ALIGNMENT PROTRACTOR for your record deck and SME IV reviewed

LINN KREMLIN tuner - full review plus comparison with Naim NAT-01

FIVE BUDGET TUNERS around £100 compared
Indoor aerials tested

SCOOP! MICROMEGA MICRODAC
CASTLE CHESTER loudspeaker

COMPETITION Win an Audiolab 8000DAC CD converter
Our new CDS CD player.
Something new from Naim is not to be treated lightly. Least of all by Naim itself.

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It has to be so good that people whose opinion we respect say of it: “A reference class machine without equal”
STEFAN SCHICKEDANZ AND STEFAN ZENKER, HI-FI VISION, GERMANY

“The CDS easily surpassed all that had gone before it”
MALCOLM STEWARD, HI-FI WORLD

“A landmark product in the development of the Compact Disc”
PAUL MESSENGÉR, HI-FI CHOICE

Enough said? Then talk your way into your nearest Naim dealer and lift the lid on our CDS for yourself.

Now you know what’s in a Naim.
Naim Audio, Southampton Road, Salisbury SP1 2LN, England. Tel: (0722) 332266
Contents

**AMPLIFIERS**

EMF AUDIO SEQUEL: The man behind the Creek 4040 returns with a new £300 integrated amplifier. 30

CARY CAD2A3 POWER AMPLIFIER: An American triode valve power amplifier, sparking with chrome. Does it shine, or is it tarnished? 49

**COMPACT DISC**

MICROMEGA MICROC DAC: Micromega's cheapest ever product is a new Bitstream convertor. Exclusive test. 36

DENON DCD-2560: A CD player with a speed control? Does it play 78s? 64

DELTEC PDM-ONE MK III: Deltec's original convertor Improves again. We look at the latest version, with DAC-7. 68

**CASSETTE TAPE**

MARANTZ SD-62: The latest recorder from the Marantz stable. Does it match their CD and amplifier thoroughbreds? 74

**LOUDSPEAKERS**

CASTLE CHESTER: Beautiful, Yew-finished floor-standing loudspeakers based on an idea from the distant past. 40

WHARFEDALE 51S: The latest loudspeaker from one of the oldest names in the business. 55

CELESTION 700: Hi-tech flagship loudspeakers made from space-age Aerolarre 66

HEYBROOK PRIMA: Budget loudspeakers that can sit next to your telly. 73

**TUNERS**

LINN KREMLIN: Linn's first tuner is a technological wonder but at a price. We check out the sound per pound. 16

BUDGET TUNERS COMPARED: We look at five models around £100. 20

DENON TU-260L PIONEER F-229L JVC FX-335L TEAC T-X3000 SANSUI TU-X11L 20

INDOOR AERIALS: Staying with the budget tuner, how to pick up a signal without an outdoor aerial. 28

KREMLIN VS NAIM NAT-01: The obvious comparison. The two titanic tuners tussle. Which one is best? 63

**TURNTABLES**

SME SERIES IV TONEARM: "The best tonearm in the world" it says on the box. The finish seems to bear this out. Do we insert "definitely" or "probably" in the claim? 58

ALIGNMENT PROTRACTOR: This month's free gift. We explain how to align your cartridge correctly. 60

**FEATURES**

RECOMMENDED SYSTEM: We present a system with sure-fire results, made up from components we have recommended in the past. 45

QUADS AT SMITH SQUARE: We visit a Philips recording session, where we found them using Quad Electrostatics and Celestion sub-woofers as monitors. 51

COLLEGE HI-FI: Where to study for a career in the hi-fi industry. 71

COMPACT DISC TWEAKING REPLIES: Painting the outer edges of CD's green, or gently wiping them with Laserguide evoked strong feelings. We reply to the letters we received. 79, 81

**REGULARS**

NEWS: All the latest from around the hi-fi scene. 5

LETTERS: Our sackfuls of comments seem never ending. 10, 11, 77

COLUMNS: More mutterings from our muses. 12

TWEEKEY CORNER: This month, more on the Mana experience, together with cables so thick and strong that you could tow a supertanker with them. 38

QUERIES: Answers to your hi-fi questions. 82

SPECIAL OFFERS: Strange and wonderful hi-fi accessories which can be bought through this magazine. 86

BOOK REVIEW: We look at an encyclopedia of radio broadcasting. 89

LISTINGS: Our fave raves! 90

NEXT ISSUE: For the impatient among you, a brief view of next month's goodies. 110

**MUSIC**

OUR EXPANDED REVIEW SECTION:

ROCK by Giovanni Dadomo and Malcolm Steward 93

JAZZ by Simon Hopkins 100

CLASSICAL by Peter Herring 103

RECORD OFFERS: Our own ever-expanding selection of good quality music available on LP, CD and DAT by mail order. 111

**COMPETITION**

WIN AN AUDIOLAB 8000DAC DIGITAL TO ANALOGUE CONVERTOR. 56
If you can hear the difference between a solid state amp and a tube amp, wait until you hear the difference Groove Tubes can make to your hi-fi.

Groove Tubes are much more than simply matched sets of valves; each one is precision tested in an amp circuit linked to a computer to the highest levels of performance under actual operating conditions. Clean true sound quality balanced sustain and even decay rate are amongst the qualities Groove Tubes engineers test for. The result is a perfectly balanced set of tubes that will work harder and sound infinitely better than conventional valves.

Whatever kind of music you prefer, you'll appreciate it better with Groove Tubes. Simply changing valves can create a whole different set of tonal characteristics to suit any style of music.

Hundreds of professional musicians from The Allman Bros. to ZZ Top use Groove Tubes in their stage amplification. Acts like Tina Turner, Genesis and Chris Rea. Now you can appreciate the same standards of reproduction as on the actual production in your own living room. So, fit Groove Tubes, sit back, and hear the difference.

No one was ever sorry they bought the best!
HARMAN KARDON
TAKE A BOW
The new entry-level £169 Harmon/Kardon TU9200 tuner boasts the same bowed fascia of other recent Harman products. A replacement for the TU909, it has sixteen AM, sixteen FM presets and a signal strength meter. Details from Harman UK (0753) 769 11.

H-K have also announced two Compact Disc multi-changers based on the carousel principle, where five discs are loaded into a circular tray. The TL8500, at £449 and TL 8600 at £549 use a PWM (Pulse Width Modulated) DAC similar to that in the HD7500 and HD7600 players, with 35-key wireless remote control, a display which switches off and, in the 8600, motorised output level control. These players, too, sport H-K’s new bowed fascia.

MOTH CLEAN UP THE
RECORD INDUSTRY
Given such depressing figures from the BPI concerning vinyl, what better way to cheer up your depressed record collection, than to treat them to a wash and brush up. The latest record cleaning machine comes from the Moth Group.

The £299 Moth RCM cleaner is a powered machine, operating as a wet/dry vacuum cleaning system, similar in essence to the well known Keith Monks device. It features a powered turntable, a hand held brush fluid applicator and a drainable internal reservoir. All of this is housed in a metal enclosure. As it is made in the UK, the Moth RCM is only about 60% of the cost of a similar US cleaning machine.
In her native Ireland
Mary Black outsells U2.
The New York Times
wrote that she had “a voice to die
for”. Each of the five LPs she has released over the
last five years all went gold or platinum.

Babes in the Woods, her latest album, released at the
end of last year, is rapidly becoming a
reviewer’s standard and won Today
newspaper’s vote for “Album of the
Year”.

Next month on our cover we are
offering a specially compiled Compact Disc to showcase
Mary Black’s amazing talent.

All the tracks have been selected from her albums by
the singer herself. The April issue of Hi-Fi World (on sale
12th March) will give everyone the chance to hear the voice
that “has a soulfulness, passion and intensity that’s rare.”

Mary Black goes on tour nationwide this Spring.
Buy the April issue of Hi-Fi World and find out why the New
York Post predicts the rising of a new star.
HARROGATE HI-FI FAIR
After a false start - or false re-start - last year, the Harrogate Audio and Video Fair is back. Dates are August 5th to 9th, coinciding with the Harrogate Festival of music. A fair number (sorry!) of Hi-Fi manufacturers, having become weary of living out of suitcases, travelling constantly from one show to another in 1991, recently decided they would offer support to two major shows this year. The September Penta Show, for the South of England, will be one; Harrogate the other, for the North. Supporters of the August affair at Harrogate include U.K. companies like Arcam, Quad (welcome back!), Celestion, Mission, NAD, Heybrook, Roksan, KEF and TG1; Japanese companies Denon, Pioneer and Yamaha will also be there.

STATESIDE TUBE REACHES SUSSEX
The American Quicksilver range of hand-built valve amplification is being imported into the U.K. again. The line-up includes a pre-amplifier with dual volume controls and three inputs, including a phono stage, at £1,745. A moving-coil step-up transformer is also available at £315. Power amplifiers available are the 90w “Silver Mono” at £2,150 per pair, and two versions of the hard-wired, printed circuit board-less Quicksilver 60w monoblocs. With a three year guarantee (excluding valves) the mono power amplifiers cost £1,845; a pair; in the 8417G output valve version, price is £1,545. Importers are Studio 2000, The Well Cottages, 4 Station View, Wadhurst, East Sussex TN5 6RY. Tel. (0892) 88 4696.

READY, STEADY, ALMOST GO FOR DCC
The official launch of Philips’ Digital Compact Cassette is set for September this year with recorders available in the shops in Europe, the USA and Japan the same month. There should be five hundred pre-recorded DCC tapes on the market at the same time, so new buyers won’t be left short the way they were when Laserdisc first turned up on these shores. The first DCC machines will be “high end”, with new lower-priced models appearing every few months after September. MIDI-system, personal and car DCC players will follow within the year, say Philips. The build-up - lots of publicity on the new medium - begins in April when the first demonstration models will arrive and lucky reviewers and dealers will finally get to play. As the world is flooded with DCC players in September, Philips will be holding a party in Europe, the Dutch company has announced. Wonder who will get to go and wear the party hats?

SIXTIES SOUND, NINETIES IMAGE
Philips have marked the opening of their CD-1 (CD-Interactive) studio at Freeland House in Dorking with a disc of Sixties songs. Just add a CD-1 player, and a television, and you can select background film and text along with the music. The Dorking studio has been set up with a computerised ‘template’ so that producers can mix the images into their own choice of music without too many complications. We couldn’t see the pictures, unfortunately, but it all sounds fascinating.

IN BRIEF

BARTLETT TIMES TWO
North London retailers Bartlett’s Hi-Fi have opened a second branch at 11 Broadway, Woking. The store, complete with two listening rooms, is open six days a week from 9.30 am to 6 pm.

CUMULATIVE NIMBUS
Nimbus Records are expanding their production operations at Cwmbran in Gwent. Some new buildings, designed by the Company of Designers from Cardiff, will improve their manufacturing efficiency, said Nimbus Director Lyndon Faulkner.

GOLDRING TAKE A STAND
After the Black Satin loudspeaker stands and equipment supports Goldring launched at the 1991 Penta Show, the company has come up with a pair of open-frame speaker stands at mid-price. The eighteen inch MBS 180 stands cost £47.95 and the MBS 240, six inches higher, costs £49.95. Details from Goldring Products (0284) 701101.

MAKING CONNECTIONS
WBT of Germany have come up with a phono plug to delight all those who can’t use a soldering iron without burning their fingers. The new "CCS-System" phono plugs require no solder. All that you have to do is cut the end off WBT’s CCS (or Circular Contact System) cable, push the end into the plug, tighten, and there you have a connection which will withstand 10kg, all done inside twenty seconds. The beautifully-finished plugs are twenty-four carat gold-plated. Contact Absolute Sounds Ltd. on (081) 947 5047.

NEW DNM CABLE
DNM’s solid core loudspeaker cable, unchanged since its 1986 release, has been revamped. Originally, the solid core Rainbow cable had a central feedback return. This return was considered to be too advanced for today’s materials and so the central core has been dropped. This has also allowed the two surviving cores of the cable to have a slightly larger cross section than before, also giving them better spacing. The price of the cable still remains low, at around £4.00/metre.
Hi-Fi that speaks for itself:

8000A Integrated Amplifier
8000C Pre-amplifier
8000P Stereo Power Amplifier
8000M Monobloc Power Amplifier
8000DAC Digital-analogue Convertor
GLORIES OF GANDY'S GARDEN
Roy Gandy's Rega Research have been busy creating a new £198 amplifier to bring the cost of a complete Rega record playing system down to £600. The thirty watt Brio offers the same facilities as the Elex in a shorter case.

Rega have also come up with their own speaker cable. It's flat twin cable, made of two sets of 49-strand wires, each with a 2.5mm cross section. Plugless, the price of this clear PVC insulated cable is £1.58. Terminated with Deltron 4mm speaker plugs, a 3m length is £31.28 a pair, 5m £37.60 and 7m £43.92.

The news came along with a story which we couldn't resist:

"Roy, who knows which way is up, pondered the question of directionality for some time. Whilst giving it considerable thought he decided to walk contemplatively around his garden as he struggled with this problem. It was at the bottom of the garden that he came upon a fairy circle... Roy, not one to ignore an opportunity, asked for their views on the directionality of Rega cable. They responded that the cable should run so that the "Rega" can be read from the amplifier to the speaker. Roy, however, required a second opinion. Fortuitously a band of elves happened by and they said that was true unless the listening room suffered from the adverse effects of electro pollution. If this was the case, they suggested that only if small pieces of foil were stuck strategically on the cable would it be true. And so, Roy being a believer in fairies, elves, corn circles, fables, pieces of foil, myths and all things unexplained, did announce that the cable should read from the amplifier to the loudspeaker."

After Laserguide (see page 81) and the Green Pen (page 78) we too know which way is up. Or maybe we only think we do!

DAYLIGHT FLIT
David Roth, the man behind the inimitable Day-Sequerra tuners is to direct American company Acoustic Research's Engineering programme. Roth's company, Davidson-Roth, formed in 1984 to build the Sequerra FM tuner, has been acquired by AR's parent, International Jensen Inc. Manufacture of the Day Sequerra will be relocated at AR's Canton, Massachusetts base. AR, having already taken on Cello, are looking at moving into the high end, with plans to produce a line of reference quality products. We will have to wait until later this year to see the results.

AIWA AUDIOPHILE
AIWA have announced a budget amplifier with "audiophile intentions" (pretensions?). The £119.99 XA-003 bears a circuit based on a stripped down version of AIWA's more expensive designs, offering short circuit paths, direct source switching tone controls, five inputs and heavy duty speaker terminals.

MUSICAL FIDELITY BREEZE IN
This week's release from Musical Fidelity is set to cause a storm. A fax from their Wembley HQ blew into our offices, announcing the launch of the new Typhoon power amplifier, together with its matching preamp, called The Preamp. Not the Hurricane?

The Preamp, packaged in the style of the existing BI integrated, is a line level preamplifier. It sports six inputs, together with a tape monitor and switchable tape dubbing. It also features balanced output, coming supplied with two metres of cable, terminated with XLR plugs and sockets. Musical Fidelity's earlier 'The Preamp' helped to establish the M-F name, by virtue of its sound quality, combined with a very low cost. The new Preamp may follow in its namesake's footsteps; it costs just £199.

The 40 watt Typhoon power amplifier also has balanced inputs, together with four pairs of bi-polar transistors and a separate power supply for each channel. The bi-polar devices allow the Typhoon to deliver massive amounts of peak current for its price of £299.

VINYL FLOORED
More depressing figures for vinyl buyers from the British Phonographic Industry. Deliveries of long-playing black discs to the record retailing trade shrunk from 14% of the total for all formats (in the third quarter of 1990) down to 8% - a cut of nearly half - in the same period in 1991.

Whether it is because people are waiting for the launch of DCC, or they have fewer pounds in their pockets, we can't know, but sales of cassettes have also declined from a 54% slice of the cake to 46%, down by a fifth. CD now takes as much of the market as cassette, going on in leaps and bounds: up from 32% to 46%. The figures, rather than the percentages, make even worse reading. Two and a quarter million LPs sold in the third quarter of 1991 against thirteen and a half million cassettes and Compact Discs.

It's only in the singles market where vinyl doesn't seem to have the same death pallor, but even so, both twelve-inch and seven-inch singles have declined, cassette singles doubling and CD singles up by 7%. Singles were doing well, helped apparently by enormous sales for Bryan Adams' "Everything I do."

At whatever speed they revolve, recordings are still a money spinner; BPI Director of Research Peter Scapins reckons that when the figures are all collected for 1991 industry revenue will have gone over £700 million for the first time. Dare we say that we're not surprised? Seen the price of LPs, cassettes and CDs lately? All the same, we heard that pre-Christmas takings in record shops in the South East were down by as much as fifty per cent on previous years. Perhaps this is why W. H. Smith's Our Price chain announced they would no longer sell vinyl when current shop stocks have been sold, expected to be around the end of March.
ON SAFARI
In the April 1991 issue Alan Sircom says he always - when listening - wears cardboard elephant ears. My homemade ones are useless and won't stay on. Where did he get his please?
Major J.E.M. Ruffer, Middlesborough, Cleveland

There is a very good joke shop in Bristol, which supplied the said ears, along with several other pairs, to tide me over the 1991 Bristol Hi-Fi Show. After all, with such a diversity of products on display at Bristol, a second set of ears can come in handy. Expect to see more elephant ears at this year's Bristol Show. AS

IT'S BETTER - OR IS IT?
I would like to add my voice to the Vinyl vs. Compact Disc debate. My Rega Planar 2 is the first near-decent player I've ever had. Fitted with a Linn K5 cartridge it sounds as good as my Sony CD player. I don't think either sounds better - just different.

First of all, good recordings on CD aren't in fact as plentiful as I would like. A good example is Blowzabella's Vanilla; a bad example is David Bowie's Heroes. When I bought my Revox B225 CD player years ago, I was expecting to be amazed. I wasn't. Not at all. Mind you, I had an Akai System 7 at the time, but the first CD I bought was the aforementioned Heroes.

I think the CD format still needs work. I mean - look how long vinyl has been about; we are all used to the sound. It's what we expect to hear. The fine, pure sound of CD doesn't have the distortion that you can hear in a vinyl record, and you 'expect' to hear this distortion on CD, giving a feeling of something missing. In a few decades people will be more used to the sound and by then there will be better players.

W. S. Davis, Bristol

JAZZ IT UP
I enjoy reading your magazine, but feel that your lack of a Jazz/Fusion/Soul section is a glaring omission. If you could find your way to addressing this oversight you are assured of one more satisfied reader.

G. Goodyear, Bishop's Stortford, Herts.

Well, hand over the money! Jazz reviews became a regular last month; Soul and Fusion, of course, we review as space is available. EB

FOOLED BY FIGURES
About sixteen years ago I bought my first hi-fi system on the basis of distortion figures and power handling and so forth. It was all Japanese apart from the speakers, which emanated from Wharfedale. I took advice from those I thought knew best and convinced myself that if the figures said it was better, it must be better.

