction	Price per Stereo Meter Ex. UK Vat.
AN-A yellow	symmetrical 6N copper litz coax	15.32
AN-C red	symmetrical OFHC copper litz coax	29.79
AN-S dark grey with yellow stripe	symmetrical 99.99% silver litz coax	84.25
AN-V silver grey with yellow stripe	symmetrical 99.99% silver litz coax	152.35
AN-Vx silver grey	symmetrical 99.99% silver litz coax	382.98

It is recommended to use the internal twin silver wires in the AUDIO10 NOTE coax cables as internal wiring cable, this is what we do in amplifiers like the ONGAKU, M7Tube etc.

AUDIO NOTE COMPLETE KITS.

We are developing a range of complete kits, to give those of you who have the ability, but do not have the time to develop a project from the ground, so to speak. In order to be able to offer the best possible quality - price relationship the kits we offer will be good basic circuits, with no-trills power supplies and components.

Kit One.

Based around the justly famous 300B directly heated triode, we see this kit as the introduction to real Audio Amplification, as it covers all the important aspects of design necessary, Single-Ended, No-Feedback, Class A, Directly Heated Triode, to become a member of this exclusive club of amplifiers.

Kit One has one 300B per channel running at 420 volts with 75mA current giving 9/10 watts of the cleanest power you will ever hear, the input stage consists of a 65N7GT with a 5687 double triode driver stage running in SRPP

The powersupply is a capacitor-choke-capacitor with a 5U4G HT rectifier, the heaters are AC heated

Component quality is similar to our Level 2 finished products, AUDIO10 NOTE paper in oil signal capacitors, Beyschlag 1watt 1% metalfilm resistors, good quality electrolytics (sorry NO Black Gates!) and a simple, attractive stereo chassis in grey paintwork. Protecting cover is extra.

Price £750.00 incl. Vat, which includes all valves (yes, also the 2 x 300B needed) but not postage/packing which to UK customers is £12.00, topcover is £99.00 extra. The Kit One is available now

Kit Two.

Kit Two features a single 6550WA Sovtek tetrode running in Single-Ended mode, yielding some 17 watts of pure Class A, valve rectified HT for its output stage, audio chassis, and 6SL7GT input and 6SH 7GT SRPP driver stage, component and chassis as Kit One. Price £600.00 incl. Vat, includes valves, but not postage/packing, cover is extra at £99.00 Available in March 94

Write to AUDIO10 NOTE (UK) Ltd, Unit 1, Block C, Hove Business Centre, Fonthill Road, Hove, East Sussex, BN3 6HA, England. Telephone +44 0273 220511, fax +44 0273 731498, Direct Line to sales +44 0273 8 8 5 1 1 .

MAINS TRANSFORMERS

This range relates to our finished products, mains transformers are notoriously difficult items to offer as the number of permutations of HT and Heater voltages are almost endless. We shall be offering a more comprehensive range as opportunities arise

Primary Voltages	Secondary HT Windings	Secondary Heater Windings	Price Ex. UK Vat
0v/100v/110v/120v	0v-230v at 350mA	0v-12.6v at 1 Amp	34.00
0v/220v/230v/240v	3 1.5v-0v-3.1 5v at 4 Amp		
120v/1 10v/100v/0v	0v - 230v at 0.4 Amp	0v-12.6v at 1 A	41.00
0v/1 00v/11 0v/1 20v	3.1 5v - 3.1 5v at 4 Amp		
0v/1 00v/11 0v/1 20v	0v - 290v at 40mA	12.6v-0v at 1 5A	26.00
0v/100v/110v/120v	0v - 6.3v at 300mA		
0v/100v/1 10v/120v	310v-244v-0v-244v-310v at 320mA	3.15v -0v-3.15v at 4.5 Amp	72.50
0v/100v/110v/120v	0v-920v at 160mA	12.6v at 1.5 Amp	
0v/100v/110v/120v	150v-150v at 50 mA 1 5A,	0 -10v at 4 Amp, 0v-6 3v at	98.00
120v/1 10v/1 10v/0v	390v-0v-390v at 200 mA	0v -5v at 2.5A	
0v/1 00v/11 0v/1		3.15v-0v-3.15v at 1.2Amp, 7v	86.70
0v/1	20v/1 70v at 50mAat 3A,	7v at 3A, 5v at 2A	
120v/110v/100v/0v	425v-0v-45v at 220mA	3.15v-0v-3.15v at 2.5A	95.60
100v/110v/120v		7 0v-0v, 7 0v-0v, 5 0v-0v	
		3 15v-0v-3 15v at 750mA	*for KIT ONE or "KASSAI" replica

AUDIO10 NOTE Speaker & Wiring Cables.

Type/Colour code	Construction	Price per Mono Meter Ex. UK Vat.
AN-D green	single core 6N copper speaker wiring	6.85
AN-B blue white writing	double strand s creened 6N speaker wire	12.34
AN-L blue black writing	wire double strand, screened 6N litz copper	25.11
AN-SP silver	speaker wire single core 15 strand 99.99% litz	106.38
AN-SPx silver	silver speaker wire single core 20 strand 99.99% litz	382.98
PTFE Insulated Silver Plated Copper Wires.		

We can also provide less expensive wiring wires for hard wiring circuits, these PTFE insulated silver plated copper wires are 19 strand of 0.15 mm wire and come in brown, black, blue, pink, red, green, orange, violet, white and red/white, they cost £1.60 per meter in any colour

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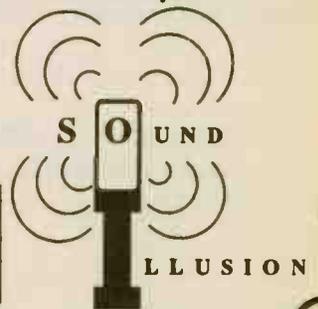
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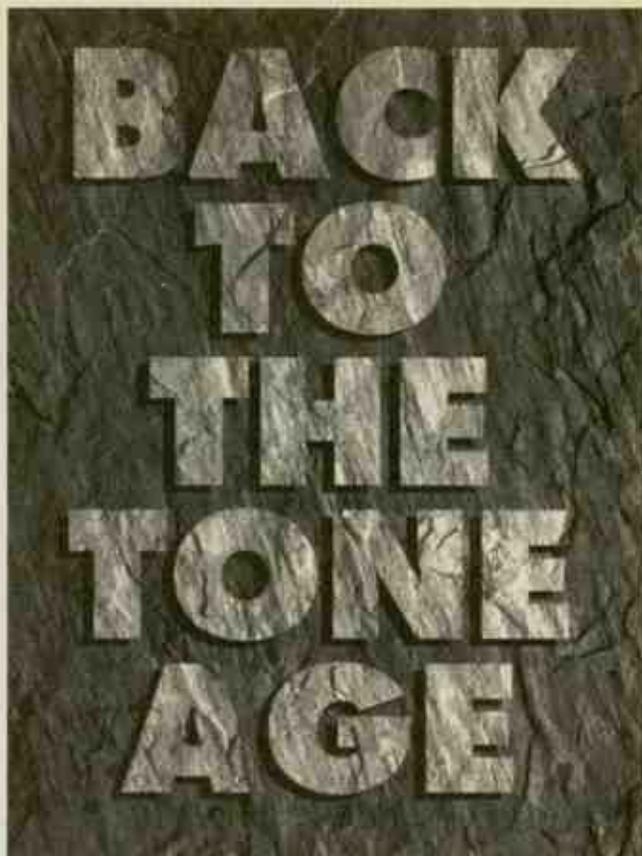
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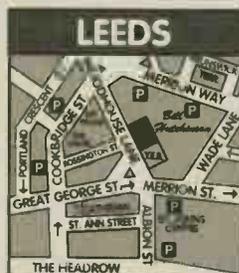