Five years ago some kind people dimmed in uninhibited and relocated it for me free of charge, so I approached my friendly insurers and asked them for some money to buy another one. Things having changed somewhat from former times; this time I was told to trust my ears alone and I plumped for a Linn Axiom, Arcam Alpha and Linn Index speakers based system. The Axiom was subsequently replaced by a second-hand LP12 with Basik Plus tonearm.

My current system plays music; my former did not. I also tried different decoders and supports and found they did make a difference. It's not so much when you put a better cable in your hearing area, but you realise something is missing when you take it out.

Do I trust my ears or shall I go back to trusting facts and figures?

I had hoped that these people had all retired into obscurity. They have forgotten something about human beings that is absolutely fundamental: reason and logic may be objective, but may be based on false premises. Art and our senses are subjective. Writing music may be objective, but interpreting it and listening to it is subjective. Merely playing all the notes in the right order does not make a good musician.

Neither does it make a great amplifier or system. My tastes and expectations are part of what I am. If those have prejudiced my view of the equipment I settled on, so be it. They suit my ears and that's fine by me. If we were all the same, what kind of world would it be? It certainly wouldn't be a Hi-Fi World.

A. R. Nicholls, Birmingham

Performance figures say more about competence of engineer- ing than about the sound. It always was - and still is - misleading to suggest that the measurements commonly made correlate well with sound quality. A few do; most don't.

At present, we still do not understand the mechanisms of human cognition, but research is beginning to suggest that it is highly complex, being crude in some areas but acute in others. We're to know how the ear/brain mechanism gathers information in the time domain and processes it, then we might better understand how to structure measurements that addressed the parameters that are subjectively important. We are nowhere near to this at present.

Until we reach a better understanding, the measure- ments we do make need careful interpretation. They are useful, I believe essential, but at present only a few can be related directly to perceived sound quality. In the meantime, there's no substitute to listening. NK

VALVE DECODER
Right. I've got my Leak Trough- line ( Mk II and mono). What I want to know now is when Tim de Paravicini is going to bring out his valve stereo decoders. And will I be able to get one for a tenner? Incidentally, how many valves will it actually take to carry out the task of decoding? When IC decoders were relatively new, I remember reading that for valves to perform the same function it would take a load of them.

Do you have any knowledge of the TDA1005 stereo decoder IC? I've just bought a surplus circuit board containing one. It's a sixteen-pin device as opposed to the fourteen pins of the MC1310P and there's a wick of presets in the circuit. I haven't built a power supply to try it yet. Do Naim use the standard MC1310P?

Despite being just mono, I use the Leak in place of an elderly Cambridge T55. The difference here is that both mono and the use of a specialised vocabulary and I recognise the difficulties which must arise in writing for an audience whose antipodes are let us say, myself on the one hand and sophisti- cates like yourself on the other. Now in the matter of wine, I was given last year a couple of bottles of '59 Chateau Latour and two of Chateau Haut Brion '59, which I drink after carefully decanting (you are not obliged to believe this but it is true). At circa £200 plus per bottle friends said I should sell 'em. These certainly were sumptuous wines and they are a notch up from the '85 Chateau Bara7uries (a cru bourgeois) at £450 a bottle in 1988, but £200 a bottle. It is as I have long suspected, a classic case of the King's new clothes: nobody can see/taste/hear it, and nobody wants to own up.

Mike Muse, Leicester

Finally, is there any chance that you might consider offering a "Sales and Wants" section in the back of your excellent magazine?

Stephen Furley, Stanley, Co. Durham

I spoke to Tim de Paravicini. The valve decoder is on the way - expect to see more details about it in a forthcoming issue. He says it will have no more than 12 tubes, probably double triodes, and that it will use sum and difference prin- ciples, rather than switching, as used in the Motorola MC1310P he mention. He also hopes to make it available built and in kit form. Nothing like this costs 'a tenner' these days, around £60 was thought likely for the kit and £100 for the built up version, which is good value. Tim also says he is likely to produce an extra RF stage to improve sensitivity, since at present the Troughline is incredibly insensitive, meaning it needs an unusually strong aerial signal of at least 5mV.

Linear data books are the best place for details on dedicated decoder ICs, or manufacturers' data sheets.

Both decoders you mention are available from companies like Crickl very Electronics (tel: 081 452 0161/450 0995) and Maplin Electronics (0702 552911), from whom we often get parts.

CHATEAU LATOUR
Thank you for your temperate response to my letter about subjectivity in the December issue of Hi-Fi World. I accept that people such as yourself have listened to a great deal more kit than I have and this is bound to make a difference. You may well have a better ear than I do: certainly one accepts this to be true of people such as profes- sional musicians. I understand your reference to wine tasting and the use of a specialised vocabulary and I recognise the difficulties which must arise in writing for an audience whose antipodes are let us say, myself on the one hand and sophisti- cates like yourself on the other. Now in the matter of wine, I was given last year a couple of bottles of '59 Chateau Latour and two of Chateau Haut Brion '59, which I drink after carefully decanting (you are not obliged to believe this but it is true). At circa £200 plus per bottle friends said I should sell 'em. These certainly were sumptuous wines and they are a notch up from the '85 Chateau Bara7uries (a cru bourgeois) at £450 a bottle in 1988, but £200 a bottle. It is as I have long suspected, a classic case of the King's new clothes: nobody can see/taste/hear it, and nobody wants to own up.
readers' reply

Send your letters to:
Hi-Fi World Letters
Page, 64 Castellain
Road, Maida Vale,
London W9 1EX.

HOT DOWN UNDER
Greetings from Down Under. I have just finished reading the November 1991 issue of Hi-Fi World, and must congratulate you for an excellent journal: anyway a good change from what I have been used to, but it takes so long to arrive!

With regard to your comparative test of the six integrated amplifiers, I think I have a comment or two to make for your reference. I use a Creek 414052 and had the opportunity to pit it against a Musical Fidelity Ai two years ago. It was a straight A/B test, driving a tweaked Goodmans Maxim 2/ subwoofer set-up. Both amplifiers exhibited individual approaches, but during the first part of the test the Ai was well trounced by the 414052. Sure it had loads of fidelity but was not at all Musical, lacking in the sort of toe-tapping "involvement" and "presence" of the Creek. It was, of course, due to the amplifier not being hot enough to reach its optimum operating condition; the owner has since adopted the policy of not switching his Ai off at all. It gave him a good place to keep his coffee warm.

Hi-Fi World, March 1992

Continued on page 77...
Feedback from Alan Sircom

Sircom’s circuits

change, which also affects the non-specialist music business, has potentially disturbing ramifications.

In the past, the major record buyers were usually teenagers, who would spend their pocket-money on buying singles and the occasional LP. Fifteen years on, many of these people have slowed down their buying from the fever pitch that often accompanies teenage fads. But they still buy music.

Today’s teenager appears to be faced with a different set of priorities. The singles market has effectively died, buried by rising prices and album milking; it was far cheaper to buy Michael Jackson’s ‘Thriller’ album than it was to buy all the single releases from it. That with market’s death, the buying public have had to become more canny. Safe recording stars such as New Kids On The Block, (MC) Hammer and the PWL/Kylie/Dannii/Jason/Scouse team provides mainstream pop that will sell consistently, because of their ‘formula’ sound; you like one PWL record, you will like almost all of them.

Ten years ago, no self-respecting thirteen year old would admit to liking old groups like Free or T-Rex, let alone Sixties music. Rehash these records, together with attractive people squeezying into denim, chewing gum or opening bank accounts, and we have a successful hit. These commer-cials, designed to appeal to the twenty-to-thirty-somethings with disposable income, have had a knock-on effect in the music business, making the advertising spin-off a healthy and lucrative business.

Why is this a problem? Unfortunately, when the buying public only wants mainstream music, or safe hits from the past, it allows no room for an alternative music to evolve. A lot of the ‘classic’ music, used in commercials, was anything but mainstream at the time it was released. Some - such as the Rolling Stones’ ‘Gimme Shelter’, or anything by The Clash or The Doors - was considered almost subversive compared to the perfect pop records of the day. Why didn’t they use Gilbert O’Sullivan’s ‘Alone Again, Naturally’ for a Levi’s ad, instead of T-Rex’s ‘20th Century Boy’? Or Joe Dolce’s ‘Shaddup Your Face’ instead of The Clash’s ‘Should I Stay Or Should I Go’?

With such plastic pop music dominating the charts, and the ever-rising cost of buying an album, it is little wonder that the teenager with money to burn now heads for the computer game shop to buy the latest cartridge for his or her Nintendo Game Boy. As these cost about the same as a CD, are nowhere near as noisy as playing ‘music full blast during Eastenders and keep said child occupied on car journeys, parents seem more than happy to provide cash for the Game Boy cartridge, while asking the question “Do you really need that Guns ‘N’ Roses CD?” at the music store.

Thus, the teenage music buyer appears to spend less on his or her music, preferring to have more Game Boy cartridges instead. When they do buy albums, no teenager is going to want to own an old-fashioned record player, when they can get their parents to buy them a ghetto blaster complete with CD for £99, in a colour that matches their £200 Nike Air shoes. The true music enthusiast, unenconcerned with Nintendo or the colour of their equipment, faces a different problem.

One of the vinyl junky’s greatest misgivings of recent years has been the poor quality of today’s pressings. I strongly believe that if the vinyl LP went upmarket, with better pressings and tight quality control, similar to the Decca days, then music lovers and audiophiles would be prepared to pay the difference. After all, today there are only three types of people still buying vinyl albums: those who buy one record a decade, those who cannot change CD player or a tape recorder and those who refuse to buy CDs because they have a good record player. This last group would accept this price increase if the quality could be maintained.

The LP is refusing to lie down and die. Both CBS Sony Music Entertainment and MCA are rumoured to have had to reopen vinyl pressing plants in the U.S. in the wake of public pressure. The BPI suggest that LP sales are down to a mere eight percent, but this is at a time when many music stores only stock the most perfunctory vinyl collection. If there was an eight percent downturn of total music sales in the UK, the main players would be distinctly concerned.

I can see the LP becoming a cause, in a similar fashion to the beer industry in the late 1960’s and early 1970’s. Traditional brewing techniques were being superseded by methods which allowed beer to be stored and served with ease, as well as making the cost of production far lower. This threatened to put the small brewers out of business. Enter CAMRA, the Campaign for Real Ale, a small pressure group, determined to cause a turnaround and re-establish the better tasting ‘real’ beer into pubs up and down the land.

Several years later, helped no doubt by the Mony Python team’s attack on ‘Bleedin’ Watneys Red Barrel’, CAMRA succeeded, causing the fizzy chemical beer to take an eventual third place, behind real ale and lager, as the British national pastime.

Analogue Addicts are such a pressure group. I’m sure that over the next few years, with more and more people becoming dissatisfied at the lack of choice in the music store, such pressure groups will gain momentum, causing the LP record to maintain its position as the analogue champion in a digital world. The turntable is every bit the analogue champion in a digital world. The turntable is every bit
The nutty side of hi-fi is the fun bit, and I'm sure Tim de Paravicini won't mind if I say that 99% of his projects and ideas have us rolling around the office laughing. Better still - he's deadly serious! Only Tim would insist that the Leak Troughline should be fitted with a valve stereo decoder, and only Tim has the knowledge, will and sheer determination to actually build one.

It will join his fabulous but rare EAR valve amplifiers, valve microphones, valve cutting lathes, valve tape recorders and, dare I even mention it, an even bigger collection of solid-state equipment.

For Tim takes the strictly engineering view that if it does the job well in objective terms, then it does the job well. It's just that where normal mortals would recoil, Tim sees no problem.

That's why he's designed a preamplifier with no fewer than fifty-two valves in it, a valve amplifier that produces an easy 250 watts (EAR 549) and cutting lathes that carry out various functions, including intermediate frequency extraction, demodulation from a radio signal into an audio signal and decoding, where the mono signal and stereo information are transformed into stereo and is not 'seen' or suffered by the hi-fi designer.

If it was, then matters wouldn't have reached this state. It is the large semiconductor companies that make dedicated silicon chips (integrated circuits), such as Motorola and Philips.

They carry out all the really difficult design work, doubtless in very advanced laboratories. It saves so much time and trouble to use the resulting chips, they have been pressed into service by everyone, with predictable results: modern tuners sound much the same.

In case you are interested, the same chips are available over the counter to the public from any electronics store with a good stock of semiconductors. For example, Cricklewood Electronics (081-452-0161) can supply a stereo decoder for around £12.

Please don't think this sort of thing is ideal for rainy weekends; you need a fair bit of knowledge to get it working well, although manufacturers' application sheets are generally very helpful and speed things along.

I haven't a clue as to how Tim will make a stereo decoder with just four double triode valves ("I'll use the sum and difference principle," he confidently tells me). We thought it would be an interesting project to take a good look at the things and look like something from the Quatermass Experiment. But it does sound like a nice idea.

We're all laying bets on the announcement from Huntington (Tim territory) of an all-valve Bitstream decoder. That'll have us rolling around the office all week.

Reflections from Noel Keywood

**Kaleidoscope**
Only the very best loudspeakers can deliver the full width of the audio spectrum. Most of the lesser models fail, not in the bass, but in the vital high frequency area around and above 20,000 cycles, which is so essential in providing the stereo imagery needed to re-create the sense of 'being there'. Wharfedale's all new 25mm ceramic dome tweeter takes you 'there' effortlessly, offering perfect piston behaviour beyond 40KHz for super sweet treble performance.

And for once this brand new, high-flying technology doesn't cost the earth – the 'C'-class precision 515 can be making your system hit the highspots for less than £260 per pair.
When I was at college, a friend of mine owned a Michell GyroDec. What a wonderful, extravagant flourish of design these machines represent. Although it has a conventional platter, the record appears to be supported on top of half-a-dozen whirling weights. The eye can hardly fail to be enchanted by gyrating chrome whilst the ears are delighted by the music from the record.

As if this display was not enough, my friend's listening was preceded by a precisely observed ritual because he had discovered hi-fi during the period when playing records was in vogue. Once a record has been played wet, due to the wet dust-sludge forming a kind of emery paper in the groove when dry, the record must always afterwards be played wet unless it is very carefully cleaned. My friend, unable to afford having all his records cleaned, continued to play them wet.

So, before an LP was played, a few drops of distilled water were dropped from a pipette onto the surface. Due to the rotation of the record, they formed a neat spiral of menisci and a modified "DustBug" brush swept the surface of the discs breaking up the little droplets of water to form a surface film.

It was as fascinating and intricate a ritual as a Japanese tea ceremony. He owned the best hi-fi that I had heard but there was more to it than that. The method and protocol, the pageant of the extravagant and hypnotic design of the record deck, all added to the occasion and - where music is concerned - occasion is the key word.

"Some 300 years ago," wrote Arthur Jacobs at the end of his A Short History of Western Music, "music was composed for the specific musical occasion; now the musical occasion is ubiquitous, wherever there is a record player or jukebox... It is a situation of both peril and promise." The peril seems more acute today than they have ever been before.

One is due to digital audio's very indestructibility. This was brought home to me recently when I overheard a comment two friends talking in Our Price and one turned to the other and said, "The great thing about CD is, because they don't wear out, you don't feel guilty if you leave the room when they're playing." Is it good for music - good for us - that we own hours of untaintable, immutable music? Does it not encourage us to not bother to listen to it properly? In the old good days of records, the sound - in a sadly literal sense - was torn from the groove. As you played them, they wore out, but far from detracting from my listening pleasure, I believe in a curious, subconscious way it may have enhanced it. It made listening an occasion.

Another peril is the result of the characteristic complexity of digital audio. People have "lost connection" with the designers. Writing before the dawn of CD, Evan Eisenburg, the music columnist of the American magazine, The Nation wrote about the special nature of music on records: "Instruments which are bitches to play, from which drawing a single clean note is like pulling a tooth, afford the keenest joy of all when played well; every note of the oboe, violin and French Horn seems to recall the ordeal of its production and rejoice in its escape. When such hard-won beauty runs the further obstacle course of vinyl and diamond and reaches our ears in one piece, our delight is that much greater."

Eisenburg argued that because, like a musician, a record player wrings beauty from an uncooperative medium, "the art of phonography is music multiplied by itself." Music produced from arcane, drab digital integrated circuits can never tangibly reveal the "ordeal of its production". Clever digital audio may be, but the artifice is beyond drawing-room comprehension. Consequently, the digital age has deprived us of the age of whimsy and of delightful design for its own sake.

It's a depressing characteristic of the new digital age that it will ultimately deprive hi-fi buffs of the domestic listening occasion as we knew it, the special hi-fi pageant. An occasion that was, in its way, as special as going to a concert. And yet I am optimistic.

Recorded music, though it pales in comparison with computers, antibiotics and atomic energy, is one of the Wonders of the Twentieth Century. It touches most people's lives everyday and probably for the better. In Arthur Jacobs' 'terms, the promise of recorded music in our century has far outweighed the peril and I believe it will continue to do so. Eighty years ago musicians feared recorded music would drive people from the concert halls. It didn't. Maybe because it wasn't good enough - but I doubt it. It's because music is about communication. And not in the dry engineering sense - people communication. Whether it's Hendrix, Du Pre, Lennon or Glenn Gould at one end of the recording chain, if we're moved to anger, laughter or sadness at the other; more has travelled in the wires and semiconductor junctions and is contained in the grooves or CD bits than just signals; as much as a great work of literature is more than a pint of ink on a few hundred sheets of paper. But the comparison with a work of

recorded message

Left by Richard Brice
It's the name I love the most. I only wish the Kremlin tuner had had a few domes at either end and a red Linn emblem placed somewhere in the centre. The architectural lines of Musical Fidelity's Odysseus valve amplifier would have served as a suitable example. Then I could have looked at this tuner as a reminder of a vast social endeavour that lost its way and eventually collapsed, as well as a delightful play on words, of course.

As our pictures should show, the Kremlin in fact makes no stylistic allusions to any building of State. Sadly, it is little more than a black box, cast in the mould of Linn electronic products in general, which I find are pretty self-effacing in appearance. That's not to say they are anything other than well built and finished. But with such imaginative names, I would love to have seen some equally imaginative styling.

The Kremlin is Linn's first tuner - and an expensive one too. It costs £1,645. Their approach to the problem of producing a world class VHF/FM tuner is the same bold one adopted by Naim; that is, to design and build most of the circuitry in-house for control over its execution.

Whilst the promise of this approach is great, the difficulties and dangers are greater. It is not for no reason that most manufacturers now buy in basic tuner building blocks, available from numerous specialist suppliers. These are bolted together to get a final product that, these days, should - and usually does - have an excellent basic performance. The DIY approach demands deep theoretical and practical knowledge in a notoriously difficult area of electronics, plus access to equivalently advanced and, therefore, expensive test equipment. Linn have taken years to develop this product - and it hardly surprises me. Perhaps spurred by the competitive example of Naim, the only other company I know who insist on building even the front end themselves (and who also have RF test equipment of a class that makes my eyes light up) Linn have taken a similar high road. The Kremlin is a VHF/FM only tuner that operates by remote control and is meant to deliver the highest possible level of sound quality. Unlike the Naim tuners though, this one is a synthesiser type with no fewer than eighty presets.