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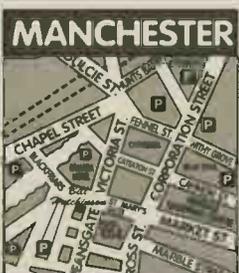
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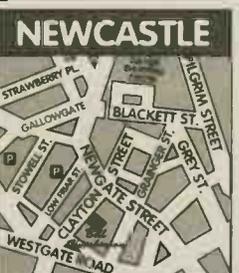
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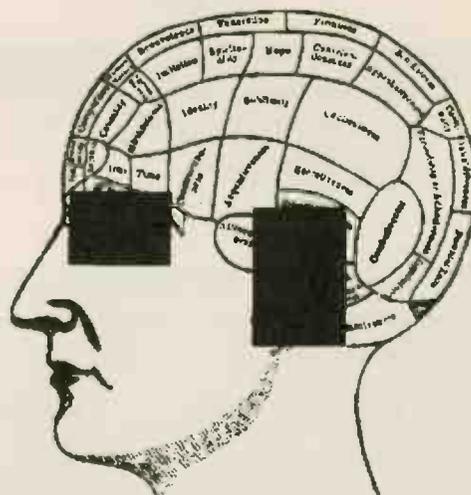
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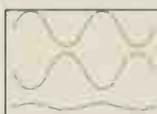
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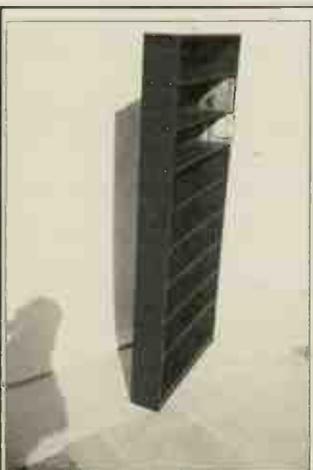
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SME MODEL 20	£2495	The last great turntable, bettered only by the £11,000 Model 30.	Oct'92

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PIONEER A-300X	£200	Exceptionally sweet mid and treble, plus the superb dynamic range of the A400.	Dec'92
DENON PMA-350II	£220	Powerful and with deep rhythmic bass drive.	Sep'93
H/K HK6550	£349	Thoroughly refreshing, tonally neutral amplifier with a realistic price tag	Nov'92
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AUDIONOTE OTO	£1250	12w Valve amplifier. More in tune with music than hi-fi. Superb dynamic range.	Jun'92
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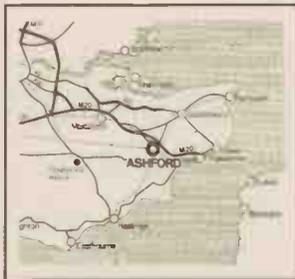
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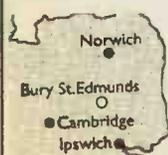
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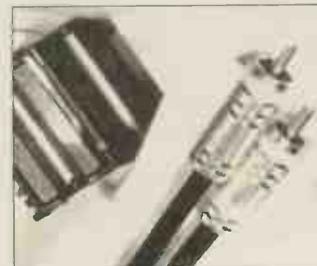
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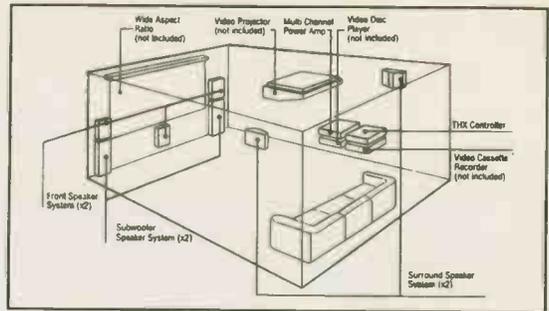
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LINN SYSTEM; Karik/Numerik, Kairn, Kremlin, Klout; Sonus Faber and Foundations; all mint, 6 months old with receipts. Extended 5 year Linn warranty. Full demonstration available. Debt and insurance forces sale. Cost £9341, offers over £7000, or may split. Tel: 081 546 6335

AUDIO RESEARCH SP10/II, recent valves, perfect condition £1,100 Magneplanar MG1(a) panel speakers £390, Linn Basik turntable with Akito arm and at OCS £150. Tel: Richard: 0707 2S1952 8pm - 11pm.

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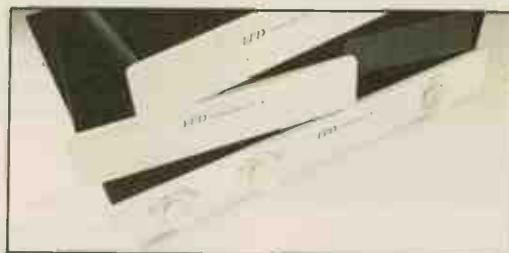
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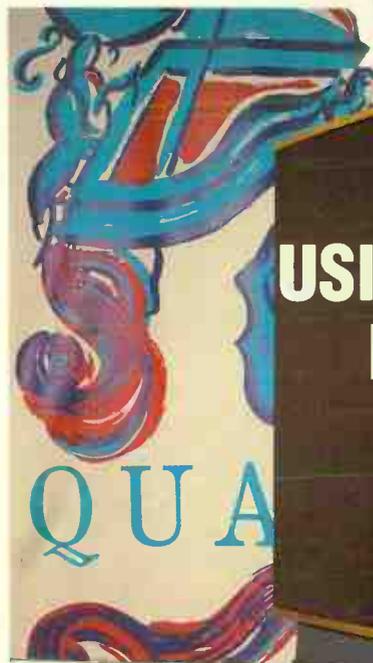
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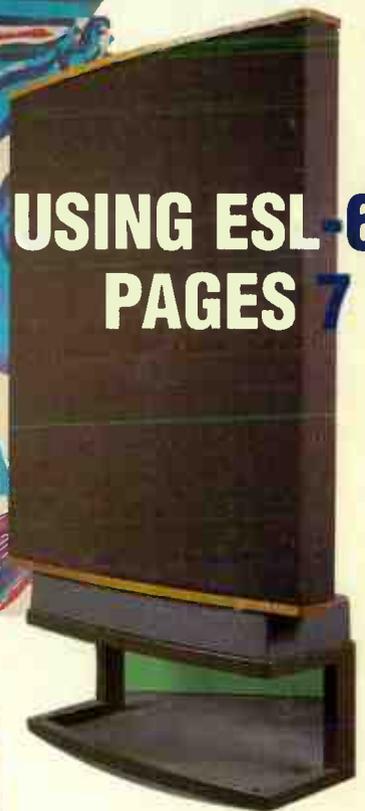
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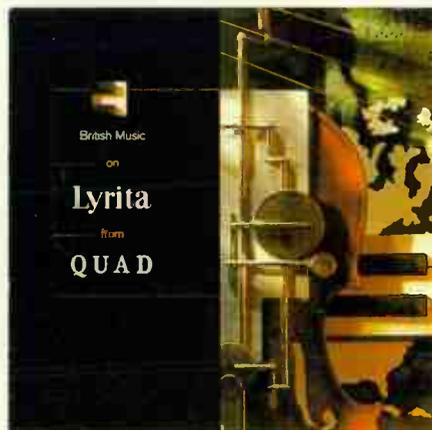
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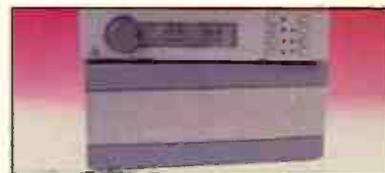
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UNWRAPPING A QUAD 66 SYSTEM

Eric Braithwaite reviews a complete system from Quad. The system pictured here shows the Professional version of the ESL-63 loudspeaker and the 306 power amplifier.



It may seem odd to begin a review of Quad's '66' system with an ode in praise of packaging, but I don't think I've had so much pleasure unwrapping anything since I took the ribbon of my first Easter egg. Quad's gear was beautifully wrapped. As always, the manuals are

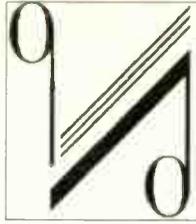
equally beautifully designed and printed, which adds to the pleasure.

This present was a complete '6' series set up: 66 pre-amplifier, 66FM tuner, 67 CD player, 606 power amplifier and ESL-63 loudspeakers. All (apart from the speakers, of course) entirely remote-

controlled from that wonderfully elegant coffee-table remote control. ESL-63s were supplied, but I used my own pair (just serviced and checked against Quad's own reference) the spare room already being full to the gills with boxes.

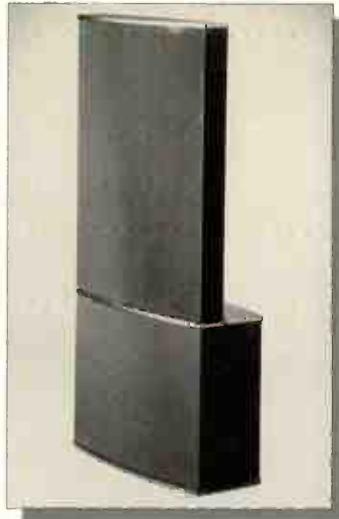
Unfortunately, while the Accessories

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Both Bartlett's stores are able to demonstrate the full range of Quad electronics. The London store is also able to demonstrate the ESL 63 electronic loudspeaker along with the Gradient SW63 subwoofer. The Gradient SW 57 is also available for demonstration although a few days notice is required. Demonstrations on any of the above loudspeakers & subwoofer combinations can be carried out at Bartlett's Woking store although seven days notice is required.

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boxes disgorged plenty of interconnect and enough mains cables to allow the four components to power and supply signals to each other, there was no IEC cable to be found to plug the whole caboodle into the mains. Dealers, will, however, make up the lack.

While all the components, excepting the pre-amplifier, have already been reviewed in Hi-Fi World, it's worth re-capping. Not a single item has much more than a single on/off switch and a display spoiling the smooth lines - though part of the decorative glossy black flash on the CD player turns out to be the drawer Open/Close button which is not duplicated on the remote. All programming is done from this control, whether it's setting volume level, balance, Quad's unique 'Tilt' and 'Bass Step' tone functions, persuading the tuner to memorise its nineteen station pre-sets or re-arranging the tracks on a CD. As I've said before, one of its prime virtues is that it's powerful enough to function even on top of the set-up, or pointed in the opposite direction to the receptors, which always startles visitors. It can also be powered direct from the pre-amp tuner or CD player if the battery runs out. The various buttons are dual-purpose to cut down the clutter; using 'Search' to scan the airwaves is logical, but pressing the 'Track' buttons to select FM presets is a little unfamiliar at first.

Being a devout hater of 'Up/Down' push buttons on tactile grounds and equally of motorised volume controls, it's a pleasure to have continually-rotatable knobs on the remote for volume and balance and to see only an oval orange segmented display on the pre-amp to show the volume level. Undemeath this is an equally effective segmented display to indicate balance left and right, while sources selected are back-lit legends and there are graphical representations of the tone filter, treble/bass 'slope' and bass-step tone control options.

All these will be familiar to Quad users of old, but less so to those used to simpler 'cut and boost' arrangements. They allow for a subtle re-equalisation of those recordings with an unusual tonal balance either from the mono days or when the balance engineers for one reason or another would have had 'could try harder' on their end-of-term report.

Having recently discovered that the retail price of the now superseded 405II power amp was £405.20 (!) I now scour Quad manuals for subtle jokes. In the supplementary sheet to the pre-amp's manual, which explains that the microprocessor software has been

updated to Version 1.04, I read that three quick presses on the relevant source-select button followed by one long one on 'Stand-by' will memorise tone settings for that source. 'Da-da-da-dum' explains the manual. Ah. So the software has really been updated to Beethoven, Version 5.0, then?

Those wanting the full works on the 606, the 66FM and 67CD, assessed as individual items, should go to their back copies of Hi-Fi World, or ring the Circulation Department. Quad's Crystal-based 67CD is one I - and others - rate very highly. At it's best, it is a crisp, detailed, well-defined player, with only a degree of 'looseness' in the bass to qualify otherwise unreserved approval. Similarly, the 66FM tuner gives away little against the top-rank, being less clinically detailed than the Audiolab 8000T perhaps, but gaining in real musicality and involvement. It entranced me for a whole afternoon of early music on Radio3 and a couple of long nights of GLR's rock programming.

Alas, since I last had one for review, unpleasant compression has become even more rife. The Quad

hi-fi tuner, it won't be the fault of the hi-fi industry or the 66FM, but the broadcasters.

The ESL-63s need no introduction. 'Reference class monitors' says it all. They have defined 'pin-point imaging' and accurate tonality in loudspeakers for a dozen years. Though they are fussy about room-placement to reproduce point-source imagery with the precision they are capable of, and lack the bass power of moving-coil designs, their mid-band clarity, purity and transparency are unparalleled, even at nearly two-and-a-half grand. Fed power - I've used them with top-class 200-watters - they will also rock, despite a common belief to the contrary.