I was a bit surprised to learn there are no user selectable options designed to simplify (as it were) the circuitry, should it not need to be complicated. Linn do not include switched RF (radio frequency) gain, to remove a gain stage, when the aerial is supplying a strong signal. Nor do they offer selectable IF (intermediate frequency) bandwidth. These facilities offer users a choice of best RF performance or best sound quality, according to reception conditions and personal requirements. They are a way of offering effective results under difficult conditions, such as when working from a poor aerial in the middle of an RF infested city, or under good conditions, like living on the Isle of Wight with Rowridge chucking out 250kW just a few miles away. Whilst for high quality sound, tuners must be fed a strong, clean signal from a good aerial, I am still surprised that at the price owners don't have some options on the

Kremlin misses its marx

Linn's new Kremlin tuner just falls short of the mark. Noel Keywood finds limitations in a new tuner aimed at the top of the market.
performance at their disposal.

The ergonomics of the Kremlin were flawed in places. The single, green digital display shows frequency or memory number, but not both consecutively. When manually scanning the presets, listening to stations, only the preset number is shown, not the station frequency, nor any way of identifying the station; to get frequency, the Tune button must be pressed. Although this action is meant to make manual tuning available, it also switches the display to show frequency. To return to preset scanning, the Preset button has to be pressed to reactivate this mode. So to get a station frequency readout when going through the memories, the tuner has to be constantly switched between Preset and Tune, something I found more than a little inconvenient. With eighty available presets, this is where RDS (Radio Data System) would have been a boon, giving a read-out of the station name as well.

The Kremlin tunes very slowly in manual mode, moving in fine steps of 10kHz. These give very fine tuning resolution and potentially allow a high degree of tune accuracy to be obtained. However, whilst the on-tune indicator, which changes its intensity, does show differences between individual steps, it does not necessarily glow brightest at the precise station frequency. I transmitted at precisely 90MHz; it showed 90.01 MHz as the best tune point. Similarly, optimum tune for Radio 3 appeared to be 91.31 MHz, when it should have been 91.30 MHz. This is purely a matter of inaccuracy of the tune indicator; when tuning automatically in Scan mode the Kremlin hit the exact station frequency every time and it gave its best measured performance rather than by the tune indicator. I suspect owners might be perplexed by this ambiguity, all the same; I certainly was.

A convenience known as Autostore is provided, where the tuner scans and stores stations as it finds them. The noise muting and detection threshold is set to 25dB but can be varied from 3dB to 80dB to match reception conditions. There is an optional Mono button, but automatic channel blending up to full mono is provided, keeping noise down even on weak transmissions.

I was pleased to see that Linn have, like Hitachi and Sony, fitted a digital readout signal strength meter. These things have massive range and resolution. Linn’s runs from 0dB (1µV) up to 120dB (1V) in 1dB steps, clearly showing what strength of signal is reaching the tuner from the aerial and, therefore, whether enough signal is available for best results (see Measured Performance section).

The display automatically switches off after a short time, but there are various user programmable functions and...
Keeping the display on is one of them. The tuner will work under external control in a multi-room system and it will also switch between two aerial inputs, so cable as well as terrestrial transmissions can be received. The station memories store aerial input and all station settings, so station changing can be made to automatically swap aerials too.

The Kremlin was easy enough to use from the remote control and completely free of operating quirks.

**Sound Quality**

The Kremlin was pitched into a sea of tuners for the purposes of comparison. It served as a yardstick against which the five budget tuners could be compared, as did the Kenwood KT-7020 and our own Leak Troughline. As always, the problem with using tuners as 'references' in this fashion is that no absolute standard can be established. The 'nicest' sound could be down to personal preference or even an ability to gloss over transmission faults.

To assess the Kremlin more critically, in terms of its ability to reproduce a programme, I also transmitted a stereo signal, using a Denon DCD-2560 Compact Disc player connected to one of our VHFRFM signal generators. Although the signal chain is long and complex, it is still lucid enough to reveal the quality of the CD player. This shows just how revealing of basic programme quality a good tuner can be these days.

The area in which the Kremlin proved strongest was its ability to differentiate and generally reproduce high frequency information clearly. Tuners commonly have a peculiar colouration in this area; they soften transients and generally smother high frequency information, making for what is best described as a lacklustre sound devoid of real clarity and liveliness. The Kremlin sounded relatively clear across the upper mid-range and treble regions, at least, when compared to run-of-the-mill tuners. The extra clarity and improved transient reproduction produces better definition of singers and instruments, giving them a harder edged outline. It makes for a more solid and dimensioned presentation.

In contrast to the Kenwood KT-7020, the Kremlin sounded better balanced tonally, for it lacked the brightness of the Kenwood. It had more body as well, giving greater weight to singers. Where this tuner displayed no advantage was in freedom from mud and strength of bass. In every respect, the Kremlin served as a yardstick against which the Kremlin was easy enough to use. Listening to the New Year's Day concert from the Vienna Philharmonic on these two tuners showed that the Kremlin displayed considerably more delicacy and insight into the performance. Violins sounded superbly natural and clear on the Leak; they were delicate and airy. Bells rang out with sweetness and sonority; there was a good sense of space around the groups of instruments.

In contrast to this tuner, if not to run-of-the-mill designs, the Kremlin both proved strongest was its ability to measured performance

High standards of performance from modern tuners makes the task of designing a unit of clearly superior performance very difficult. Linn have carefully secured a good RF engineer and have invested in appropriately advanced (and expensive) test equipment to produce the Kremlin. It uses their own front-end and IF strip, with ceramic filters being avoided due to input imperance variation and resultant non-linearity, Linn told me. A phase locked loop detector was designed in-house too, with low noise and distortion claimed, something borne out by measurement. On the test bench it was surprisingly stable and 'normal' in its behaviour. Subsequent use showed that it worked normally in use, in every respect. There was one small chip or square to speak of this: a substantially new design, from aerial input to audio output. Rather than use the usual 'constant k, M derived off-the-shelf filter that puts notches at 1.9kHz and 38kHz to suppress pilot tone and sub-carrier, Linn have designed their own seventh order low pass filter. As they correctly point out, this better suppresses all the unwanted signals that exist above 20kHz, many being due to inter-modulation. The draw back is simplicity complexity; a lot of active stages are needed for a seventh order filter, usually built around integrated circuits. However, is this a good idea to open to question; many would think there is more to be lost than gained.

Filter performance and termination affects frequency response. The accuracy of Linn's filter can be judged from the response plot, the Kremlin has a flat frequency response from 60Hz to 15kHz (-1dB). A roll off exists at low frequencies, something Linn were quick to defend on the grounds of 'improved sound quality', even though no reason was given as to why this should be so. It was an implausible suggestion, I felt, if not an uncommon one. However, the flatness of the basic response should and did produce a good sense of correct basic tonal balance, with neither high nor low frequencies being emphasised.

**Separation**

Channel separation on stereo was extremely high, hitting -66dB in the mid-band - the best figures I have ever recorded. Performance at high frequencies was little worse, at -43dB. Because the crosstalk signal in a stereo VHFRFM transmission is usually heavily distorted low crosstalk (due to high channel separation) effectively reduces distortion, so the high channel separation of the Kremlin hones in well in unexpected areas.

Linn's own phase locked loop discriminator produces little distortion. I measured 0.18% of second harmonic (seen in the analysis) on left and right channel signals, and 0.12% on a centre (mono) input signal, at 50% modulation. These are low values, but not as low as that of the best Japanese tuners, as comparison with the budget Pioneer FT-229L in our group report will show. The differences are minor though, made even less important by the fact that the distortion residual is predominately second harmonic only. It is an especially benign sounding form of distortion that, in large quantities, alters timbre; it does not produce any nasty gritty or grating sounds.

The greatest benefit Linn have reaped from designing and building their own circuits is the immense lack of hiss at full quieting. Before eagle eyed readers write in to remind me, Kenwood's KT-7020 reviewed in our February 1992 issue managed to remind me, Kenwood's KT-7020 reviewed in our February 1992 issue managed to out with sweetness and sonority; there was a good sense of space around the groups of instruments.

The Kremlin was easily the most popular tuner I came across, but it was not in the same league as the Kremlin. The Kremlin was gained at the expense of power in bass fundamentals. Swopping from the Denon to the Kremlin whilst listening to Dylan singing 'I want you' showed that notes of the simple bass line backing were being placed precisely, but they had little resonance or power.

**Quieting**

The full quieting threshold of 2mV is high, demanding use of a good aerial capable of supplying a strong signal. You have to bear in mind here that if 2mV is to be a minimum signal from the major stations, then around 5mV might be the average and 7mV the maximum. The relative strength of the individual stations depends upon the tuning and the aerial, and its location. With such low noise, some degradation will be barely noticeable. With just 1mV from the aerial, hiss measured -74dB, which is still compressed and thickened the performance, making for a less natural and plausible presentation. The orchestra was re-assembled into a flatter perspective, with weakened contrasts. Strings sounded heavy, indelicate and a bit blurred. I could less well discern the presence of individual instruments and there was little sense of real space around the orchestra.

Later, with a recital of Schubert's 'Far from the great city' I changed from the Leak to the Kremlin again. The beautiful resonance of the violin's body and the rich but delicate sound of its strings were quite noticeably suppressed or erased. I found the Kremlin. In summary, it made the violin sound dull, indelicate and leaden. This comparison actually embarrassed the Kremlin, I felt. Whilst it is better than budget and run-of-the-mill tuners, it does not show an unequivocal advantage over designs like the Kenwood and it is not in the same league as a Leak or Denon.

Working off-air I was generally happy about the dry bass of the Kremlin. Aware of its early bass roll-off though, I compared it with the other tuners and found that a form of bass lightness could be heard. The Denon TU-260L has fulsome bass and against that it was quite clear that the lean control of the Kremlin was gained at the expense of power in bass fundamentals. Swopping from the Denon to the Kremlin whilst listening to Dylan singing "I want you" showed that notes of the simple bass line backing were being placed precisely, but they had little resonance or power.
So it was with U2's 'God's country', the backing bass line became a little less prominent, if anything, the transmitted low frequency content from FM radio often seems weak; making it weaker is not desirable.

Even though a tuner like this should not be used with an unsatisfactory aerial, I worked it from an indoor dipole to check RF performance. It picked up weak stations very well and didn't ever get fiercely noisy on stereo, due to automatic channel blending. This made it seem more civilised and capable than usual.

CONCLUSION

There's no doubt that the Kremlin is a fine tuner in every respect. However, it doesn't scale the heights in terms of sound quality and my suspicion is that no tuner is likely to do so when configured for an advanced RF performance, too many gain and signal processing stages have to be used. In other words, the Kremlin is too good for its own good. It attempts to be all things to all men and probably gets as close as possible with the compromises necessary. Since the tuner measures all but perfectly in its audio performance, that compromises exist is open to the usual subjective/objective argument though. From the example set by the simpler Naim tuners and our own very simple Leak Troughline, better sound quality is possible - and from a simpler tuner. Ultimately, whilst I have to admire the engineering in the Kremlin, it is very expensive for the results offered.

PERSONALNOTE

Personally, I hope Linn build on their knowledge to offer a simpler, less expensive version in the future.

The question everybody here asked was: how does the Kremlin compare to the Naim 01 tuner? We couldn't resist making this comparison, since the Naim is also a highly specialised design known for excellent sound quality. You can read the outcome of our comparison on page 63.
BIRDS OF A FEATHER TAKE TO THE AIR

Deregulation of Britain's airwaves has brought more stations into operation and increased choice, without producing the anarchy that conservative voices thought would prevail. Some of the new stations we can get are laughably amateurish and their technical quality abominable, but they do provide some choice and their metier is often wildly different - like a ten minute Reggae track from a station that gives no name announcements - Wow!

Whether you'd like to tap into pirates like this or the major stations - new and old - the tuners here will do a good job at very low cost. They can pick up weak stations, separate them from strong ones nearby and then convey inherent broadcast quality well. I know this because part of our test routine was to transmit 'in-house' from our own stereo generator; we got a mediocre sound until a decent CD player was used. That's how good budget tuners are nowadays.

The considerable complexity of VHF/FM radio has been overcome through the development of dedicated integrated circuits (aka silicon chips) of high quality. This has the unfortunate effect of making differences cosmetic, at this price level anyway, but at least the uniformity is one of goodness. But what do you need to consider when getting a tuner?
Apart from Radio 4 on long wave, entertainment comes from the medium wave and VHF/FM bands. Only the latter provides high quality stereo sound; it is immeasurably better than AM broadcasts on medium and long wave. The trouble with VHF/FM is that it doesn't travel well, being obstructed and deflected by hills and buildings. Lots of transmitters are needed, but in Britain we've got them. Since well over 90% of the population can receive VHF/FM, we are told, this is the band that is of most interest. Pirates and licensed commercial stations are mostly on VHF/FM as well, so there is more choice to be had. Only Radio 5 and the World Service are exclusive to medium wave.

An intractable problem with VHF/FM, if high quality is to be achieved, is the need for a good aerial. Without it, hiss, distortion and crackling can become quite severe. Except for those within a few miles of a transmitter, this means a loft or an outdoor aerial. Normal indoor aerials are generally inadequate, which rather condemns all those poor souls in blocks of flats. And there's no easy solution to this, since even the world's best tuners don't have greater sensitivity or a lower quieting threshold than the five budget models here. Believe it or not, that's why I said earlier they are uniformly 'good'. In truth, they're almost embarrassingly good.

Pulling in stations on VHF/FM, or weak ones at least, means getting the right aerial. All the major BBC and commercial (IBA) stations should come in well enough with a simple indoor dipole, albeit with hiss and mediocre audio quality. Real hi-fi comes from no VHF/FM tuner - not even the best until a strong aerial signal is provided, which means an outdoor aerial is usually essential. That rule applies to these tuners as much as expensive ones.

All five tuners are synthesiser types with push-button station selection. They tune in discrete steps and can hit stations very accurately. They also possess very high frequency stability, so drifting off tune is not a problem. This is unlike continuously or mechanically tuned push-button tuners with AFC (Automatic Frequency Control), which drift, suffer tune-error distortion and will jump to strong stations in preference to weak ones, under its influence. Synthesiser tuners don't suffer such problems and these days they possess at least twenty station selector buttons.

Budget tuners forsake facilities for low price. All lack a signal strength meter, switchable IF bandwidth and RF gain. Slightly better sound quality can be had with the latter options, but again only when a strong, clean signal is available from the aerial. Otherwise such facilities are wasted. The tuners here, although inexpensive, represent a sensible upper quality limit for most people - and a high limit it is too.

**Comparison review**

**PIONEER F-229L £99.95**
**SANSUI TU-X111L £99.95**
**TEAC T-X3000 £99.00**

**JVC FX-335L £104.99**
**DENON TU-260L £109.99**
DENON TU-260L

Although little separates these tuners in visual style, the Denon in my estimation is by a small margin the most attractive. The lettering used to distinguish the various buttons is large enough to be legible, but not so large as to be ugly. Minor stylistic details, like a row of push buttons for station selection blending in to be part of a full width ridge running across the fascia, help the TU-260L appear more fluent and cohesive in its style, and less of an ad-hoc collection of functional bits arranged purely by an arrangement of simple symmetries.

Little more than appearance and finish distinguishes this tuner, however; it offers much the same list of functions and facilities as the others. It is a synthesiser tuner with push-button station selection and twenty memories, addressable through ten buttons with an A/B option on each. Three wavebands are provided: VHF/FM, medium wave and long wave. A station on any band can be allocated freely to any memory, although some may find it easier if, for example, VHF stations are put into option 'A' and AM into 'B'.

The Denon will tune automatically or manually, using the normal 50kHz steps on FM and 9kHz steps on AM. The auto/manual button also selects Mono and cuts out noise muting, but strangely the handbook makes no mention of this. In fact, it offers no user guidance at all, operating instructions being only a numbered sequence attached to a diagram. A clear, light blue, fluorescent display shows station frequency, waveband, mono/stereo and selection of A or B option on the station buttons.

The rear panel has a co-axial 75ohm panel mounted plug, so an adaptor is needed for the usual UK coaxial line plug. Denon supply a multi-purpose balun plug however, plus an AM loop aerial.

SOUND QUALITY

The slight downward response droop of the Denon's VHF/FM section coloured its sound by a small but noticeable degree. I would describe it as warm and full bodied, the warmth - and a sense of smoothness - coming primarily from the gently suppressed treble. Fed a strong aerial signal, the TU-260L was hiss free on Radio 3 and offered a fulsome and ambient portrayal of a Respighi choral work, with choir and soloists well differentiated. I noticed some slight merging of strings and a little less apparent insight than the Pioneer, for example, but the Denon did convey both scale and atmosphere well - an area some of the tuners censored.

I continually had moments of doubt about the warmth, especially when Sarah Locket reading the news on GLR sounded chesty and almost guttural. Swopping to the Pioneer had her squeaking and lisping like a rabbit - all teeth and enunciation, but without resonance. This was a curious comparison; both tuners were quite obviously flawed; neither was right.

It was Queen's Bohemian Rhapsody on Capital that showed the TU-260L has large and rounded bass, with quite good speed and articulation, but with a bloom that suggests emphasis. However, it imbued this tuner with a sense of weight and fullness to the sound that in general slightly enhanced both Rock and Classical programmes, if not Sarah Locket. Some of the tuners sounded mean and constructed - but not the Denon. Transmissions from our stereo generator confirmed the fact that the Denon had more warmth and body to its sound than the other tuners, but it did not sound overtly dull.

Performance on VHF/FM, when fed a weak signal from our optional indoor dipole, was relatively good. Radio 3 wasn't overwhemed by hiss, but Radio 1 at the other end of the band was seriously noisy and distorted; it was with the other tuners though.

Reproduction on medium and long wave (AM) was very good, with plenty of bass and quite reasonable treble. Sensitivity was high with the frame aerial supplied; for example French stations came in cleanly on Long Wave whereas they crackled badly on other models. Denon haven't ducked the issue of performance in this area.

MEASURED PERFORMANCE

Denon fit an effective pilot tone filter to the TU-260L; it reduces it at 19kHz and sub-carrier at 38kHz very well, which ensures Dolby action is not impaired when recording. However, termination of the filter looks a bit suspect, causing some droop in the upper mid-range around 8kHz and a small peak above this frequency - traits shown in the response analysis. The droop will be more audible than the peak, producing some slight warmth to the sound.

Although there is a trade off between selectivity and both channel separation and distortion, Denon manage to get all three in good balance on this tuner. It is highly selective, being well able to reject a strong station whilst receiving a weak one close by.

In spite of this, distortion was low on various stereo signals, the average result being just 0.1%; the domain of expensive tuners only a few years ago. The analysis shows that small amounts of second and third harmonic existed, which are unlikely to cause much offence.

Channel separation on stereo was pretty good as well, especially at high frequencies; this TU-260L maintained constant separation right across the audio band. It is common for separation to deteriorate at high frequencies.

This tuner is very sensitive. It needs just 0.4mV to reach full quiescence, the point at which hiss reaches a minimum. Even quite modest aerials can provide this level of signal. At times when signal or more, the TU-260L has a hiss level -71dB down. This is a lowish figure; just a very slight hiss would be audible on a quiet Radio 3 broadcast for example (tape with Dolby C/normal -76dB).