In absolute terms, the pre-amplifier is less satisfying - there is an odd sensation of the sum being less than the individual parts. In some ways, the 66 exerts a beneficial influence; Jamiroquai, for example, sounding more like a dance-band than a collection of synthesisers, especially in the notoriously fake violin area which is so often infuriatingly



synthetic. In classical pieces as well as rock, partnered with the 63s, there was a feeling of restraint - a slightly velvet-gloved punch, a somewhat too-sweet top-end. Yet the whole system pulled off that rare trick of invisibly playing music so that one listened to the artist - whether Claudio Arrau or The Cure - without either forcing itself on the listener's attention, or reminding you that there were electronic circuits in the way. Too often, I find myself saying "Ah, I haven't heard that so clearly before; that's the power-amplifier (or the speaker)." But that is listening to hi-fi, not music.

Music, consummately, is what the Quad system is for. To temper the reservations, I have heard the 66 preamp and 606 power amp drive Sendor LS3/5as with real dynamic verve and less of the slight veiling - compared, it should be said to what I've been listening to for the last few months, all of it costing far more - than came through the 63s. Add the touch-button remote control, and you have a system of great refinement and of acknowledged accuracy, yet without the sort of hair shirt speciality that so often marks out top flight hi-fi systems ●

66FM, though a little more forgiving than the old FM4, is still so ruthless a monitor of the airwaves that I found most of the eighteen stations I programmed in damn near unlistenable. Widespread computer programming by the number of beats per minute - even on Classic FM! - makes it worse. If this last decade of the the twentieth century sees the demise of the

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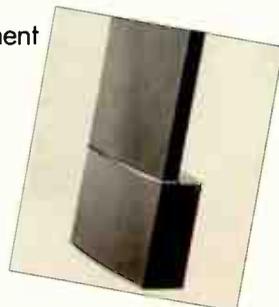
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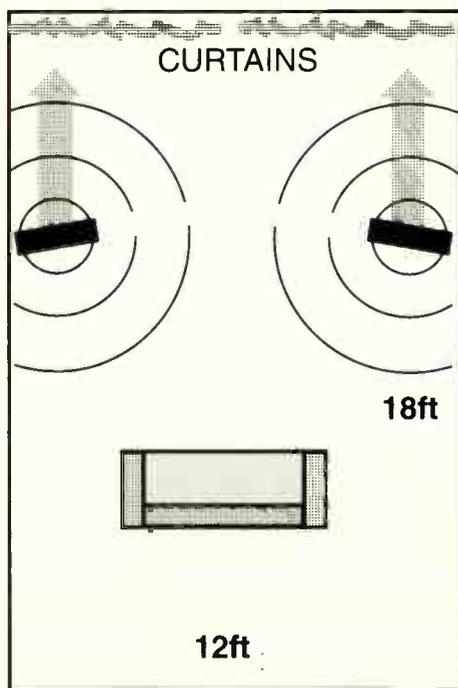
USING ELECTROSTATICS

Noel Keyword, who has used Quad ESL-63s in many rooms and systems, explains how to get the best from them.

Quad electrostatic loudspeakers have a reputation for being difficult to use. It isn't entirely undeserved, but most of the problems are easily overcome.

First, let's look at the most obvious difficulty - size. Being a panel 26in wide and 37in high, the speaker is wide. The base isn't very deep, but because the panel radiates from the rear as well as the front, it cannot be stood against an end wall. However, this speaker can be put against side walls and in some rooms this positioning turns out to be fairly convenient.

Rear radiation from the panel is something of a problem, since it is unwanted. Ideally, the '63 needs a fairly large room (18ft x 12ft minimum) to blend in visually and to 'lose' rear output down the length of the room behind the speaker (see diagram). The common rule-of-thumb is to operate the speaker one-third the way up the length. In a room 18ft long, this would put the speaker 6ft or so in front of the end wall.



The Quads need space behind them and, preferably, soft furnishings to help absorb rear radiation. They can be stood against side walls though, which can be convenient.

Heavy curtains and furnishings behind the speaker absorb rear radiation. I hang double-curtains of heavy carpet felt roughly 4in behind the speaker to do this job, but its effectiveness is limited at low frequencies. There are various ingenious ways to absorb the rear sound, but do not consider using a closed box.

Another feature of the ESL-63 worth knowing is that the front mesh protection grille beams sound downwards toward the carpet. The usual solution to this is to raise the speaker up by about 8in or so and tilt it backward, something both Stand and Deliver (not now manufactured) and Quad recommended GFD speaker stands achieve. Doing so will make the electrostatics sound brighter and clearer. Ideally, any stand that lifts the speaker should have a solid front so as to extend the baffle right down to the floor to improve bass. A chipboard, MDF or plywood stand can be made to raise the speaker, tilt it back and support rear sound absorption curtains.

The other big difficulty is price, but ESL-63s can be picked up second-hand. Expect to pay around £750-£1000 a pair. Whilst the original electrostatic would arc when over-driven, perforating the drive film, the ESL-63 has elaborate protection circuits and it is a reasonably safe second-hand purchase. All the same, Quad recommend you check for noise (crackling or popping) when switched on, but not playing music. A slight rustling, especially on damp days, is to be expected. Then play music and ensure they sound OK.

Early models had a crude compressor circuit to prevent music over-driving the speaker, plus a crowbar to short the driving amplifier if things got too bad; later models have a special fuse and crowbar, plus diode protection, which affects the sound less at high volumes. Otherwise, the speaker

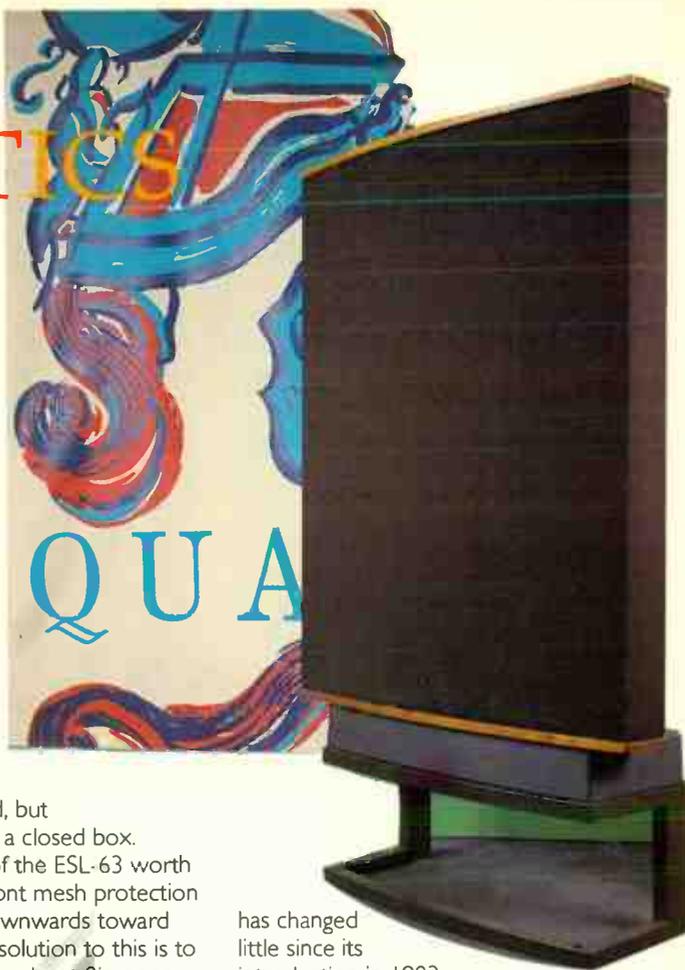
has changed little since its introduction in 1983.