The TU-260L has a very good all-round measured performance, free of blemishes.

<table>
<thead>
<tr>
<th>FREQUENCY RESPONSE</th>
<th>DISTORTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency response (-1dB) 20Hz -16kHz</td>
<td>50kHz 1%</td>
</tr>
<tr>
<td>Signal for minimum hiss 0.4mV</td>
<td>Test - Distortion Harmonics 7kHz</td>
</tr>
<tr>
<td>Sensitivity mono 1.8µV</td>
<td>TONE 1kHz</td>
</tr>
<tr>
<td>stereo 16µV</td>
<td>Very low distortion of 0.1%</td>
</tr>
<tr>
<td>Selectivity alternate channel -80dB</td>
<td></td>
</tr>
</tbody>
</table>

The TU-260L has a very good all-round measured performance, free of blemishes.
The VHF/FM section has a small amount of flatness of the JVC were sufficiently narrow extremes of the audio band, visible in the frequency coverage to be difficult to identify in terms of their impact upon sound quality, but they may tinge the JVC's sound.

Upper frequency response extension was to 14kHz, a figure lower than that of other tuners, but not by any great degree. It was caused by an effective pilot tone filter that suppressed the 19kHz pilot to a low level of -65dB and sub-carrier to -80dB. This was another tuner with low levels of spurious output, an improvement upon the norm of a few years ago when little filtering was common.

With a signal of 0.6mV or more from the aerial the FX-335L reached full quieting, a condition of minimum hiss. This is quite a low value, showing good basic sensitivity is provided. Alongside the Sansui TU-X111 L, the JVC showed no obvious disadvantage, even though measurement shows it needs fractionally more signal. Hiss level behind Radio 3 on our indoor dipole was similar to that of the Sansui and Denon in fact.

In spite of being selective, this tuner offers low distortion and wide channel separation on stereo. There is a trade off here, but JVC have balanced the factors against each other well. The distortion analysis shows a small amount of third harmonic was produced, which lightens timbre.

In all areas the JVC FX-335L measured well, but it does have small response deviations that may slightly colour its sound.

Frequency response (-1dB) 18Hz -14kHz
Stereo separation -40dB
Distortion (50% mod.) 0.1%
Hiss (CCIR) -72dB
Signal for minimum hiss 0.63mV
Sensitivity
mono 2µV
stereo 25µV
Selectivity alternate channel -82dB
Signal strength meter none

**FREQUENCY RESPONSE**

![Frequency Response Graph]

Slight upper mid-range emphasis.

**DISTORTION**

1%

![Distortion Graph]

A little third harmonic distortion (0.1%)

### JVC FX-335L

JVC have found a new bright gunmetal finish for their audio products, one that is less gaudy than 'champagne' but a pleasant change from obligatory black. They retain the attractive orange fluorescent display panel with contrasting red legends, however, first used some time ago and now a part of their 'house style'.

JVC fit the FX-335L with VHF/FM, medium wave and long wave bands, the last being made available in the UK only, it would appear from the handbook. It is a synthesiser tuner, meaning it steps up and down the wavebands at discrete intervals of 50kHz on VHF/FM, 9kHz on medium wave and 1kHz on long wave. JVC offer the option of no fewer than forty preset stations, grouped in multiples of ten, as usual. The ten-button pad on the fascia is supplemented by a +10 group selector which, pressed three times before the 9 button, selects preset 39. This must be more than enough, even for the most ardent radio enthusiasts - so many in fact that JVC provide an automatic scan facility that alights on each station for four seconds to give users a quick listen.

Tuning is manual or automatic, as is memorisation of the stations using automatic memory. The usual protocol of manual tuning opening the noise muting and selecting mono-only is employed. Having found a station the tuner can be switched to stereo. Alternatively, auto-tuning is accompanied by noise muting and stereo operation. It's a sensible system that works well in practice, which is why most tuners now use it. The JVC usefully possesses red 'Stereo' and 'Tuned' legends that more clearly inform a user than an indicator LED against an unlit legend. Generally, I found this tuner easy enough to use and its display panel is very clear.

The rear panel accepts only bared cables (75ohm coaxial, 300ohm ribbon and AM loop), having no co-axial socket for 75 ohm cables, which was a pity.

### SOUND QUALITY

The JVC gave a generally warm and slightly 'enclosed' sounding presentation, albeit with a trifle more insight than some of the tuners. It managed well with Radio 3, various choral works around the Christmas period being presented with a degree of civility and naturalness that was easy to accept. I didn't find myself questioning the truth of its presentation: soloists took a strong role against the background of the choir and the contribution of individual choristers could often be quite plainly heard. There was a fair degree of insight and reasonable depth perspectives too. There was no sign of hiss or interference.

Andy Kershaw's 'Pick of the Year' (we're talking about 1991 here) on Radio 1, placed at 98.8MHz in our part of the world, sounded beautifully clean and clear after the fairly awful sound of Capital, from which I had fled in disgust after a few minutes of listening to what sounded like a compilation tape of hits. All six tuners had the ability to reveal broadcast quality, the JVC included. Swopping around between the JVC, Sansui, Linn Kremlin and Kenwood 7020 showed the '335 offered a sound with good basic tonal balance, reasonably well defined images, a good sense of insight and solid enough bass. It really doesn't get much wrong, even if it lacks the excellence of some of the more expensive and sophisticated designs.

It was only when listening to music transmitted from our own VHF/FM source that the limitations of the JVC tuner became known. Like so many tuners of its price, it softens and blurs images and introduces some slight sense of muddle, most noticeable when programme material gets complex. The climactic introduction to Carmina Burana was well conveyed in its scale and strength, but there was some slight smudging and muddle that lessened the differentiation and character of the individuals: it was like moving back from the performance to hear a more distant and vague rendition.

I don't want to overstate this effect though, for the JVC still had more insight and focus than many of its rivals. All in all, after throwing everything I could at the VHF/FM tuner section in the way of tests, I found it both balanced and entertaining. The same couldn't be said for the medium/long wave section that sounded mushy and severely muddied on Radio 1 (1053kHz), and had little clarity or bass. I got the impression that the AM section was an afterthought on this tuner.

### HI-FI WORLD MARCH 1992

**JVC FX-335L**

£104.99
PIONEER F-229L

£99.95

Whilst JVC and Denon distinguish tuning from the other controls by making them larger, Pioneer bury the tuning buttons and make them the same in size and style as all the other functions. Worse, there are two TUNING legends, which is even more confusing, I never found this tuner especially easy to use, nor self-evident in operation. The handbook was satisfactory, but it was also necessary. Station memorisation and selection both proved awkward as well.

Sometimes, awkward ergonomics are the price paid for bold styling, as with B&O equipment for example. Not so with the F-229L, whose legends were profuse and none too attractive. Printing thirty six station numbers on the buttons doesn't help here, even though it’s a necessity with the system of selection adopted. Each of twelve station selector buttons has three options, giving plenty of storage capacity. It can be allocated randomly and freely to any of the three wavebands fitted VHF/FM, long wave and medium wave. This means that, for example, a long wave station could be in store 2, and a VHF station in 3.

The Pioneer is a synthesiser tuner that steps up and down the VHF/FM band in 50kHz steps, the medium wave band in 9kHz steps and long wave in 1kHz steps. Just like the others in the group, it will tune either automatically or manually, but the latter process is carried out in mono and without interstation noise muting. Searching for really weak stations must be done manually in mono, which is sensible and it shouldn't be a problem. The blue fluorescent display panel shows frequency, waveband, stereo/mono mode and whether the tuner is accurately on-station (Tuned).

The rear panel carries screw terminals for AM and 300ohm FM aerials, as well as a chassis plug for a coaxial lead socket. In the UK an adaptor will be needed to get plug to mate with plug.

SOUND QUALITY

Put up against the Denon, with the Leak Troughline and Hitachi FT-5500 II references in the background, the Pioneer proved capable and interesting in some areas, but flawed in others. It sins were not quite as benign as those of the Denon. I found, although the fact that I reached this conclusion almost reluctantly and after a lot of listening and checking, shows that it isn't a tuner easily put down.

Across the mid-band, the VHF/FM section held a magnifying glass up to a performance. It displayed insight and analysis; individual violins in a section were clearly distinguished in a quite obvious fashion - vocalists came forward, but so did the choir behind them. This was a bit disconcerting, since it compressed depth perspectives, putting any and every performance into a flatish plane between the loudspeakers. I won't say 'flat' so much as not deep enough and certainly not plausible enough.

There were two contributory reasons. The general timbral quality of the '229 is light, due to its raised treble. This puts the emphasis on detail and resolution, at the expense of fullness of body and the reproduction of ambient depth cues. Dry or lean sounding bass also helped make the Pioneer sound thin. On Jazz FM the bass line behind Randy Crawford, for example, possessed main upper harmonics; it had little real weight. The references and the Denon TU-260L showed that bass fundamentals did exist and there was a good, if not forward, bass line. With more forward and dominant bass playing the Pioneer sounded acceptably dry and controlled, but let the rhythm section move back in the mix and it seemed to fade from view with this tuner.

Speech can be a discriminatory test of a tuner. Just as I was a bit taken aback to hear Sarah Locket sound almost basso profondo on the Denon when reading the news on GLR, so was I surprised to hear her sound high pitched and sibilant on the Pioneer. The presentation was quite markedly different - and neither tuner sounded very convincing. The natural fluency of the Leak Troughline shone through here.

With just a touch of coarseness as well, the F-229L, proved a bit limited in its subjective presentation I felt. It is analytical, but it is not especially balanced sounding or convincing in terms of naturalness. Our stereo generator again confirmed what I heard off-air; namely that the Pioneer emphasises the upper mid-band, offering a detailed performance, but one lacking real body or firm bass.

Hooked up to our indoor dipole, this tuner proved both sensitive and selective; it captures weak stations well.

Reception on long and medium wave was poor with the aerial supplied. Low sensitivity and little bass resulted in a noisy and somewhat gutless sound. The Denon put the Pioneer to shame in a direct comparison here.

### FREQUENCY RESPONSE

-3 +3 0 30kHz

Slight treble emphasis; no MPX notch

### DISTORTION

0.06% - 33dB

Very low distortion (0.06%)

### MEASURED PERFORMANCE

Pioneer have let the F-229L VHF/FM frequency response run unimpeded up to 20kHz. Signals above 15kHz or so are not transmitted on FM, to prevent interference with the pilot tone at 19kHz on stereo. The Pioneer's response can be seen in the analytic; note how it doesn't dive down suddenly at right, unlike the others. Another feature of interest and impact is the small amount of treble lift above 2kHz, since this affected the sound. All the same, the overall characteristic is flat enough, which means that the basic tonal balance will be right.

The drawback of not filtering out pilot and other, higher, signals, is that they can block Dolby action when recording onto cassette. Pilot tone at 19kHz from the '229 measured -33dB for example, compared to -60dB or better from the others.

Pioneer tuners have always had an advanced measured performance and the F-229L was no exception. It had very low distortion on stereo, averaging just 0.06% at 50% modulation. Just a small amount of timbre-lightening third harmonic exists.

Channel separation on stereo was very high, hitting 50dB in the mid-band, in spite of good separation and low distortion. Selectivity against which the two must be traded - was reasonably high at 73dB overall. Weak stations can be obtained when strong ones are close by.

Sensitivity was high and hiss sank to a minimum (full quieting) of -73dB with just 0.6mV from an aerial. Loft aerials can often provide this much, which means that the overall character is flat enough, which means that the basic tonal balance will be right.

The Pioneer measured well, but it does have peculiarities and some coloured its sound.

- Frequency response (-1dB) 10kHz - 16kHz
- Stereo separation - 49dB
- Distortion (50% mod.) - 0.06%
- Hiss (CCIR) - 73dB
- Signal for minimum hiss sensitivity
  - mono - 2.4V
  - stereo - 2.5V
- Selectivity alternate channel - 73dB
- Signal strength meter - none

### TEST DISTORTION HARMONICS

-0.63% TONE 1kHz
MEASURED PERFORMANCE

Much like the other tuners, the TU-XIIL was both sensitive and selective on VHF/FM. It will pick up weak stations off an inadequate aerial relatively well, but all the same, the simple wire dipole aerial supplied is unlikely to be satisfactory, except within a few miles of a transmitter.

The Sansui utilises a weak signal by reaching full quieting - the condition of minimum hiss - at a relatively low signal strength of 0.5mV. At and above this level of signal from an aerial (and it normally takes at least a four-element loop aerial to get 0.5mV minimum) hiss remains at its lowest value of -72dB. It is a figure around which all six tuners hovered, due to the similarity of their circuits. With a selectivity of 76dB this tuner is quite able to capture a weak station when it is close to a strong one.

The frequency response characteristic was one of the flattest of the group, as the analysis shows. This should and did - give fine basic tonal balance, free from obvious errors. Upward extension was to 15.4kHz, a high value, before a steep roll-off caused by a very effective pilot tone (or 'MPX') filter. It all but totally eliminated both pilot and sub-carrier, giving the Sansui a 'clean' output, free from unwanted signals above 18kHz.

Distortion was reasonably low on stereo, comprising second harmonic distortion, which is subjectively innocuous. Channel separation was adequately wide for full stage width to be reproduced and in using the staging qualities were good.

In all areas, the TU-XIIL measured well, it has no obvious or significant weaknesses.

Frequency response (-1dB) 4Hz-15.4kHz
Stereo separation -35dB
Distortion (50% mod.) 0.2%
Hiss (CCIR) -72dB
Signal for minimum hiss 0.5mV
Sensitivity
  mono 2µV
  stereo 20µV
Selectivity
  alternate channel -76dB
Signal strength meter none

FREQUENCY RESPONSE

-3          0          -3
50  1k  20k
Flat frequency response to 15.4kHz

DISTORTION

1%

0  TREBLE  DISTORTION HARMONICS  TONE 1k
0  MIDDLE  DISTORTION HARMONICS  TONE 1k
Some second harmonic distortion (0.2%)
TEAC T-X3000

£99.00

Teac like size: their products loom larger than those of competitors. So it was with the T-X3000 tuner: a unit marginally but critically larger than its rivals in this group. It looked altogether more substantial, even though actual differences were comparatively minor. The larger numerals of the fluorescent display were real enough though, a small but useful benefit of increased size. Otherwise, the T-X3000 proved to be all but identical in concept to its peers. It is a synthesiser tuner that steps and and down the VHF/FM band in 50kHz steps and the medium wave band in 9kHz steps. Teac don’t fit a long wave band: individual buyers can decide whether Radio 4 on long wave is a necessity, bearing in mind it is on VHF/FM as well.

In place of long wave, Teac fit an ‘MPX noise canceler’. The so called ‘canceler’ blends the two stereo channels together at higher frequencies to lessen hiss whilst retaining some channel separation. It can be useful where a wide sound stage is essential but hiss will wreak havoc, most notably in choral works.

Canceler apart, the T-X3000 offers the usual range of facilities, notably manual and automatic tuning, with mono/stereo interlinked. There are twenty station memories, provided by ten buttons which each toggle to give access to two stations. I found the Teac easy enough to use, but like the Sansui, I found its warning LEDs less easy to interpret because their accompanying legends couldn’t be read in low lighting.

Teac provide wire FM and loop AM aerials, together with a coaxial panel plug for FM and spring terminals for AM wire aerials. There is no 300ohm input.

SOUND QUALITY

The Teac sounded much like the other flat response tuners in the group - basically well balanced tonally, but with minor colourations and blemishes. On our main aerial, feeding it a strong signal, it became quickly apparent that, again, clarity was the real loser with the soft, imprecise in imaging and bland. In definition on Radio 3. It wasn’t that the Teac could be labelled ‘bad’, so much as a trifle soft, imprecise in imaging and bland. In particular, I found later that high frequencies were being dulled and muted and transients rounded off.

As always, speech in the form of a news broadcast, this time from Lucy Thorpe on GLR, drew attention to the softening and defocusing problem most cogently: I was very aware straight away that the closeness of the newscaster wasn’t really being conveyed well and sibilance that can usually be heard was muted.

The problem became more specific on complex music with fine high frequency events, such a striking bells. On Born to Run from GLR, Springsteen emerged from the overall massma of sound from the Teac, whilst he had a specific and quite well defined position on the Kenwood, as did the instruments accompanying him. The same problem was heard with Kate Bush trilling about being a Rocket Man (why do I find this incongruous?) on Radio 1. What appears to be a star is strummed quickly, the strings vibrating with their characteristic resonance on left and right channels. Teac showed again that, being dulled and muted, this little embellishment all but disappeared.

The Edwin Hawkins Singers were effectively merged into a uniform mass via the Teac, when singing Oh Happy Day. Through the Kenwood the choir was quite clearly defined on individuals and the soloist came right forward, clearly, into the left speaker, in a peculiarly close position, such was its clarity and analysis. The Teac portrayed a soloist, but further back and more as a part of the choir.

Working from an indoor dipole providing a weak signal, the Teac showed itself to be little different to the other tuners. Only on Jazz FM (102.2MHz) did I notice slightly less background interference than the JVC. The Teac had no trouble receiving a weak and unidentified Reggae station at 98.5MHz, just 0.3MHz below Radio 1, so it is usefully selective.

Working from our own VHF/FM generator I found that the X3000 has reasonable bass drive, but in contrast to the Denon in particular, it displays some coarseness.

The medium and long wave section gave mediocre results, suffering more hash and interference than the best, but of far apparent bandwidth. It was better during the day than at night.

MEASURED PERFORMANCE

A reasonably wide measured frequency response of 20Hz - 14kHz was produced by the T-X3000. The analysis shows that it was pretty flat, much like that of the other tuners, which means that good basic tonal balance is provided. The upper limit (14.3kHz) is a trifle low for open treble, but not low enough to make the tuner sound dull. This limit is set by the pilot tone filter, which was very effective in reducing pilot tone at 19kHz and sub-carrier at 38kHz, necessary to prevent blocking of the Dolby system when recording onto tape. Channel separation on stereo was satisfactory: wide right across the audio band, the minimum being -30dB at high frequencies. Though less than some of its rivals, it is still enough to allow the apparent reproduction of full stage width.

Most of the tuners in this group have low distortion, a situation much improved from that of a few years ago. The T-X3000 was by a small margin one of the worst of the group, producing an average of 0.25% distortion (50% modulation), which contained both second and third harmonic components, as the analysis shows.

Channel separation and distortion suffer when high selectivity is required - and the T-X3000 did prove selective. Tuned to a weak station, it will reject a powerful one close by with ease.

Sensitivity was up to that of most good tuners, just 30uV being needed to get hissy stereo. Ideally, all tuners need a lot more and the Teac started to work well with 0.8mV, the point past which it reached full quieting. Hiss sank to -72dB, at which level it is barely audible.

The Teac, measured well, offering good selectivity rather than low distortion and wide channel separation.