The most common form of damage to the ESL-63, Quad told us, is burnt out protection circuits, probably because sensitivity is low at 83dB (our measured value) and people tend to over-drive them to get volume. Quad, however, will fit the latest protection circuits to a pair of speakers for around £100, so getting such damage repaired is not too expensive. Anyone experienced can get a renewal kit from Quad and do it themselves. Overseas readers may be interested in this option, since it allows an upgrade of Quads to meet the latest spec.

Amplifier power requirements are specified by Quad as 50watts minimum and 55V peak (190watts into 8ohms) maximum. Quad recommend their 306 (50watts) amplifier for small-ish rooms up to about 18ft long, and their 606 (140watts) for larger rooms. Our view, from long experience, is that amplifiers of 40-80watts are most sensible for the ESL-63s.

What amplifiers work best? Apart from Quad's own, which have suitable protection circuits, high quality solid-state amplifiers from DPA, Sugden, Rose, Michell and John Shearne we find work well. It's wisest to audition an amplifier in conjunction with the speaker before buying. And be very careful of valve amplifiers - some do not like the speaker we have found, possibly because of incipient instability; the EAR834 is a good match we can vouch for though, as is our own 300B amplifier.

The Quad is a difficult load, as our analysis shows. Below 15Hz it drops to



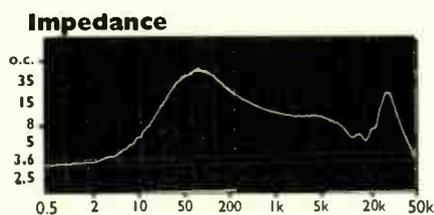
2.7ohms, which will draw power if LP warp signals are fed to it. There's a bass resonance at 60Hz and a treble resonance at 20kHz, both of which produce significant reactive swings. The high frequency resonance presents 1.6 μ F of capacitance at 20kHz, which may well upset amps of marginal stability. I strongly suspect this is the reason some not-too-clever valve amps have problems, but in truth well designed valve amps can handle this sort of load.

A good cable we'd recommend is Ortofon SPK300 at £7.50/metre. Or you can choose Quad's own simple copper cable, QLSCF2 at £3.50/metre. Don't forget that the speakers need a mains supply too.

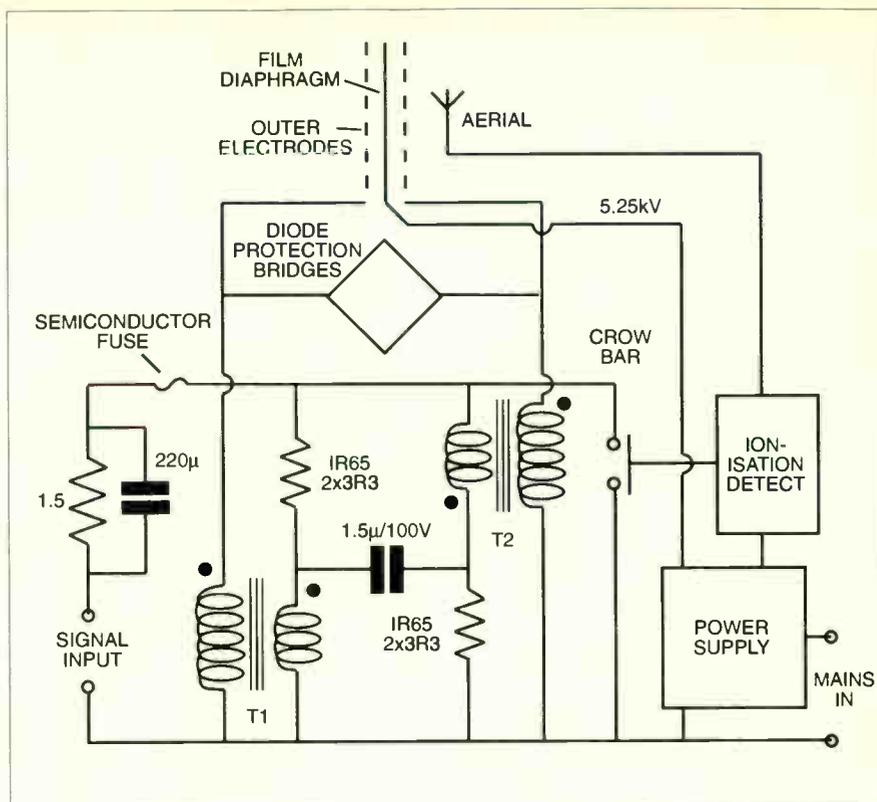
Although it is possible in some setups to hear Quads delivering powerful bass, which is always quite a surprise, in general they give a somewhat mellifluous sound at low frequencies, lacking deep bass or real punch. Consequently, subwoofers are a topic very much on the agenda amongst Quad users. I have used Celestion SL6000 subwoofers (expensive, large and heavy, not now manufactured), but their crossover doesn't integrate the Quads in well, since the speakers start to roll-off below 250Hz, but the crossover brings the Celestions in at 100Hz, leaving quite obviously divorced sounding bass. Better alternatives are now available.

A surprisingly effective one is the REL Stadium powered subwoofer. It must be carefully tuned in to match, using its frequency and level controls, to avoid boomy bass, but it can deliver very deep bass and the Quads seemingly go much louder with it. This can only be a psycho-acoustic effect, because the REL does not remove bass from the feed to the speaker, unlike the Celestion and Gradient subwoofers. Quads with a REL put up a good challenge to ordinary loudspeakers in terms of power and dynamics, even if their combined cost does go beyond £2000.

Finally, there is the Gradient SW-63 subwoofer that matches in well and gives excellent results. By removing the need to reproduce deep bass from the Quads, it allows them to go louder. The price is £1650 and they can be auditioned at Quad dealers. We review these separately of page 15 of this supplement ●



The impedance dips to 2.7ohms below 15Hz and there are two resonances which introduce reactance. At 20kHz the speaker acts as a 1.6 μ F capacitor, which can upset amplifiers having a limited stability margin.



Amplifiers must drive two step-up transformers that provide a high voltage push-pull audio signal to the fixed electrodes. On early models a compressor circuit acted in the primary circuit to limit the audio voltage reaching the plates. Current models, after Serial No 29000, possess a network of diode bridges that clip the high voltage audio signal in the secondary circuit. An upgrade kit is available from Quad.

The diagram also shows how the film is polarised to 5.25kV from an internal power supply and that an ionisation sensing aerial causes the crowbar to operate, blowing the semiconductor fuse, if arcing from severe over-drive occurs.

QUAD STANDS

Stand and Deliver - an open frame stand that raises the speaker by around 8in and tilts it backward. Gives a clearer sound, without losing too much bass, but not now in manufacture.

Arcis - Not now available in the U.K. Raises the speaker high, but does not tilt it. Good for stripped down Quads, but gives light bass.

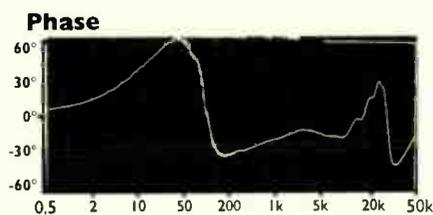
GFD - Tilts the speaker back and possesses castors for ease of movement, but does not raise it. Recommended by Quad. G.F.Deane, Moorlands Garage, Chorley Old Road, Horwich, Bolton BL6 6BB Tel: 0204-843382.

SUBWOOFERS

Gradient SW63 - Sits underneath the Quad, acting as a stand. Needs a separate stereo amplifier for bass drive. See our review on p15. Available from Quad Electroacoustics Ltd, Huntingdon, Cambs PE18 7DB. Tel: 0480-52561 Fax: 0480-413403. Price £1650/pair

Celestion SL-6000 - Not designed for the Quad and does not match perfectly with standard crossover, but has bass of unlimited depth. Discontinued, but may be available second hand. Celestion International, Ipswich IP3 8JP. Tel: 0473-723131. Price was £1800

REL Strata £495, Stadium £795, Stentor £1495, Studio £2995. Powered mono subwoofers. We have tested the Stadium, which possesses its own 100watt amplifier and low-pass frequency/level controls for tuning in. Powerful and deep bass; an impressive performance. Harman UK, Unit 2, Rowley Lane, Borehamwood WD6 5PZ. Tel: 081-207-5050.



Two resonances are revealed by the phase plot above, one at 70Hz and another at 20kHz. The speaker is reactive around these frequencies.

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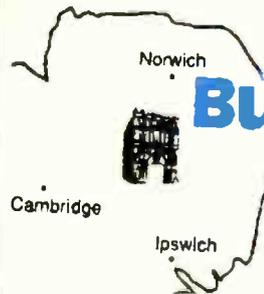
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TECHNOLOGY.

REVIVING THE QUAD 22/11 VALVE AMPLIFIER.

Designed by the founder of QUAD, Peter Walker, the 22/11 offers an attractive alternative to modern amplifiers, says Haden Boardman.



The Acoustical Manufacturing Company Q.U.A.D. II (Quality Unit Amplifier Domestic Mk II) is possibly the best known and loved 'classic' hi-fi amplifier in Britain. With around 120,000 units sold, they are also reasonably common.

Introduced in 1954 with the matching 'QCII' pre-amplifier, it was an instant hit and remained basically unchanged throughout 15 years of production.

When stereo records and equipment started to creep on to the scene, the QUAD 22 control unit became available. This has about the most comprehensive set of controls imaginable but by modern standards, the pre-amp is not quite up to the mark. It is a little too flexible, possessing input matching 'pods' on the rear for a wide range of the different playback characteristics, all of which tend to dull the overall sound. On the plus side, this must be the first stereo pre-amp to have defeatable tone controls.

Another negative aspect of the 22 is that it scavenges power from just one 11 power amp., compromising the balance. To make matters worse, all of the tuner's H.T. rails are switched on and off from the pre-amp also. As the entire ensemble is powered from just one poor old QII power amp, it tends to fry the mains transformer.

A Quad II is rated at 15 watts output for an input of 1.4 volts. This makes the QUAD a pretty insensitive power amplifier by the standards of today. If you intend to use a more modern pre-amp bear this in mind; unity gain cathode followers and passive pre-amps are totally out. Also if you like to disturb the

neighbours, high sensitivity loudspeakers are the order of the day.

Sonically, the QUAD II is a peach. Warm, lush and extremely romantic. It suits Mozart more than Mahler; flatters 'Fitzgerald over 'Franklin. For some it can sound too soft, with not enough fire in the performance.

Technically, it's a very interesting amplifier. It was one of the first to use a version of the so called 'Ultra Linear' output stage. Mr Walker's circuit differed from Hafler & Keros circuit by connecting the cathodes of the output valves to the output transformer, instead of the screen grid; it also predated Hafler & Keros. If you want more on what P.J.W. describes as 'Super Ultra Linear' read the article he wrote with D.T.N. Williamson in the September 1952 'Wireless World'.

One other unusual detail is that this is only a two stage amplifier. Two EF86 pentodes act as both an efficient phase splitter and driver, supplying the two KT66 tetrodes with the appropriate signal. Most circuits of the day used three stages, the famous Williamson four. Overall negative feedback is quite low compared with any other design from the period, and the circuit very neat and simple.

On the service side, all electrical parts are still available from QUAD's world leading service department. How many companies will even look at products they started to make nearly 40 years ago - and do it for pin money prices as well. No one can even approach QUAD for the quality of back up service.

If buying a set, look very carefully at the under side. Check that the mains transformer has not melted all over the inside. Don't worry about a tiny bit of wax, that's quite normal. But too much

could in the long term spell trouble. All of the passive components are pretty cheap. The handful of components that usually give trouble are the coupling capacitors (C2 & C3 - 1µF/350vdc), the cathode resistor bypass capacitor (C5, 25µF/50vdc) and the anode resistors of the EF86's go high value with age (R5 & R6, 180kΩ).

Needless to say, you must avoid 'modified' QIIs like the plague. A handful of companies in the past have persuaded people to fit voltage doubler power supplies, EL34 output pentodes, anything they can do to boost the power output.

I'm afraid it's all a load of cobblers. Watch these vandals, Mr Walker knows best.

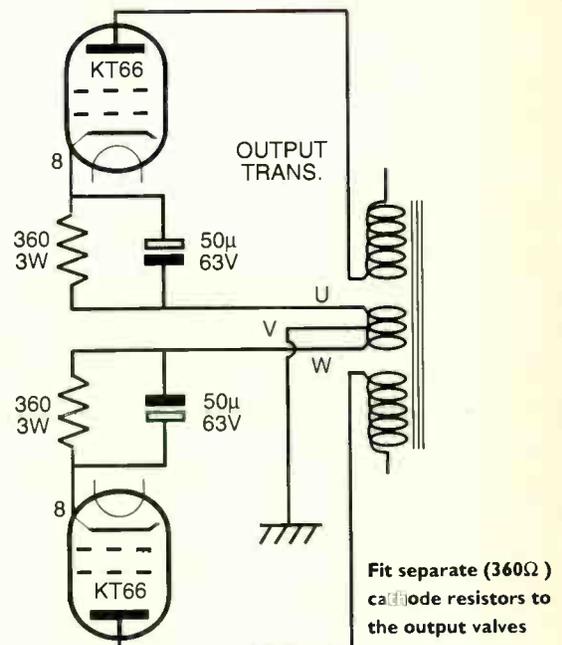
QUAD IIs were designed for 15 watts output - not fifty.