Frequency response (-1dB)20Hz - 14kHz
Stereo separation -35dB
Distortion (50% mod.) 0.25%
Hiss (CCIR) -72dB
Signal for minimum hiss 0.8mV
Sensitivity
mono 3uV
stereo 30uV
Selectivity
alternate channel -82dB
Signal strength meter none

FREQUENCY RESPONSE

-2
-1
0
1
3
50
1k
20k
Flat response to 14kHz

DISTORTION

-2
-1
0
1
2
3
4
-1% 
0% 
1% 
2% 
3% 
4% 
5% 
6%
Test: Distortion Harmonics 7kHz
Some second and third harmonic distortion (0.25%)
CONCLUSION

In essence, all five tuners were alike. Their size, operational method and basic layout are similar; their final performance closely matched. Tuned with five tuners, all providing uniformly good results, it is easy to get blasé and dismissive about them, suggesting that making a tuner is an easy exercise. In truth, even though today's tuners are usually pieced together from bought-in circuit blocks, the technology within them can be pretty difficult to master. However, the differences I found between all these tuners was surprisingly small, considering what latitude there is for general quirks and poor sound quality to make themselves known in the extensive circuitry of a typical VHF/FM tuner.

There are two basic aspects of VHF/FM hi-fi tuner performance that, although related, are best considered separately. One is the ability to capture stations (known as RF, or Radio Frequency, performance) and the other is the inherent sound quality of the tuner. Inevitably, there is a trade off between the two, but not an especially intractable or degrading one. The five tuners here give you no option on this matter, unlike more expensive devices. They lack the switchable RF/IF (Intermediate Frequency) options that allow users to make a choice between distant stations or better sound quality.

Every tuner on test had an extremely good RF performance; there was little to choose between them. It was assessed on the test bench using standardised (IHF - Institute of High Fidelity) test routines via a FM signal generator, and in practice by carrying out direct comparisons using a simple indoor aluminium dipole aerial, in addition to our six-element VHF aerial on the roof. This indoor aerial was a Maxview, picked up in one of the electronics shops on London's Edgware Road for about £10. It is equivalent in principle to the copper wire dipole aerials that are supplied with each tuner, but being rigid it can be stood in one position, away from walls. In our location, Central London, it gave a good signal from Radio 2 (700µV), but Radios 1 and 3 were weak at 140µV and 63µV respectively.

INDOOR AERIAL

With this simple and common form of indoor aerial, I simply swapped between the tuners to see how they pulled in various stations right across the band, from Radio 2 (89.1MHz) up to Radio 1 (98.8MHz) and Jazz FM (102.2MHz). The differences were minor and barely significant. There was the same amount of hiss behind Radio 3 and the same tendency to produce severe distortion on Radio 1 (due to multipath interference) for example, from all five models. I noticed slightly less background twitters on Jazz FM from the Denon and Teac, due to their superior selectivity. Since this was the only difference I could find after much experimenting, a conclusion the performance figures suggest, all five tuners can be considered identical in terms of RF performance, at least for all practical purposes.

Moving the aerial just a few inches had a far greater effect on reception than changing between the tuners. So if you live in an area where VHF/FM reception is poor, either because the local signal is weak or because you have no option but to use an indoor aerial, these tuners really are as good as each other, the Denon and Teac winning by a fine whisker.

So much for RF performance; all five tuners were equally good. Much the same situation existed with the five's audio performance. I found. Just a few years ago, differences in sound quality between most VHF/FM tuners were often quite obvious, primarily due to undulating frequency response characteristics, but often poor MPX (multiplex) filter design and termination were also to blame. Since then, the overall performance of tuners has been tidied up considerably. Just a glance at the individual frequency response plots of these budget tuners clearly shows that they are all pretty flat; a situation that would be near impossible with a similar sample of tuners in the past.

The Denon deviates most from flatness of frequency response, with a slight treble droop that was clearly audible as an obvious softening or warming of the sound. However, it remained lucid and possessed an open sound, staying free of the rather deadered dynamics of the others. I did notice that the Denon had an altogether bigger and warmer bass delivery than the other tuners. I suspect that this was due to its output being a bit euphonically enhanced, adding a useful fullness to its sound. There were times when I had severe doubts about its accuracy, but I did find that in practice, even when working from our own signal source, the TU-260L offered an attractive sound that was both easy and entertaining to listen to.

Whilst the Pioneer F-229L initially showed itself to be finely detailed and insightful, prolonged listening exhibited an emphasis on the upper mid-range, giving a light, gutless sound. Percussion like triangles, cymbals, hand drums and such like, jumped out of the mix with the Pioneer, but its bottom-end delivery was so muted I would hardly have known that Tracy Chapman's 'She's got her ticket was a reggae track. The Pioneer's inability to show frequency and memory number simultaneously was also irritating. Every time a station was changed, the memory number would come up first, introducing a pause before the station could be identified by its frequency.

Both the Sansui and Teac, whilst sounding very flat tonally, had some stodginess in their sound; they were lacklustre. Of all the tuners, these two were the most apparently neutral, yet neither captured my attention in any special way. They placed a heavy hand on the music, something that could easily be verified by listening to the original: a major advantage of using a signal generator in such tests. I don't want to be unkind to these products: they were only subtly below the others in terms of subjective quality and both were actually more balanced and accurate tonally. However, the rounded and thickened nature of their upper mid-ranges did remove some valuable sparkle and insight, making for a warm, but easy sound, quite high on atmosphere but lacking in crispness and analysis. Either could provide a lot of performance and entertainment at a low price. Their manufacturers have done well in fact, but in this group, others display small advantages.

The JVC FX-335L offered a bit more insight into a performance, without suffering undue brightness or thin-ness. It was one of the most impressive of the group, albeit by a small margin. I also liked its clear and attractive display panel and easy to use controls. Only the AM tuner section let the JVC down; it really wasn't very good. The FX-335L proved a fine budget tuner all the same. Although not perfectly balanced, it does offer good sound quality and all-round performance on VHF/FM.

The popularity of Denon's TU-260L was justified by this group test; it is an excellent all-rounder. I found it easy to operate, very good on AM, stronger than most in its RF performance and fine in terms of sound quality, while at the same time being the least accurate of the group subjectively. This might seem paradoxical, but the TU-260L has strengths that outweigh this particular weakness: the presence of bass power - something on ration in the others - being the most cogent. It gave the tuner a distinct edge subjectively. The Denon had a bigger and fuller sound than the others, but not one that could be termed either 'dull' or 'thick'. In fact, there was, I fancy, a little less congestion around the treble regions than that of the other tuners. Ask me which tuner I would choose of the group and, by a hairs breadth, I would select this one •

HI-FI WORLD MARCH 1992
antennae raised

No access to the roof, or no head for heights?
Noel Keywood examines some indoor aerials.

Indoor aerials are beginning to look hi-tech these days; they've become space age accessories. Most are for TV, but some manufacturers make sophisticated looking VHF/FM aerials too. With the increasing popularity of this waveband, we get more and more queries about their effectiveness, so here's a test of the most common ones.

Priced at £49.95 in a shop close to us, many people know about the Italian Cobra aerial (as opposed to the American Cobra aerial, which is rare in the UK), because it is widely distributed into hi-fi stores. Supplied by Bandridge (081-543 3633) it comes in a colourful box that is eye catching and appealing. Packaging is very important these days, as is styling and overall presentation. Gone are the days when bits of bent aluminium were acceptable. The modern indoor aerial has to look the part and make a statement in the home.

Nicknamed 'the flying saucer' immediately by us, the Omnivision from Maxview also looks sophisticated. It comes attractively packaged and is available in B&Q, Wickes and many other large outlets, Maxview told us. We first spotted an Omnivision in the Maplin Electronics catalogue and it was from Maplin (Tel: 0702 552911) that ours came, by return of post. They charge £39.95. Maxview said the recommended retail price is £47.95, but around £45 might be common.

As a reference we also used a simple rigid aluminium dipole, mounted on a one-foot square lump of chipboard (kitchen work top) that acts as a base. This unit is also from Maxview and is something I picked up for a tenner a few years ago. Apparently, it is pretty uncommon these days; Maxview told us there was little call for it, although the price has stayed much the same. That's a pity, because painted white (it comes in bare aluminium) it will sit unobtrusively on top of a wardrobe in an upstairs bedroom, which is an ideal place for an indoor aerial. Being 147cms wide, it can be awkward to position, but there are places where a dipole like this fits perfectly. Ours resides on top of a 7ft tall bookcase, where it is very effective.

The Maxview aluminium dipole is in principle a rigid version of the folded wire dipole aerials that are supplied with tuners. To give you some idea of what sort of improvement, if any, you can expect by buying an indoor aerial to replace one of these, we used one in the test for the purposes of comparison. Wire aerials are often strung up against a wall, which is not ideal; the wall weakens the signal and in many cases will not be at right angles to the transmitter, as it needs to be, since dipoles are directional and must face the transmitter side-on, as it were. This is one of the biggest drawbacks of using a wire dipole. A rigid aluminium dipole usually manages better, since it is self-supporting and not constrained to run along a wall.

A late but interesting arrival was the Parsec WaveCatcher from America, distributed by Path Group (021-776 7616). This tiny but stylish unpow- ered aerial sells for £19.99. It offers VHF reception as well as VHF/FM, the only aerial in our group to do so.

The Cobra and Omnivision aerials are powered and must be connected directly (Cobra) or indirectly (Omnivision) to the mains. Powered aerials have an amplifier in them that increases signal strength. Trouble is, the amplifier also increases noise by the same amount, so there is - in simple theory at least - no benefit. In fact we found that sometimes hiss did lessen by a limited amount as gain was increased, something that can be done on both the Cobra and Omnivision, so there was a small improvement to be had.

The Cobra is a tall (43cms), slim unit with a small footprint (2cms deep by just 6cms wide). It can be stood almost anywhere and in this respect is a convenient design. The vertical part of the aerial is 5cms wide. It is mains powered but the mains and signal leads are too short - at roughly 1.4 metres long - to give much flexibility of placement. In most cases the best place for an aerial is up high as possible, but with the tuner at bench height, like one might be in practice, ours couldn't be positioned close to the ceiling. Mains and signal extension leads would be needed, which rather defeats this aerial's convenience factor.

The Cobra is a VHF/FM aerial only and provides up to -10dB of attenu- ation, as well as +19dB of gain, the specifications say. Attenuation would be used in areas of high signal strength. A column of LEDs is fitted, but they don't show signal strength. The lower green one shows power and the rest merely lights in accordance with gain control position, something we felt was deceptive.
MAXVIEW OMNIVISION
The Omnivision is a grey plastic circular disc, 30cms in diameter, on a base that makes the unit stand 12cms high overall. It has an ancillary vertical rod aerial that, if used, improves signal strength, but then the overall height becomes 92cms. The signal lead is 4.7 metres long and coils neatly within the circular base. It allows the aerial to be moved to a high position, and this is the most effective way of maximising signal strength. A six-turn gain control is included, which gives from +6dB up to +26dB of gain over a bandwidth of 40MHz to 890MHz, wide enough to cover VHF/FM up to UHF TV. There is no form of frequency division, so the hi-fi tuner must be able to reject TV signals. Whilst we found this no problem, people close to TV transmitters might, since the TV signal could overload a tuner before the VHF signal was strong enough.

The aerial plugs into a mains power unit, which has a short flylead that plugs into the tuner. Maxview told us that inside the disc are four folded dipoles in a patented arrangement and that the unit is truly non-directional.

PARSEC WAVECATCHER
Used to aerials of dimensions related to wavelength (3 metres at 100MHz), I had doubts about the tiny Wavecatcher. Happily, they were unfounded. It is just 19cms high and 8cms deep, easy to place anywhere. However, in practice a short downlead of 1.7 metres limits the height and moved laterally for best results. It can easily be put in a high position for maximum signal strength. The Parsec is so small, and unpowered to boot, that I didn’t believe it would work. That it does, and well, is almost magic. Its short lead hampered placement and Radio 1 was weak when the other stations were strong, or vice versa, as the figures show. Being small and unpowered it can be moved easily. I fitted an extension lead and managed to find a position where all stations measured between 36dB (63µV) and 40dB (100µV), at which point the Hitachi FT-5500 Mk11 was sounding quite good. This aerial is for those who want something small and unobtrusive. It doesn’t bring in the strongest signal, but it is small, simple and inexpensive. These are its benefits.

The Cobra was about equal to the Parsec in basic reception efficiency but if gain was increased it did make some stations quieter and less prone to rasping crackle. I’m afraid there was variation in all the aerials though and, on balance, the Cobra with gain managed a little less well than the dipoles, as the figures suggest. It is the Parsec that is best seen as good for a compact aerial, again being for those who want something small and unobtrusive. The Cobra is expensive though.

The thing that everyone despises - the wire dipole - starts to look good in this test. It actually offers slightly better results than the Parsec and Cobra. However, the aluminium dipole is easier to position and, if there is a good place for it high up, then at £10 or so it is excellent value. But only if it can be got high and aligned correctly will this aerial offer improvement over a wire dipole and the powered aerials. Nevertheless, this simple aerial has the most potential and is the best value.

The Maxview Omnivision with the telescopic aerial fully extended vertically gave the best all-round results. It can easily be put in a high place which is a further benefit. However, the simple truth is that if you are expecting significantly better results than those from a wire dipole, then even this unit might be a disappointment. We found it gave a little less hiss and cracking from most stations, but not all, and raising gain with the user adjustable control often did not help. On Radio 1 it gave obviously more hiss than the rigid dipole for example. Nevertheless, the Omnivision offers the best balance between ease of positioning, cost and performance. We found it sounded reasonably quiet and crackle free on the greatest number of stations.

Conclusion
Perhaps the most surprising conclusion as far as most people are concerned is that specialised indoor aerials actually offer a slightly worse performance than simple dipoles, including the bits of wire (folded dipoles) that come with every VHF/FM tuner. Their main advantage is small size and domestic acceptability. However, if small size itself allows placement in a high position, higher than a wire dipole for example, signal strength is likely to be strengthened. The Parsec is fine in this role, except that it needs an extension lead.

Highest performance is offered by the Maxview Omnivision, but only by a small margin. Again, there is no substitute to placement in a high position for maximum signal strength.

Tests
The aerials were placed at the same height and moved laterally for best signal. Signal strength was measured and assessed for quality with a Hitachi FT-5500 Mk11 tuner.

Our first finding was that the two small aerials, the Cobra and Parsec, were more position sensitive than the large ones and there was a greater variation in signal strength between stations with them. In some positions, certain stations would almost disappear. When the best spot had been found both these aerials proved slightly worse than the dipoles. However, they still have some advantages.

The Parsec is so small, and unpowered to boot, that I didn’t believe it would work. That it does...

<table>
<thead>
<tr>
<th>Aerial</th>
<th>Radio 2</th>
<th>Radio 3</th>
<th>GLR</th>
<th>Capital</th>
<th>Radio 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wire dipole</td>
<td>40</td>
<td>37</td>
<td>48</td>
<td>43</td>
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</tr>
<tr>
<td>Rigid dipole</td>
<td>40</td>
<td>42</td>
<td>45</td>
<td>45</td>
<td>42</td>
</tr>
<tr>
<td>Cobra</td>
<td>29</td>
<td>33</td>
<td>46</td>
<td>37</td>
<td>34</td>
</tr>
<tr>
<td>Omnivision</td>
<td>43</td>
<td>46</td>
<td>50</td>
<td>46</td>
<td>42</td>
</tr>
<tr>
<td>Parsec</td>
<td>36</td>
<td>34</td>
<td>34</td>
<td>37</td>
<td>20</td>
</tr>
<tr>
<td>(higher)</td>
<td>(36)</td>
<td>(38)</td>
<td>(40)</td>
<td>(36)</td>
<td>(38)</td>
</tr>
</tbody>
</table>

Here are the signal strengths (dB) the aerials gave across the band. The wire was strung up properly, away from a wall and facing the transmitters, like the rigid dipole. The Cobra and Omnivision figures are those of the aerials without gain. The Parsec gave the results in brackets (higher) with an extension lead that allowed better placement.

20dB = 10µV
30dB = 31µV
40dB = 100µV
50dB = 316µV
The evening that the Sequel amplifier arrived at my home couldn't have been more appropriate. I had spent the afternoon before listening to a Creek CAS4140 Series 2 which had been, in the not too dim and distant past, one of designer Mike Creek's babies. However, the Creek Audio name is now owned by the TG1 (Tannoy Goodmans International) group, and Mike, who left the conglomerate's employ to pursue a freelance career, has had to come up with a new banner under which he can release his designs. His new business trades as EMF Audio, the abbreviation being Electro Motive Force. Production is based at the original Creek premises, his family's factory North of London.

The second part of the EMF Sequel's name will seem equally appropriate to anyone comparing the amplifier with one of Mike's previous designs: the familial resemblance is readily discernible. That isn't to say that the old and the new are indistinguishable one from another... but let's not get ahead of ourselves. Before revealing whether it was the butler who did it, we ought, at least, to familiarise ourselves with the story's leading character.

The Sequel is a strictly minimalist, integrated design, offering the barest of necessities: controls for power on/off, input selection, volume control, tape monitoring, and a headphone socket are all that grace its facia. The rear-panel layout echoes Mike's previous designs: RCA phono sockets - rather closely spaced - for inputs, and two sets of 4mm sockets for loudspeakers, the first pair of which is marked 'direct' and is permanently connected to the amplifier's output stage, while the second is switched such that the feed to the speakers is muted when a plug is inserted into the headphone jack.

The proportions of the case-work are similar to those of the CAS4000 series amps but the Sequel's all-metal case is a wee bit larger and encloses the rear-mounted heatsink. Unlike the CAS amps, which looked individual and distinctive, the new amplifier appears to me rather anonymous and unremarkable. There's nothing actually 'wrong' with it but I can't visualise many purchasers beaming with pride whilst showing it off to their friends.

The new amplifier is fully contemporary - in mass market terms - in its intent, being primarily designed to cater for line-level sources. Compact Disc in particular. A phono input is provided but it can be easily removed to make way for a line-voltage source. Creek insists, however, that the Sequel should not be regarded as a switching unit which also amplifies; he'd rather it be regarded as a quality power amplifier with volume control and modest control facilities. If you want more - and the Creek CAS4140S2 didn't previously being reviewed and the results had been favourable. Despite the fact that the speaker's price made it seem inappropriate - and it does give a better performance with a better amplifier - its open-sounding character allowed the amplifier's presentation to be easily and fully scrutinised.

What became apparent the minute that I began listening to the Sequel was the 'complete' nature of its tonal balance: there was none of the low frequency paucity which commonly marks out inexpensive amplifiers, nor any lack of body or depth in the midrange or treble regions. The result was that instruments and voices appeared substantial and solid, not bleached or artificial. Mary Black's latest CD, Babes In The Wood, sounded particularly fine in this respect: the rich harmonic content of piano and acoustic bass was well maintained and the singer's voice appeared finely detailed but not at all contrived. There was no hint of exaggeration, the presentation having proper integration and cogency, yet with the benefit of a lively, natural 'bounce' and vibrancy.