The only tiny hole I can pick in a QUAD II is the fact that P.J.W.

chose to use a common cathode resistor of 180Ω for the output valves.

This allows a slightly 'leaky' output valve to 'turn off' the other good valve; it was very difficult to get wirewound resistors of high tolerance in the 1950s. The voltages on the cathodes must be as close as possible for perfect push-pull operation. These days, of course, you can get high tolerance wire wounds and for increased reliability, without changing the sound quality, try fitting individual 360Ω cathode resistors (see circuit). It's the only mod you should ever consider executing on a QII. Happy listening ●

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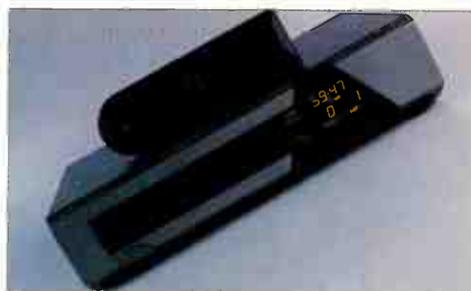


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Adding a Gradient to a Quad isn't roadmenders' slang for building a slope into the quadrangle of an Oxford college. It's all about supplementing what is often considered to be the somewhat sparse bass from a pair of Quad electrostatics - in this case the ESL-63s. As it happens, adding a pair of Gradient subwoofers from Finland also helps those owners who feel their ESL's are vertically challenged. Including the spikes, the whole will stand another eighteen inches tall. Each is parked neatly below the ESL's own base - no garage-type re-engineering required, only an Allen key to lock them together.

The result is certainly imposing and a pleasant aesthetic match, since the front grille is curved to follow the shape of the '63 and covered with cloth to suit. They look as though they were made for each other, hardly surprising, since, as Alice would say, they were. Originally, I believe, conceived by Quad's Finnish distributor, they saw the light of an English day rather than that of an Arctic Circle night about three Penta Shows ago, powered by a Quad 306 power amplifier. It's worth bearing in mind that adding the Gradients to your listening pleasure involves a trifling additional expense: one power amplifier for the Quads themselves plus another for the subwoofers. In an all-Quad system, the 306 is certainly cost-effective.

Since the Gradients are supplied with an active crossover, some experimentation is possible to create a preferred sound balance. Since electrostatics are also notoriously fussy about room positioning, prospective owners should be warned that immediate results aren't on the menu. Setting up the Quad/Gradient combination is very much a matter of tasting and testing. That, and twiddling the level control while switching the midrange position on the crossover unit can occupy many a happy hour. It's just like the old days, when electronics and speakers had a wider range of - and often touchy - temperaments.

I eventually left the mid-range switch at 'Off', finding the alternatives too coarse. Both tended to limit the ESL's normally smooth and wrinkle-free midrange, either in dynamic range or by taking images a fraction too far back. Very subtle, but still too noticeable for my liking. Luka Bloom's voice on his *Riverside*, for example, had a grainy edge that overlaid that Kerrygold Irish lilt.

Finding the best average position for the subwoofer level was trickier. Too far

one way and the double bass in REM's *Automatic for the People* boomed; too far the other and the fetching deeper resonance of acoustic instruments on this and other albums the Gradients produced was diminished. Life is full of compromises.

With an effective compromise reached eventually, it was a salutary discovery that the Gradients are about bass enhancement more than bass addition. They won't turn Ragga freaks on by transforming ESLs into electrostatic Cerwin Vegas or PA horns. Speaking of horns, the Gradients do add that extra

deep rasp to brass which makes a symphonic recording more of a real, live, experience. Belatedly celebrating the anniversary of Tchaikovsky's death with an 1812 overture (well, it was a good excuse!), selective twiddling with the level setting markedly increased the cannon's bore and gunpowder consumption, with a very satisfying thunder - and response from the neighbours! And equally gratifying, but less appealing to the destructive child in me, a real blare of brass.

At times, the Gradients hardly appear



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Eric Braithwaite and Dominic Baker - both ESL-63 users - listen to the Gradient SW-63 dipole sub-woofers designed specifically for this loudspeaker



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to be in circuit at all, though there is always a subliminal awareness of them underpinning the structure of the music. Joe Lovang's saxophone on *What We Do* from the John Scofield Quartet, for example, sounded that much larger than on sub-wooferless ESLs. In an odd way, however, bass guitar notes failed to achieve a similar increase in body-size, the timing of rapid plucked notes less precise or distinct. While double basses accompanying jazz musicians bloomed, they also sounded a trifle lax. Whether other amplification (that used for this test was DPA Digital) would tighten up the subwoofer's timing is a moot point. While the bass in Jim Lampi's 'TV Weather' rumbled along the floorboards, the notes also had a tendency to roll into each other. There was no mistaking the sheer weight, however.

Like the ESLs themselves, the Gradients are best at the subtler aspects of bass reproduction rather than gross exaggeration. Stadium Rock PAs they are not, though a good bash does not frighten them. Quad owners who are nervous about sudden shut-downs after winding the volume control a touch too far will also welcome the relief they provide to the ESLs, allowing them a slightly easier ride and to go a notch or three louder, through that splendid articulate midrange and image-pinpointing treble.

Not quite as supremely articulate or transparent as the Quads themselves - it would be an awful lot to expect from an add-on unit using moving-coil drivers - the Gradients do add a good dollop of grunge, grind and stomach-wall wobbling. Good for those of us who occasionally long for a more downright visceral

experience to add to the infinite, perhaps more intellectual, sonic delights of the ESL-63.

Dominic Baker says

I have been using Quad ESL-63s for nearly a year now - and a very enlightening experience it has been, too. The pair I use are stripped down to their 'cling-film' dust covers, on stands that lift the centres to ear level and have thick carpet felt draped behind to absorb backward-firing treble energy. They are positioned so that their outside edges touch the side walls, which effectively act as an extended baffle.

Used like this I hear an uncoloured, lifelike sound with an image you can walk into - and plenty enough bass power to fill a room. Though a little bloom in the bass can be heard, using a dry-sounding Deltec 50S power amplifier prevents any exaggeration in this area. They sound simply superb, so any sub-woofer intended to go with them has to be of equal quality.

I have spent a long time experimenting with subwoofers for the '63s. They have included SL6000s with a special crossover developed by Noel some years ago, a REL Stadium - now used to great effect by Richard Kelly with a pair of the original ESLs - and now the Gradient SW-63s. The SL6000s and special crossover were superb, but take hours of careful positioning to match them to a room. The Gradients suffer from a similar problem. Until you get them working with the room, usually involving swinging them through 90 degrees, they sound like four cheap bass drivers mounted on a piece of wood.

When they work with the room though, the bass becomes as clean and free from colouration as the 63s are themselves.

There is one other factor involved: the active crossover. The one supplied with the Gradient uses a cheap plug-in-wall power supply and general purpose op-amps for the filtering. For what amounts to a £4500 loudspeaker system, plus the extra power amplifier, I would expect something a little more sophisticated. The idea of squeezing the signal from several grands' worth of front-end through op-amps costing little more than £1 each, and then back out to be listened to through the most revealing loudspeaker I have ever heard doesn't appeal. It adds a coarseness to the midband and doesn't do a particularly good job of integrating the 63s with the subwoofers.

For these reasons I wouldn't sacrifice my Quad set-up for the Gradient approach. In many ways, I feel the REL integrates better and it has the advantage of being self-powered and insensitive to placement. If all you are after is a little bass reinforcement, my advice would be to go for the REL - it has a lovely rich quality and it really plays a tune well. If you want deep dipole bass, the Gradients are excellent 'speakers, but the crossover could be better and to integrate them into the room properly, the 'speakers must often face outward, meaning the 63s won't then sit neatly on top - that's a problem with dipoles. ●

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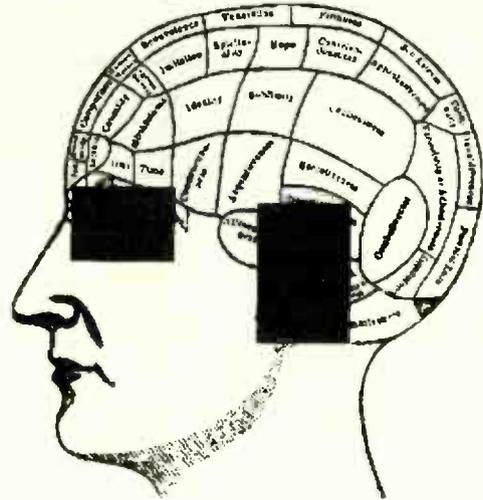
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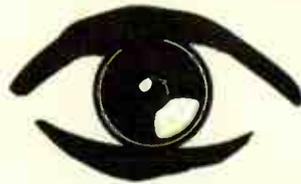
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BRITISH MUSIC ON LYRITA FROM QUAD

By Eric Braithwaite

Richard Itter, Lyrita's retiring owner and sole motivating force has built a reputation for recordings of sonic excellence that has made vinyl examples highly collectable. Concentrating on under-played and seldom-recorded British repertoire, Decca's most famous and respected team - Kenneth Wilkinson and James Locke - established the Lyrita 'sound'. Though Itter's label was late coming to CD, the house-style has remained constant for over thirty years.

The Quad connection arises from Itter using Quad Electrostatics - stacked Quads, no less - and electronics in his music room. It led to a long association, culminating in Quad being given the run of past and current recordings to choose from thirty-five years of Lyrita archives.

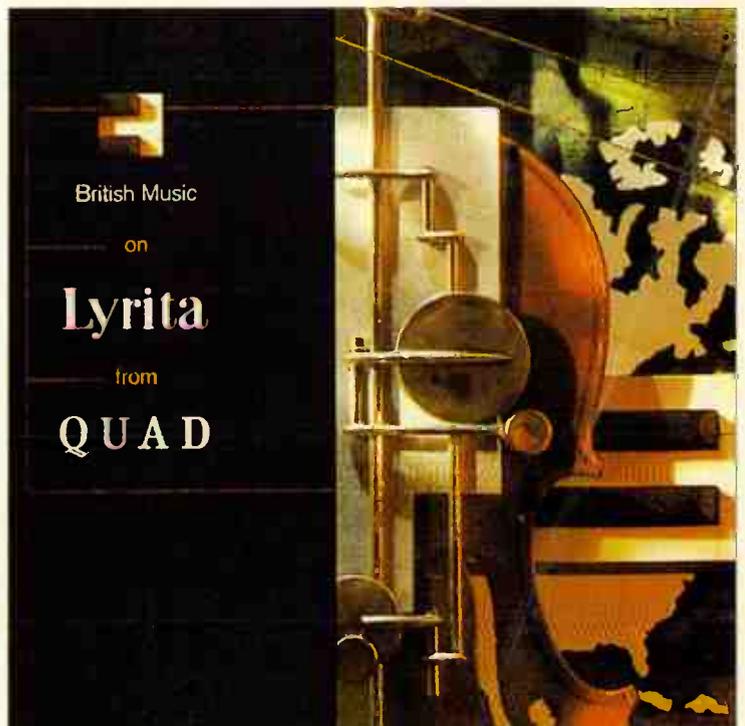
Now, the monitoring speakers are ESL-63s and the Quad connection will be strengthened with sponsorship of new Lyrita recordings, as well as early instruments on the Oxford Isis label and The Sixteen on Collins. "It continues the association we've started with the Isis label and The Sixteen," said Quad's Ross

Walker, "and we'd like to expand. Recordings for 1994 on Lyrita are not decided yet, but we'd like to do some complete works, including some so far unrecorded British compositions."

"I'd be quite interested in recording some new works," he added. They are most likely to stem from the traditionalist school rather than the minimalist - don't necessarily expect Fitkin or Martindale or

other refugees from the Factory label. Thanks to this new association, it looks as though we shall soon be exploring some

fascinating repertoire that would otherwise have remained unheard and very likely unperformed ●



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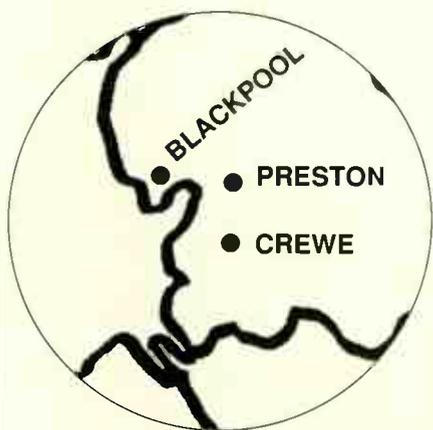
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**HI-FI NEWS - MARCH 1992
said in conclusion...**

The Gradient woofer has not transformed the ESL 63 - rather it has released it from restrictions determined by a need to make the standard speaker a full-range device. With the SW63 the electrostatic blossoms into a true high end speaker of such integrity and ability that no sensible criticisms are worth voicing. This is a most graceful performer which again shows the fundamental quality of Peter Walker's marvellous creation. It comes strongly recommended.

I can think of no better upgrade path for a '63 owner with ambitions, while as an all-in-one purchase the high review rating equally applies.

TESTIMONIALS FROM SATISFIED OWNERS

Mr. Davidson of Co. Durham.

"It really is a delight to listen to this combination of ESL 63's and SW 63's. The music seems to be more solid and I find the imaging properties of the Quads are enhanced. The extended bass is a boon when listening to large orchestral and organ works, yet the treble is clearer. Altogether a most successful marriage."

Mr. Tyler of Basingstoke.

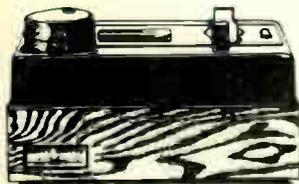
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