As it stands, however, the Sequel has these minimal pre-amp features and in this form Mike said it would cost £299. I used it with my Naim CDS as the main source component. Various speakers were employed but for the most part I ran a pair of £1099 DynAudio Contour 1.3's wired to the amplifier with Sonic Link 'Care' cable. I had used the same set up with the amplifier doesn't even include any line stages (see Noel's technical comments regarding its input sensitivity) - the designer suggests that you purchase a dedicated pre-amplifier to provide them. This tempts me into the semantics arena where I'll ask why did he not dispense with all the switching and control functions and call the unit a power amplifier? The CD-only user, envisaged as the prime customer, could then use a passive pre-amp instead. If we're talking about a modular approach why not go all the way?

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Mike Creek returns to the amplifier scene with his new EMF Sequel. Malcolm Steward tells the tale.

There was no hint of exaggeration, the presentation having proper integration and cogency, yet with the benefit of a lively, natural 'bounce' and vibrancy.

The Black Rock Coalition CD...
"The History Of Our Future" demonstrated the Sequel's acuity with matters temporal, which seemed on a par with Creek's eponymous designs. The drummer's backbeat which gives dadadooda-da's "Son Talkin" its effusive character demonstrated both the overall similarity and the slight difference between each amplifier's presentation: this musical device's toe-tantalising push had leapt to prominence on the CAS4140S2 whilst on the Sequel its presence was still felt but less acutely accented. The track retained its inevitable groove but with the displaced beat not announcing its position in the lyrical metre quite so pointedly, the music's drive was ever-so-slightly diminished. Regard this, however, as a particularly subjective feeling: rhythmic subtleties don't affect all listeners in the same way.

Blue Print's "M.L.K... Check!", from the same CD, showed that the Sequel was no waffler when bass ventured into the wicked zone. The Chapman Stick bass used on this number comes - subjectively, it seems - perilously close to DC at times. These floor-board threatening excursions didn't disturb the amplifier's composure in the slightest. Its grip seemed unrelenting, the bass retaining its tunefulness, note shape and speed all the way down. The searing sax on the next track, J. J. Jumpers' "Workout", showed that the amp's sobriety extended throughout its bandwidth, the instrument's ear-splitting upper partials still intimating the imminent destruction of the listener's hearing apparatus but the threat never being realised. Too many amplifiers let go during this song's intro and before you've reached the first verse the temptation to skip the track - and miss a really good number - becomes irresistible. The Sequel lost none of the music's attack or razor-edged dynamic but kept excess well out of the picture. The sweet, measured treble of the DynAudio 1.3 played a useful role here: a speaker with a ragged top end would yield at high replay levels with such extreme provocation. So take note when auditioning this amplifier: its top end doesn't shut down early to make it sound nice'n'cosy with fifty-pence tweeters.

Londonbeat's "9am (The Comfort Zone)" showed another facet of the Sequel's orderly, controlled personality. Each vocalist's voice was clearly and unambiguously presented across the soundstage, finely detailed and delineated during harmony sections.
WHEN THE SUM IS EVEN GREATER THAN THE PARTS.

Improbable, you may think, considering that here we have three outstanding audio components, each one highly acclaimed in its own right.

For example, no single integrated amplifier has been so widely praised around the world as the NAD 3020 series, making it the largest selling amplifier in audio history.

With the introduction of the new, upgraded 3020i, Hi-Fi Choice commented; ‘This latest version of the classic 3020 is as competitive as ever, it sounds fresh and buoyant but still sharply focused and delightfully detailed.’ Not surprisingly, the NAD 3020i was judged as a ‘Best Buy’ by the same magazine.

The NAD 5420 compact disc player has also received extraordinary acclaim from the audio critics. ‘Genuinely convincing music that lives and breathes!’ is one quote from Hi-Fi Choice which we feel says it all. Once again, a

A system which is perfectly matched and perfectly balanced, with each component drawing the maximum performance from the others. The sound is clear and open. Exciting and detailed. Vocals are projected well forward. Instruments can be defined and placed. Bass is extended, clean and tight, and the stereo sound-stage combines depth and spaciousness. There are no unnecessary frills, just the bringing together of audio engineering at its very best.

In fact, the only sum which is less than you may have thought is the price.

Check it out at your nearest NAD specialist dealer today.
With long experience in designing and marketing minimalists amplifiers cast in the classic UK mould, Mike Creek has the ability to produce an amplifier that is stable and predictable. The Sequel contained no surprises in its measured performance, just as I expected. It produces 50 watts of power per channel, a figure that increased healthily to 72 watts into a low load. The increase isn't especially great; the ideal is a doubling of power (i.e. to 100 watts).

Fifty watts is enough to give quite high volumes in a normal room, but not enough to go very loud. The Sequel, like all fifty watt amplifiers of course, is meant to drive budget or mid-priced speakers of normal sensitivity to a 'sensible' level, rather than extremely loud.

The Sequel is about average in terms of its power increase into a low load, which suggests it has a respectfully low output impedance and will control loudspeakers satisfactorily. Even though our loudspeaker measurements show that most speakers have a very high nominal impedance and draw little current, there does still appear to be a good correlation between bass quality and regaulation. I would expect the Sequel to sound well controlled in its bass, although it would be unlikely to exhibit the apparent control of amplifiers with stronger power supplies giving better regulation - but these cost a lot more.

**Disc Option**

The amplifier is sold as standard without a disc stage, for those who have deserted LP. I am sure that the hi-fi world configure the phono sockets to act as an ordinary line input, like CD, tuner, etc. In this form, there are four ordinary switched inputs that run straight into the volume control, as usual, plus a tape monitor input, all of which are made to go very loud. The Sequel, like most speakers have a very high sensitivity affects the result. An equivalent input noise value of 0.55μV is the only useful guide to hiss level in use and this is satisfactorily low. The fact that the N553.2 low noise/distortion integrated circuit is used (about the most popular choice today for audio circuits) is almost enough to guarantee good results.

The input overload threshold was adequate if not exceptional at 46mV. Even the highest output cartridges rarely give more than 30mV on musical peaks, I have found from measurement. Input capacitance measured 220pF and impedance 50kΩ, both correct values. As with any new amplifier of good pedigree and, therefore, of great interest to buyers (and dealers), I tested this amplifier thoroughly. There are some minor blemishes that should be elimi-

**Test Results**

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>50watts</td>
</tr>
<tr>
<td>CD/tuner/aux</td>
<td>4Hz-43kHz</td>
</tr>
<tr>
<td>Separation</td>
<td>-83dB</td>
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<tr>
<td>Noise</td>
<td>-108dB</td>
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<tr>
<td>Distortion</td>
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<tr>
<td>Sensitivity</td>
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</tr>
<tr>
<td>DC offset</td>
<td>0mV</td>
</tr>
<tr>
<td>Disc</td>
<td>30Hz-44kHz</td>
</tr>
<tr>
<td>Separation</td>
<td>-74dB</td>
</tr>
<tr>
<td>Noise</td>
<td>-73dB</td>
</tr>
<tr>
<td>Distortion</td>
<td>0.006%</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>2.2mV</td>
</tr>
<tr>
<td>Overload</td>
<td>46mV</td>
</tr>
</tbody>
</table>

**Distortion**

The only visible harmonic distortion is the 0.004% referred to above. This is the result of careful and knowledgeably engineered product that I expected, given Mike Creek's successful past in amplifier design it measures well. NK
SEPARATES

What we hear is as individual as what we see. While some of us warm to a Pavarotti aria, for others anything but a Led Zeppelin classic will make their blood boil. And each one benefits from a different sort of hi-fi reproduction, so who better to put together your system than you?

Choose a combination from our extensive list of components. Each designed to reproduce perfectly an infinite range of sound, both individually or as part of a high performance system. And all tailor-made for your ears only.

Separates shown:
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- ST-G70L Quartz Synthesizer AM/FM Stereo Tuner
- RS-8985 Quartz Direct Drive, Dual-Capstan 3 Head Cassette Deck
- SL-P570 Programmable Compact Disc Player with MASH

Contact your nearest Technics dealer as listed in Yellow Pages & Thomson's Directories.

Technics
For Music Lovers.
Microdac at a mini price

Alan Sircom listens to Micromega's new Microdac, a CD convertor with a price to match its size.

Micromega's latest product, the £299 Microdac is one of the cheapest digital-to-analogue convertors (DACs) on the market. Only the Arcam Black Box I and Kelvin Labs' convertor are cheaper. The other two currently available, relatively low price, convertors are the Audio Alchemy Digital Decoding Engine and the Deltec Little Bit, at seventy to a hundred pounds more. This marks Micromega's move into a lower price sector. Their Logic and Leader Compact Disc players are more expensive than the Philips players they are based on. The Dual digital-to-analogue convertor is up in the same realm as the Meridian 203.

The Micromega Microdac is the first of a couple of basic building blocks; a matching budget transport, the top-loading Microdrive, will follow this year.

Last month's conclusion to our group test of DACs, transports and integrated players was not too favourable as far as cheaper DACs were concerned, with the more expensive player likely to be as satisfying as a low cost transport and DAC combination. For those wishing to upgrade a cheaper player, a £400 DAC may not prove as successful as a good £400 player. At £299, the Microdac offers a serious alternative, due to its lower price alone.

The Microdac, as is typical of digital to analogue convertors, is minimalist in the extreme. It is a box with a light on the front, If that sounds too simple, it's a small box with a light on the front which glows in traffic light colours: red for warm-up and green for go. If the light is amber, it means that the Microdac cannot lock onto the digital signal correctly.

The Microdac omits some of the switching circuitry of the Duo, such as the phase inversion switch and the optical/co-axial switch. This last is selected internally, although the selection process is a bit sticky. It essentially works by defaulting to the input selected when switched on. If one should wish to swap inputs, but not switch the device off, the input needs to be plugged in to 'offer itself up.' It is then removed and replugged. If not, nasty bursts of white noise occur as the Microdac fails to 'see' it. As Micromega only supply a coaxial lead, I believe that they expect most people to use the coax and indeed, it seemed to sound slightly more solid than via the optical link.

This highlights most of the controls at the rear of the Microdac. At the extreme right of the rear panel are the two gold-plated phono outputs, followed by the 'opto' optical and 'coax' coaxial inputs, an IEC mains socket and a voltage selector that is reassuringly difficult to change to the wrong voltage. The box itself is basically a perspex sandwich - two sheets of black perspex top and bottom, with a powder-coated middle wrap. It is roughly the same size as a small hardback book, at 220mm wide, 60mm high and 155mm deep, and it weighs 1.5 kg sitting on its four rubberised feet.

Micromega recommend that all their DACs need a healthy run-in period, and the Microdac is no exception to this rule, needing a good couple of days before settling down. It is also a good idea to leave the DAC, as well as most solid state hi-fi products, powered constantly; as its power consumption is only five watts, it will not cause a major hiccup in the 'leccy bill. To assess its vices and virtues, I used the Microdac with both a Teac P-500 transport and a Philips CD 850 player, with both optical and digital inputs. As mentioned before, I compared the Microdac against the Audio Alchemy DAC in every case. The digital source was connected, via Audio Note Silver and Audioplan Music Cable Super X-Wire to an Audio Innovations Series 200 preamplifier. Power amplifiers used were the Audio Innovations First Audio and Audio Note Neuro triode designs, both of which pump out a massive seven and a half watts, while the loudspeakers were Audio Note AN-Ks on Huygens stands.

Family Sound

Micromega products seem to have a 'family' sound that the listener will either love or hate - the Microdac sounds very similar to the Duo DAC that I found so endearing a few months ago. From memory, I would find it very difficult to tell the two DACs apart. At £500 or so, the Duo has its followers who feel, as I do, that it is difficult to better. At £299, the Microdac effectively lays the competition waste.

At this low price (for a DAC, at least), most convertors sound as if they have been compromised in some way. The Microdac, on the other hand, hides its low cost beneath a patina of quality. Sitting atop the Philips player, the Microdac greatly improved its perform-
The Microdac is a budget Bitstream converter that uses Philips' SAA-7323 convertor. Bitstream from Philips runs at a higher data rate than the Japanese systems, because it is a true one-bit system. As a result, layout and screening difficulties are more severe, and any problems are more apparent.

Although Bitstream was exploited because it promised lower distortion, when unwanted circuit interactions come into play, distortion can and often does appear. Micromega suffer from this problem with the Microdac, probably due to its small size. They are not alone - so do many other DACs we test. The distortion analysis picture clearly shows distortion components as spikes. These are order-order harmonics, third, fifth, seventh, etc., commonly considered to add a sharpening and coarsening tinge to the sound. In this favour, overall level was reasonably low, so I wouldn’t expect the sound to be very obviously affected; it might be very slightly coarsened, at worst.

Arguably worse was the fact that both the channels fail to resolve signals below -80dB. tones at -85dB and -90dB were just not reproduced at all, hence the peculiar distortion figures greater than 100% ! In practice, an inability to resolve low levels will erase ambient information and fine cues the ear relies upon to interpret the situation in which the recording took place. However, this phenomenon won’t always be heard. Many - but certainly not all - Rock recordings don’t have a lot of low level information in them, or it is masked by the generally high music levels that are maintained. Classical recordings may, superficially, seem to be more a victim to this problem, but only when the recordings themselves are fully dithered and very linear, which currently applies mostly to the latest recordings made by the best equipped and most informed engineers. Nevertheless, even though the Microdac’s performance limitations are unlikely to make themselves known except under particularly revealing circumstances, ideally they should not exist.

Frequency response has an interesting and not quite tilt downward toward high frequencies. This is used to give a ‘warm’ sound from CD, more akin to that from vinyl. There was a 4dB difference in noise between the channels, but at -92dB worst case this is academic, since at these levels noise is inaudible. Some unwanted spurious outputs existed above 2kHz, but the latter were not too strong. Whether these will ‘fold down’ into the audio band to affect sound is open to conjecture, but it certainly is a possibility. Again, it is better if such things don’t exist, but this is a budget DAC.

Channel separation was good at all frequencies and output fairly normal at 2.36V. The dynamic range figure is poor because of the distortion generated at -60dB, this being a measure of such distortion, weighted to favour audible mid-band components. Again, there’s nothing especially impressive here.

Micromega’s Microdac has quite a few measured weaknesses and it is tweaked to give a warm sound. NK

Test Results

Frequency response 4Hz-20kHz

<table>
<thead>
<tr>
<th>Distortion</th>
<th>Frequency response</th>
</tr>
</thead>
<tbody>
<tr>
<td>-6dB</td>
<td>0.008</td>
</tr>
<tr>
<td>-30dB</td>
<td>0.039</td>
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<tr>
<td>-60dB</td>
<td>1.6</td>
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<tr>
<td>-90dB</td>
<td>361</td>
</tr>
<tr>
<td>-90dB dithered</td>
<td>168</td>
</tr>
</tbody>
</table>

Separation

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>1kHz</td>
<td>-105</td>
</tr>
<tr>
<td>10kHz</td>
<td>-92</td>
</tr>
</tbody>
</table>

Noise

<table>
<thead>
<tr>
<th>Noise</th>
<th>-96dB av.</th>
</tr>
</thead>
</table>

Dynamic range

<table>
<thead>
<tr>
<th>Output</th>
<th>95dB av.</th>
</tr>
</thead>
</table>

Distortion

<table>
<thead>
<tr>
<th>Distortion</th>
<th>Frequency Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.03%</td>
<td>+0.5</td>
</tr>
</tbody>
</table>

Down tilt in frequency response gives warm sound.

The Microdac, in my opinion, offers the most of the Alchemy, in the process giving a greater body to vocals that was considerably more credible. Both had a similar tonal character, probably due to their use of the 7323 chips, but I still found myself finding the Microdac the more alive and ‘funkier’ of the two DACs.

Ultimately, when compared to leading edge transport/DAC combinations the little Microdac begins to show its patchiness, like a loveable mongrel at a pedigree dog show, but I would find it difficult to suggest a DAC available under £600 that betters the little Microdac. At best, other DACs can only match its overall performance. When one considers that usually these are more expensive, it puts the Microdac’s worth into perspective.

With the Teac P-500 transport, value for money was not in question. At a combined cost of around £900, competition from the single box players is fierce, but the Teac/Micromega combination had a lot to offer.

I feel that the off-board DAC is an excellent way of upgrading a tiring CD player. The choice of DAC is of primary importance, however, as too accurate a DAC will show up more problems than benefits. A lesser DAC, on the other hand, offers little in the way of improvements and is ultimately limiting when time comes to improve the transport. The Microdac, in my opinion, offers the right balance, improving the performance of the player, but still having much in reserve when a transport is added at a later date. There are few bargains in hi-fi, but the world-class Microdac represents excellent value for money.
MANA MINI-TABLE

Paul Hartley, our cover photographer (only hi-fi nuts work for us!), describes yet more changes and improvements to his system brought about by Mana tables.

When I finally shuffle off this mortal coil, scatter my ashes over the nearest Homebase car park or bury me beneath the anaglypta aisle at B&Q, my latest stab at DIY has resulted, after a lot of swearing and gnashing of teeth, in some new and (though I say so myself) better shelving to house what seems to be an ever burgeoning hi-fi system. I do seem to have acquired rather a lot of different boxes recently; yea, power supplies and DACs and that sort of thing. Now this is all very well, but they do need to be put somewhere and I'm not the sort of person who's particularly keen on shoddy so-called hi-fi furniture with festoons of wire hanging out the back. So my equipment resides in a sort of alcove on wooden shelves and this looks just fine, especially with the turntable resting on the top shelf perched on a Mana Sound Frame. With a bit more space now available, the plan was to substitute the Sound Frame for a Mini Table which in theory will allow me to slide the Pink Link power supply underneath - heat hush!

The Mana Mini Table is essentially the top bit from a Reference table and is constructed from the usual welded 'L' section steel, spiked above and below and supporting a nicely finished smoked glass shelf. The Mini Table not only looks a dam sight better than the Sound Frame but scores over it when it comes to rigidity, being far stiffer and less prone to flexing or twisting. Setting up is not particularly tricky; you don't need engineering qualifications, just an Allen key, spanner, a good spirit level and an ability to read the instructions supplied.

So, armed with the confidence of the ignorant, I soon had the table assembled, all locking nuts nice'n'tight and the glass dead level. Sharp raps with my knuckles on the glass over each spike confirmed everything was tickety-boo so I gingerly placed the Linn on it, slid the Pink Link underneath and hooked it all into the rest of my system, which consists of a Naim 72 pre-amp plus Hi-Cap power supply and NAP 250 power amplifier driving a pair of Snell Type Ks on Pirate K4 stands.

Ry Cooder's Bop Til You Drop is one of those favourite records which has remained a favourite despite being trotted out at umpteen dealer demonstrations over the years. So it seemed an appropriate first choice with which to explore the effects of the Mini Table.

From the first opening bars of music there was that expansive depth and clarity that only Mana tables seem to extract. As with the Sound Frame, the music seemed to flow and breathe. Each musician had his own space yet they all played as a whole - good stuff! But I wasn't surprised. It was only what I had come to expect from a Mana product. What I didn't expect though was the improvement at the lower end of the scale. The bass not only seemed deeper but there was far more detail to each note. They stopped and started with an agility I'd never heard in my system before. It was as if an obscuring layer of mosh had been wiped away to reveal the genuine article beneath but not, I hasten to add, at the expense of quantity.

...it often seems to me that in Hi-Fi speak, articulate bass means lean bass - not this time! The Snell Ks are fine and revealing speakers but not exactly famous for curdling your intestines. Now, however, they were delivering bass insight and quite respectable levels of boogie.

We're not talking an extra octave or anything silly here, nor are we talking the right and day improvement I noticed when I changed from a Torlyte board to the Sound Frame. What I am saying is that the Mini Table is a damned fine turntable support that significantly improves the sound of a turntable and, what's more, improves on the already enviable performance of the Sound Frame.

I can't think of another way of spending the £125, which is the Mana's asking price, that would yield such big improvements to just about any system. Indeed I tried placing the old Sound Frame beneath my ageing Marantz CD-85 Compact Disc player which feeds into a Deltec Little Bit convertor.

The results were encouraging. Whilst not making a silk pursu out of a sow's ear, it definitely improved the sense of space and soundstaging, at the same time softening that steely glare that CD's exhibit.

The next project for an idle afternoon is to investigate the effect when the Mini Table is placed under the amplifiers... Hmmmmm... but then I'd need to make the shelves deeper and remake them - oh rats!

AUDIPLAN MUSICABLE

Alan Sircom becomes entangled in pythonesque coils of cable from Germany and Scotland.

This month, I have uncovered one of the hi-fi industry's 'secrets'. At hi-fi shows throughout the land, many companies use thick cables that look like silver water hose. A few years ago, when the American magazine 'The Absolute Sound' got their hands on this cable - although in an earlier guise - they deemed it to be the best around at the time. Doyens of this stuff are often seen towards the end of the shows, draping their loudspeaker cable over their shoulders, looking like mountaineers. Musicable, as it's called - by Audio Plan of Germany - is not cheap, but the results are almost second to none.
Cables often fall short when it comes to perceived value. While months of sourcing, listening and development take place, the finished product rarely looks the part. Often people look disbelieving when the cost is mentioned, especially when what is visible is only a thin piece of wire.

You get plenty of value for money with MusiCable cables, however. Dressed in a plastic coated silver braid, they are thick and solid looking. The interconnect cables are tagged for directionality, using white arrows on blue stickers. The loudspeaker cable goes even further - with the two thick hosepipes braided around each other. Even the thinnest of their loudspeaker cables has the appearance of plastic coated rope, while the largest in the range looks as though it could easily tow a supertanker.

Looks ain’t everything, however. Beneath the plastic exterior there beats a heart of pure silver plated copper. The insulation itself is of prime importance. On the larger interconnects, the cheapest AF Mk4 cable, at £90 for a metre pair, has four shields and a Teflon insulation. The next in the range, the £130 Super AF sports six shields and a microphonic shielding, together with Teflon insulation. This shielding is made from a mystery material, but its yellow fibrous appearance suggests that it is some form of Kevlar.

The smaller X-Wire is designed for low level signals, such as turntable, tuner, tape or digital source. Once again, the shielding and insulation plays a part in the quality of the cable. Standard X-Wire costs £100 per stereo metre, while the Super X-Wire costs £66 more. These can be supplied with any permutation of connector, such as phono, BNC, XLR or even a turntable arm plug. Finally, the loudspeaker cable comes in three varieties: LS3.5 at £8.50 per mono metre, LS6 at £20 per mono metre and the £40 per mono metre LS12.

Every cable is supplied terminated, as one would need an arc welding torch instead of a soldering iron to put plugs on the bigger interconnects. On the smaller Super X-Wire, high quality Teflon insulation is used, while the other cables in the range have gold phono plugs to fit. The loudspeaker cables are fitted with a unique banana plug, to allow bi and tri-wiring. Made from silver-plated copper, this has a 4mm hole to accept other 4mm plugs in a 'piggy-back' arrangement.

While this is a good idea in theory, as bi-wiring this cable would otherwise be virtually impossible, it does have a couple of drawbacks. First, I am not convinced that this creates a perfect contact area, although this is a minor reservation. More importantly, bits of bare loudspeaker plug are exposed, which can touch together to cause a short circuit in the amplifier. I did this once by mistake, causing untold damage. In fairness, it must be said that bi-wired cables that are not soldered together are often connected at the amplifier terminals and they often suffer the same fate.

As I have discovered with high quality cables, all the MusiCable cables needed to 'bed-in' for a few days before their true worth becomes apparent. Over this run-in period, the cable develops a deeper bass and a wider and better controlled soundstage. Once fully run in, I found the MusiCable cables, especially the Super X-Wire, to be truly world class performers. When the Super X-Wire was used to connect Compact Disc to amplifier, it gave life to the sound like the first spring morning after a long, hard winter.

The most obvious improvement is in stereo separation and imagery, although the more one listens to components through the cable, the better the cable becomes. To begin with, one first notices how precise the soundstage has become. Instrumentation is clear and detailed, with a good sense of space around individual instruments. As one listens further, the most subtle details begin to appear from the depths of the recording as if the CD is directly connected to the amplifier.

One should look at the cables as a complete package. Each adds to the sound quality, although certain cables are best suited for certain needs. Super X-Wire works best connecting source to amplifier, while Super AF works best between pre and power amplifier. The loudspeaker cables can also be tailored to suit both loudspeaker and budget, with many people using LS3.5 for the treble unit and the larger LS6 Mk2, or even the hefty LS12 Mk2 for the bass. I would suggest using MusiCable throughout the entire system, but if this is not possible, start with the source and then work through the system.

I have only been able to evaluate the Super X-Wire and Super AF interconnects, together with two lengths of the LS6 loudspeaker cable. I have been able to use it in a number of systems, however. While the loudspeaker cable will not shine with amplifiers like Linn, Naim, Exposure and NVA who design their amplifiers around specific cables, the quality of the MusiCable cables appears to shine through almost any system.

In this respect, it behaves in a similar manner to the Furukawa cable tested recently. In comparing the two, the Furukawa has the edge when it comes to bass detail, but the MusiCable cable appears to delve deeper into the music making the system a more vibrant, crisp and musical performer. The MusiCable is twice the cost of the Furukawa, however.

With hi-fi being turned upside down and sideways by giant-killing products such as the Pioneer A-400 amplifier and Rotel's CD player, cabling has become more important than ever. Given such a system, the addition of MusiCables could readily turn a good system into a superb system. As with the Furukawa before 't and cables from Audio Note and Moth, the Audioplan has become a part of my reviewing arsenal. ☑
The floorstanding Castle Chester loudspeakers, tested by HI-Fi World’s court jester, Eric Braithwaite.

Way back, I remember, I once had a pair of CastleRichmonds, one of the first loudspeakers they put on the market; I never stopped admiring the quality of the veneer. Castle’s new £99 Chester maintains the Yorkshire company’s reputation for woodworking skills. Its unusual finish provoked some admiring glances. None of your boring black ash (though this is one of eight options); our review samples were in an eggshell-finished Yew which wouldn’t shame an antique. Like Rosewood, it is not cheap so an extra twenty per cent goes on the price for these veneers.

Though floorstanding and quite lofty at 94cm high, the Chester won’t intrude on the best of an interior decorator’s fancy. Its footprint is relatively small for a speaker of its height, but in consequence the floorboards need to be even. I live in a Victorian flat whose builders apparently couldn’t afford either a set-square or a spirit level, and I had some difficulty planting the Castles firmly on the floorboards need to be exactly right. There had to be a mixture of three different materials for the damping, and a new driver had to be designed for it.” So why pick on it at all? “I’ve been a fan of that type of loading since I heard it in the Fifties,” said Colin. “In our view” – and here he included design consultant, Colin Walker, who built the Walkerdeck turntable back in the Seventies - “you can achieve remarkable clarity and detail in the mid-range. You can’t get from any other loading because the box resonances get in the way.”

A Column and a Horn

Loosely speaking, and trying to keep it intelligible, quarter wave loading is a cross between a column and a horn. Without any refinement, a straight column, while allowing a drive unit to shift a lot of air with a relatively small cone movement, would resonate at its fundamental frequency and probably sound objectionable. Tapering the column - where the quarter-wave pipe begins to resemble a horn - dampens these objectionable resonances.

Colin Walker told me that one of the difficulties in designing a quarter-wave horn is that if the drive unit is placed at the top of the “pipe” then there are some nasty third harmonics resulting. Placing the drive unit one third of the way down and tapering the pipe practically eliminates them, and the mid-range opens up with increased clarity compared to a reflex design, he said. Mind you, the theoretical pipe is then about seven feet high, so for manageable dimensions domestically it’s folded. “The top of the pipe is actually at the bottom, if you see what I mean,” said Colin, just a moment’s thought, and I did. “It’s a very old design,” added Colin, “but it gives a life to a loudspeaker that few seem to have these days.”

Life is not something I’d argue with. Warming them up, I’d left Jazz FM going through them for the day, and coming home I was greeted with a tenor sax solo that had a big sound to it that I’ve never stopped admiring the quality of the veneer. I live in a Victorian flat whose builders apparently couldn’t afford either a set-square or a spirit level, and I had some difficulty planting the Castles firmly on their spikes. For all that, I was pleased to note some solid brass bushes in the base to screw them into.

The Chester is something of a departure for a company which has produced a number of two-way designs, and has stuck to its own ferro-fluid tweeter and doped paper cone drivers through thick and thin. This is still a two-way design, with the metal dome tweeter placed below the main (paper) drive unit, so the seated listener will still be on the line of its axis.

What is even more intriguing is hidden inside the cabinet and only hinted at by an oblong foam grille down at the bottom near floor level. It looks at first sight as though this might be a transmission-line speaker a la TDL, which, in its slim and upright, squared-off shape it somewhat resembles, but it isn’t. Nor is it a rectangular reflex port. This is a speaker which uses something called quarter-wave loading, now almost forgotten, but once associated with the name of Paul Vogt, a pioneer in loudspeaker design back in the thirties. “Fundamentally,” said Castle Director Vic Sapsford, “it looks very simple, but the dimensions of the cabinet have to be exactly right. There had to be a mixture of three different materials for the damping, and a new driver had to be designed for it.”

The theoretical pipe is then about seven feet high, so for manageable dimensions domestically it’s folded. “The top of the pipe is actually at the bottom, if you see what I mean,” said Colin, just a moment’s thought, and I did. “It’s a very old design,” added Colin, “but it gives a life to a loudspeaker that few seem to have these days.”

Now, larger groups, and multi-tracked recordings fared less well. Despite a fairly complex crossover, the metal dome tweeter does have a metallic tinge to it. On multi-miked drum kits, cymbals and triangles separated themselves from the rest, once disconcertingly appearing to be below the drummer. Lateral imagery could have been more precise, too, if we are going to be faddy about it. Solos and vocalists were rather difficult to pin down and allocate a precise shape to. Yet Miles Davis’ trumpet was so brassy and real, his sidesmen so on the ball and vigorous, I decided to forget I was an image freak and wallow in it.

Miles Davis’ trumpet was so brassy and real, his sidesmen so on the ball and vigorous, I decided to forget I was an image freak and wallow in it.
generally. A loudspeaker that doesn't
come out squeaky clean and colourless
(in both senses of the word) in a way I
can't help but have an affection for:
there has to be life in live music, and the
Chesters offer it. They aren't cleverly,
minutely analytical; they don't have
serious bass - no more than a bookshelf
design, but then it's the mid-range they
were concentrating on.
The bass is warm without preten-
sions, and the combination of this with
the clarity of the mid-range must have a
lot to do with the Chester's talent for
starting and stopping at the edges of
notes: there are no problems distin-
guishing a quaver from a semi quaver.
They won't shock you out of your seat.
or reach out and stun you into dazed
admiration. They present a kind of cosy
Constable landscape rather than a
Cubist abstract, something which allows
an enormous amount of sane listening
pleasure, if not one of the ultimate great
loudspeaker experiences.

**Measured Performance**

I was pretty surprised to see the frequency
response of this loudspeaker appear on
screen; it is unusually flat. Large loudspeak-
ers usually have a bumpier response than
small ones, although the Chester is in fact
more a small loudspeaker in a large box,
having just two modest drive units.
Castle make their own drive units and
they seem to have learnt a few things over
the years, since it is rare to see a multi-driver
loudspeaker exhibit a frequency response
like this one. It means that the Chester
should offer a good sense of basic tonal
balance, with low and high frequencies in
the right proportion to each other. Dispersion
was good over the usual forward listening
angle, the response changing relatively little
over a normal range of listening heights.
It's always interesting to try and corre-
late measured performance with subjective
impressions. In this instance I had listened to
the Chester beforehand and I thought it
sounded fundamentally well balanced, but
with a tinge of 'glassy' brightness. By this I
mean that there was no sharpness of the
sort that comes from a peaky tweeter, but
there was an emphasis in the treble that
pushed high frequencies forward, making
the sound slightly hard and brittle. Close
inspection of the response characteristic
shows that there is in fact a small lift in
output at 1.5kHz and it continues upward to
5kHz. This, I believe, is audible and respon-
sible for the brightness. All the same, the
Chester struck me as offering a basically
'correct' sound, free from missing or em-
phasised frequency bands, so its flat re-
sponse is of merit in subjective terms. The
slight plateau lift throws information for-
ward a bit as well, making for an apparently
lucid and revealing presentation.

I also felt the bass was dry and heavily
damped. There is some slow roll-off in out-
put below 300Hz that contributes to or is
indicative of the mechanism that produces this.

The Chester proved similar to Celest-
ion's 700 loudspeaker, tested in this issue,
in terms of its impedance characteristic. A
minimum impedance of 6.6ohms is reached
below 10Hz, which is acceptable. This won't
load an amplifier. Above this frequency two
peaks push overall impedance up to 12ohms,
which is a high value. It makes the Chester
an easy load, but it also compromises sensi-
tivity and amplifier utilisation. Like the Cele-
sion 700, the Chester will only draw 30watts
from a 50watt amplifier. However, because
of better efficiency, although the impedance
is high, sensitivity remains normal at 86dB
sound pressure level for one nominal watt
(2.8V) of input. Whilst this is not high, it
means that the Chester will go as loud as
most loudspeakers at any particular volume
control position.

Manufacturers commonly like to put a
real watt into their loudspeakers for the
sensitivity figure, I am discovering, even
though this gives efficiency rather than sen-
sitivity - a parameter of little practical conse-
quence to owners. The Chester managed
88dB SPL with such an input, a figure I
include for the purposes of comparison.

Castle have produced not just a fine
looking, but a well engineered loudspeaker
in the Chester. It has one of the flattest fre-
quency responses I have ever measured and
good dispersion. It is an easy load and it is
sensitive. NK
We describe the power zoom system of the Pentax Z-10 in our literature as being intelligent.

But that's a bit of an understatement.

Because, with two 8-bit computers on board (about as much hardware as a state-of-the-art CD player) the Z-10 is the brainiest Pentax we've built so far.

And yet, paradoxically, it's one of the simplest to use.

Its power zoom lens has three speeds (as well as a manual override).

It will focus for you (and even bleep to tell you when it's done it).

The autofocusing system is the fastest yet. And its operation is 'predictive'.

This means that when an object (such as a race horse) is hurtling towards you, the lens is able to compute how fast the object is moving and will focus on the point where it will be when the picture is actually taken.

The Z-10 has 'multi-segment-metering' which automatically reads the light from six areas of the frame to expose completely and correctly for you, even in the most difficult conditions.

(By the same token, you can concentrate on just one area if it needs a greater or lesser exposure. We call it 'spot-metering'.)

TO BE AN EXPERT PHOTOGRAPHER, YOU ONCE HAD TO BUY BOOKS. NOW YOU NEED ONLY BUY A CAMERA.
The system also has an Image Size Tracking mode. So that someone walking towards or away from you can be photographed again and again while staying the same size in shot.

You can even zoom on one subject, log it in the camera's memory, then zoom on another.

The camera will return to your first setting automatically when you return to your first subject. We call this the 'Zoom Clip Mode'.

And speaking of modes, there are more.

The Z-10 has a programmed AE mode. A Bulb mode. A Flash mode (it has its own built-in flash). A metered manual mode. And even a Hyper Manual mode.

In all honesty, we could go on and on and fill a whole library with the wonderful things the Z-10 is capable of.

And how it can put very sophisticated photography in very easy reach.

But all we're going to say is that a trip to the camera shop is an absolute must.

Because just one look at the Z-10 will speak volumes.

You don't need luck, you need a PENTAX.
READING WHAT THE CRITICS SAY, 
YOU’D THINK THAT REVIEWING MUSICAL FIDELITY 
IS A LABOUR OF LOVE.

Our hi-fi is well known for its ability to arouse passionate emotions.

“By the time the cedenza had been reached, I was a mass of goose bumps,” sighed one reviewer, describing how hearing Mozart’s Sinfonia Concertante on the new A120 from Musical Fidelity integrated amplifier enhanced his perception of this favourite work.

His emotional experience took place during the Andante movement, which is the spiritual core of the music.

“It’s a 27 year old recording and whilst it makes no great sonic demands on the system, it’s easily destroyed by ham-fisted processing. In the case of the A120, the concentration and the magic were all there...” he reports with pleasure in High Fidelity magazine.

He's not the only one who finds Musical Fidelity highly involving.

“Personally, I’ve always been a fan of the A1”, confesses another critic in High Fidelity. “Now Musical Fidelity has seen fit to introduce a MkII version... First impressions were of a slightly leaner, tidier bass, no loss of midrange warmth or clarity and that distinctively crisp yet slightly understated top.”

Getting to know the new A200 integrated amp, High Fidelity’s reviewer was delighted to find that “it allows intimate contact with all the emotional power of the music... its overall control, fine pitch definition, dynamics, delicate handling of other low level information all placed it highly in my estimation.”

While in CD Review, another critic was smitten by the charms of our P180 power amplifier, confiding “My impressions are of an amp that definitely has personality... a sort of transparent musical signature: namely a combination of strength, control and easy flowing momentum. The P180 has power and current aplenty and will capably handle any speakers thought ‘difficult.’”

Then there is the writer for Hi-Fi World who had a brief encounter with the P180 married to its outboard Choke Regulated Power Supply (CRPS) and was excited to discover that the upgrade makes the amp “sound more controlled and refined... improved the imagery and added a spaciousness to the sound, while improving upon the sense of tightness in performance.”

He was frankly poetic about the remarkable sound quality of the P180 with CRPS, going into rhapsodies over its “Passion, Grace and Fire.”

Perhaps reading these comments has aroused within you a strong desire to experience these pleasures for yourself.

Don’t let unsatisfied longing torment you, instead pay a visit to your hi-fi dealer and listen to the latest products from Musical Fidelity. You’ll soon begin to understand why hearing is believing.

MUSICAL FIDELITY

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SYSTEM, SYNERGY AND SIRCOM
A complete system for under a thousand pounds put together by Alan Sircom.

This system, complete from source to speaker and assembled for both vinyl and Compact Disc users, is based around the best of the various items which we've had on test over the last year. The target price is a maximum of £1000. For those who have abandoned vinyl and only use CD, the cost comes down to mid-system levels at just £599.69. Vinyl junkies who use CDs solely as beer mats would need to pay £794.70.

Compact Disc reproduction is provided by the Philips CD618 which we looked at in October 1991; amplification is the Arcam Alpha 3, also reviewed in that issue; speakers are the new Mission 761i's on their own stands. The LP source is the Systemdek IIX-900, reviewed in August 1991, but fitted here with a Goldring 1012.

Why include a turntable at this late stage in the LP's career? First, if you own even twenty-five LPs, the cost of replacing them with CDs is actually greater than the cost of this record deck itself, assuming that the average CD is now around £1.4 for a full price disc. Replacing a substantial collection of LPs, assuming that every recording was available on CD, would still be uneconomic. It is more cost effective to buy a turntable. Secondly, many people still believe that the LP still sounds better, but this is not the best place to get into such a discussion.

Three of the four components in this hi-fi system have been recommended over the last twelve months, with at least two of them (the Systemdek and the Arcam amplifier) gaining industry awards last year. Only the Mission loudspeaker, by virtue of it being just launched, has not received much critical acclaim. Previous loudspeakers in the cheaper Mission family have been extremely popular and I have no reason not to expect the same reaction to the 761i's.

The Systemdek IIX-900 turntable needs no introduction. It has remained as one of the low-priced vinyl champions, along with the Rega and Revolver turntables. They have all become the standard which other turntables at the price aim to beat. Unlike many rivals, the Systemdek has a suspension, akin to more expensive turntables like the Linn Sondek, Pink Triangle and the Voyd.

Recently, the Systemdek has been revamped, with the addition of an aluminium arm board, hence the '900' part of the name. Another option,
**CLASSIC SURROUNDINGS FOR CLASSIC HI-FI**

Relax, sit back and enjoy the music in one of our comfortable listening rooms. No pressure, no obligation. Just a chance to select from a range of the world’s best Hi-Fi. Judging one system against another. Selecting the best sound in a helpful and informed atmosphere. Finally we ensure that the system you choose will sound as good in your home as it did in our listening rooms.

---

**ACOUSTIC ENERGY, ARCAM, AUDIOLAB, AUDIO RESEARCH, CASTLE, CELESTION, DELTEC, DENON, DUAL, EPOS, KEF, KOETSU, KRELL, LINN, MARANTZ, MERIDIAN, MUSICAL FIDELITY, MISSION, NAD, NAKAMICHI, NAIM, PINK TRIANGLE, QUAD, ROTEL, SENNHEISER, STAX, TANNOY, TDL, WHARFEDALE, YAMAHA AND A RANGE OF ESSENTIAL ACCESSORIES.**
although until recently not one supplied by Systemdek themselves, to change the platter to acrylic, a la Pink and Voyd. Opinions are divided as to its worth; it seems that those who like the Linn/Roksan/Tabanz are much more lenient; they seem to like the acrylic plattern version. The Moth tonearm which we had fitted to the Systemdek is also a hardy perennial, an OEM model indistinguishable from the Rega RB250. Both it and its more expensive RB-300 brother are difficult to better at the price, although the newer, but still more expensive Roksan/Tabanz is another high-quality, low-cost success. Where the RB-250 scores over these tonearms is in its simplicity. It’s a one piece arm tube, with only the barest essentials in terms of adjustment. Vertical tracking angle (VTA), for example, can only be altered by a series of spacers at the arm-base. Although ultimately bass-light (unlike the RB-300), the RB-250 is rarely put to shame, even when used with cartridges costing more than the arm itself.

**Even Natured**

The Goldring 1012 cartridge is considered to be one of the most even-natured moving magnet designs at the price. Along with many moving-magnet cartridge designs, like the Arcam 77 range, the Ortofon 500 series and the two Roksan Corus models, the 1012 is upgradeable by replacing the stylus with a more expensive alternative. As with the Rega arm, this cartridge can be a giant killer, putting a great many more expensive cartridges to shame.

Philips’ CD618 Compact Disc player, along with the Marantz CD-52, dominated our group test in last October’s issue. It was a close run race sonically, but the Philips player just pipped the post against the rather too analytical Marantz. It was only after the listening test had ended we discovered the Philips was the cheapest of the group at £169.99. This made us change our conclusion from ‘winner’ to ‘outright winner’, and a bargain to boot.

This player, being in a fast-moving market, is destined to stay competitive or so Philips’ strategy suggests. They have lowered the price of the CD618 by £20, to only £149.99 which makes the 618 virtually unassailable.

Arcam’s Alpha 3 amplifier is a similar product, in that it pulls far ahead of the competition and even shows up many amplifiers that are more expensive. The Alpha 2 it replaced was a good, but an ageing design. In the wake of the huge commercial success of the Pioneer A-400, the Arcam amplifier had a great deal of ground to make up. The improvements made to the Alpha 3 surprised many people, making it the one to beat at the £200 price point overnight.

It is still a very new design, barely six months old. In those six months, however, it has come to be the British answer to the A-400, and a very coherent answer at that. To its credit, the Arcam has received praise without any of the hype that surrounded the Pioneer on its launch. As with the LP vs CD debate, this is not the place for a discussion on the relative merits of the two. Both have their merits, both have their failings.

Finally, the Mission 761i loudspeakers are very new, having only been reviewed last month. They are part of the new wave of Mission products, following their near-disastrous factory fire last year. One of the areas that was totally destroyed was their research and development department. Older R&D departments have a tendency to collect superfluous and outdated test equipment, too expensive to replace with newer devices; Mission were forced to scrap all their older equipment as it had been roasted. This has meant that Mission’s new R&D department sports the latest test equipment, optimised to suit their needs.

**enjoyment is fine, but when it turns Mahler into Scott Joplin, or Leonard Cohen into Half Man, Half Biscuit, then something is amiss**

One such piece of equipment, used in designing the 761i, is an anechoic chamber computer simulator. This works by recording the acoustic of a room, cancelling its influence within the computer and then giving the plot of the loudspeaker itself. As no chamber is completely anechoic, this very expensive system is said to get closer to theoretical anechoic conditions than a real anechoic chamber. Mission’s 761i loudspeakers are an example of this design work, following in the footsteps of their earlier successes, including the 761 which they will, ultimately, replace.

In a system such as this, areas like cables and tables make major differences. My normal recommendations here, Audio Plan Music Link or Furukawa cables and Mana tables may seem a little OTT for many other alternatives to this system at the price; none are better, merely different.

As a complete system, our jigsaw of recommended components pieces together nicely. Each component represents the best value at the price; to better any one involves raising the ante considerably. Combining the best of breed, therefore, should give us the best system at the price, in theory at least. While, as I have suggested, it is not perfect, the flaws are comparatively minor. It difficult to find a better sounding system, without going over the budget of £1,000. There are many other alternatives to this system at the price; none are better, merely different. If I were looking for a £1,000 turntable and CD based system, I would feel that I had got my money’s worth from these components.
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We are located approximately 1.5 miles from both M3 and M27.
Cary Audio Design's £1295 CAD2A3 valve power amplifier evokes strong reactions even before it makes music. A shiny chromium-plated chassis, exposed output valves that glow indescent blue and orange like a neon-lit car bonnet on a rainy night and contrasting black output transformer covers that loom large against them make this amplifier a visual feast.

An awkward peculiarity that I came across immediately was independently powered pre-driver valves (6SL7), run from a separate twelve-volt heater supply comprising an external mains transformer with a plug-in connection to the rear. When powering up, the pre-drivers must be switched on before the rest of the amplifier; they light like blue touchpaper before the other valves begin to glow, something that happens after the main power switch has been activated. This combination of power supplies I have reservations about, since switching the pre-drivers on or off at the wrong time can send strong thumps through to the loudspeakers. It seems to be an ad hoc arrangement unnecessary in other valve amplifiers and, I can't help feeling, used expediently in place of a more workable solution in this case.

Running along the centre of the amplifier chassis are a pair of SV4G rectifier valves; a solid state supply is not used. Behind these is a laminated core mains transformer with top cover, flanked by two Cary-designed output transformers in their own sealed boxes. User options are two switches for introducing eight percent of feedback into the system, or running it as a zero-feedback amplifier. The rationale for this pair of switches, proof positive that this is a dual Mono design, is that people are said to prefer the sound of the amplifier without feedback, even though feedbackless amplifiers are rare.

For more in the September last month's article about the larger 211 triode, the 2A3 follows on a stony beach, indicative of a problem in the orchestra pit. There was a good sense of imagery, although brought up to date by the presence of modem switches, terminals and graphics. The 2A3, 211, 845 and the 300B, drivers on or off at the wrong time can send strong thumps through to the loudspeakers, with a good sense of dynamic range and coherence. Given well recorded passages of music, with a powerful, dramatic air, the CAD2A3 rang the dynamic changes with ease, combining well with a balanced sense of the performance taking place.

I wanted to like the Cary CAD2A3. It's relatively inexpensive as valve amplifiers go, looks the part, and is one of few designs using these triode valves. Though its sound quality is compromised by the surfing noises, it was open and pleasant all the same. If the design problems could be sorted out, it might become as clearly defined and forthright as its rival from the Audio Innovations stable.

N.B. I contacted the importer, Reference Imports, with regard to the noise problem. They suggested that the level of noise I encountered with the Cary is uncommon. Unfortunately, a second CAD2A3 was not available at the time of writing, to test this.
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We've been called a lot of things but boring is not one of them.

One critic says in Audiophile that our four-box 112 Watts per channel Chronos pre- and power valve amps look like Battersea Power Station. But after listening to them (perhaps with eyes closed), he called them awesome and says he was gobsmacked: "I had little idea quite how much sheer gut-thumping power such a beast can deliver. Believe me, it's frightening..."

Another reviewer bravely says Chronos are "quite gorgeous" adding that they look "a damn sight better than your standard parallel sided breadbox."

To judge from his review in Hi-Fi News & Record Review, he likes the sound, too. "Across the bandwidth it sounded forceful and in control...

"But it's the mid-band (isn't it always?) that makes tubes the choice of the connoisseur, and here the Chronos positively sings."

Then critics from Hi-Fi Choice had their say. "From the opening bars of the music you can hear that Chronos is in the top league. There's that sense of ease and spaciousness which is so characteristic of high quality valve amplifiers... Chronos power amplifiers can swing dynamics which will take your breath away."

In their view, the Chronos soundstage is "as close to 'being there' as the limitations of the listening room and the recordings are ever likely to allow."

At Michaelson Audio we recognise that not everyone has room for our massive monuments to valve supremacy.

So we also make Odysseus, an integrated valve amp. It looks "slightly less outrageous but the aesthetics are still a matter of taste," according to Hi-Fi News & Record Review. It's "a high-end monster in (almost) budget clothing..."

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Perhaps by now you are asking yourself, just how weird do Chronos and Odysseus look? And why is there no picture of them in this advert?

The reason is this: we want you to visit your hi-fi dealer to hear and see them in person.

Call them stunning or bizarre, they'll probably leave you speechless.

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Classical Quads

Hi-Fi World’s monitor loudspeakers comprise Quad ESL-63 electrostatic loudspeakers combined with Celestion SL-6000 sub-woofers, using a special crossover. Rumour had it that somewhere in the depths of the giant Philips organisation the same combination was used for professional purposes. We recently discovered it was Philips Classics, the recording label - and they were bringing them to London to record Rossini’s Messa di Gloria with Sir Neville Marriner conducting the Academy of St Martin’s in the Fields. The setting for this recording was the Eighteenth Century church of St John the Evangelist in Smith Square, Westminster, London - known to radio listeners from the lunchtime live concerts broadcast regularly on Radio 3. We had to go and look. Eric Braithwaite was interested in the music; Noel Keywood in the monitors.

PHILIPS were recording this work as part of the celebrations for the two-hundredth anniversary of Rossini’s death. It has rarely been performed or recorded; the last recording (also Philips: LP 6500 612) was made in the seventies and deleted in the mid-eighties.

Why had Erdo Groot, the Balance Engineer (who is responsible for the technicalities of the recording) and Erik Smith, the Producer (responsible for seeing the recording through from the day the artists are contacted to the day the Compact Disc booklet is printed) chosen St John’s?

“I've recorded here for fourteen years. It's an excellent acoustic for choral and orchestral works, with even reflections in the reverberation,” said Erdo. “There's a high ceiling; the orchestra has a beautiful warm quality; the strings can really shine in this sort of acoustic and the bass end has a very full and bloomy sound, though the hall itself has a tendency to brightness.”

I noticed that the stone floor was covered in sheets of wood where the orchestra sat. “We bring it with us in pallets there's a thousand kilos in weight. Otherwise reflections from the floor would harden the sound; sometimes you don’t want it to sound like an empty church. It can give good results from chamber music groups almost up to large symphony orchestras. I wouldn’t do a Mahler symphony in here, but Beethoven symphonies are excellent for the acoustical size, and for opera it's also very good, specifically because it's so good on the vocals.”

At the back of the church, behind the imported wooden staging for the chorus, there are two large curtains. Later on in the session I noticed these were open for the choral takes and closed for the tenor solo. “When the chorus has left it changes the reverberation - like the difference between a hall full of an audience and an empty one.”

Recorded ambience was important then? He was not happy with artificial added reverberation, often used to ‘round out’ an otherwise dry sound: “I like to hear the acoustic of the place where the recording is made.”

This year, Erdo will spend a hundred days on location: he was leaving for Philips Classical’s headquarters in Baam the following afternoon, thence to Paris and on to St Petersburg (Leningrad, for those who haven’t caught up with current events) to record Swan Lake at the Kirov Theatre. Back in London at the end of February, he would be returning to the Kirov afterward to record...
Tchaikovsky's Pique Dame. "It's a superb acoustic, the Kirov."

That reminded him of something. "We don't always use this many microphones," he said, gesturing to the array of booms. "I've recently recorded Romeo and Juliet at the Kirov" (with Valery Gergiev conducting) "which we did with only four microphones. We recorded Mussorgsky's Khovanschina there as a live performance using only ten mics." (That is for a fairly sizeable orchestra, soloists and chorus covering a big stage.) The company knew the score, so they could act and move around as though it was live. For that we used a tube (valve) mixing console. We used a tube (valve) mixing console; there as a live performance using only ten mics. (That is for a fairly sizeable orchestra, soloists and chorus covering a big stage.) The company knew the score, so they could act and move around as though it was live. For that we used a tube (valve) mixing console. We used a tube (valve) mixing console; there as a live performance using only ten mics. (That is for a fairly sizeable orchestra, soloists and chorus covering a big stage.)

The first few bars. There is a prominent part of the strings? "Yes, we are being a little discreet," was the reply. A third take went down to two track digital. "I think the sound is spectacular; I think you will, too." The recording will be issued on the Philips label later this year.

I sat in on the last session while the Philips team (Erik Smith, Erdo Groot and recording engineers Roger de Schot, Jan Wesselink and Nico de Koning) retired to the control room. As always, the professionalism of a London orchestra like the Academy of St. Martin's is fascinating. Like filming, recording sessions are short bursts of furious activity interspersed with spells of boredom, while, say the chorus is instructed by the conductor or Chorus Master. There was a difficulty: some individual voices among the basses in the chorus stood out too much, and had to be asked to project less. At one point, Erdo's voice came over the "talkback" in the hall, asking Sir Neville "Could we have a little more from the strings?" "Yes, we are being a little discreet," was the reply. A third take went flawlessly, with the opportunity to chat for a few minutes while Sir Neville dashed back to the control room to listen to the recording. There was another problem too; there were a series of mis-takes in the first attempts at recording the Gloria. It seemed that it would never get up and run beyond the first few bars. There is a prominent part for the cor anglais, and the principal was unwell. The developing tension was lightened by the string section suddenly playing the theme to Desert Island Discs - complete with amazingly authentic squeaking seagulls - while tenor and cor anglais took a breather.

As Sir Neville lifted his baton the fun was over - absolute silence fell and the take went into the bag perfectly.

At ten o'clock on the dot, the session ended. "I think we've achieved what we wanted," said Sir Neville, as musicians and technicians began packing instruments and music stands. Though Erdo believes in long takes, rather than constructing a recording almost bar-by-bar, a three-hour session results in only a few minutes of what will be used in the final master. Erdo stood watching as the cable - Van den Hul, I suddenly noticed - was reeled up. "It's made to our specification; it's all high-end, here," he grinned.

Rossini: Messa di Gloria
Academy of St Martin's in the Fields, conductor: Neville Marriner.
To be released by Philips Classics later in 1992.

THE MONITORS

NK Where did the idea for combining the Celestions and Quads come from? It's a rather unusual combination.

EG Philips Classical in Holland had a past history of using the original Quad electrostats, and the new one came along at almost the same time as the B&W 801 which was chosen by the other two companies in the group - Deca in England and Deutsche Grammophon in Germany. We went our own way a bit with the Quads; I think the electrostatic principle, if applied correctly, gives results that no moving-coil loudspeaker can easily achieve. We were already experimenting with several subwoofer types and crossover filters, and as soon as we heard about the Celestion 6000 we asked for a pair to try and went on from there. We found it gives us the best results to date.

NK Do you feel the Celestion is satisfactory, or would you rather it was a bit faster sounding?

EG No, I'd agree with that; on certain material I feel it's not damped enough; that is something that could be improved. This room has always been a problem for monitor sound because it's fairly narrow, and you have terrible standing waves at very low frequencies. If there's a noisy truck standing outside, they all build up in here.

We need to get all our equipment in, so we're a bit limited in positioning our loudspeakers. It is possible because it's a figure-of-eight system; with an omnidirectional bass it doesn't matter how you position it, with this one the angle makes a lot of difference in how you excite the room modes. We can put the Quads where we want them, but change the position of the Celestions. If we used Quads only, the low frequencies - the one would tend to be too much in the corners which excites the room modes too much and you get lumpy bass.

EG No, I don't agree. It depends on the room and how you put them in it. We have several listening rooms in Holland; in one of them we have the ESL 63s on the top of Quad stands, about ten centimetres high and angled slightly backwards. In that room - it's a very dry room - we have a flat response to 40Hz.

NK You must have work quite hard setting them up.

EG We have to go to different locations and work in totally different rooms; this is a problem for all sorts of loudspeakers as well as these. Of course, level is a limitation. The advantage here, with a system with a separate bass, is that we can drive the Quads louder. We reproduce a sound level here that goes to 96dB at the listening position - but that is 6-12dB lower than a full orchestra in the auditorium.

They're positioned within one centimetre, exactly three metres apart, three metres from the listening position in an equilateral triangle. Knowing a lot about them in practical terms now, we find we can get good results most of the time.

NK I put layers of felt at the back on a frame six inches away from the loudspeaker; it makes them pseudo-omnidirectional, and cuts out the rear radiation.

EG Which I think is a shame, because you lose the acoustical power of the speaker. The advantage of the dipole is that it can give you the rear radiation in such a way that if it's diffuse enough it adds to the total acoustical power without muddling the clarity. It depends on how the reflections are built up in time. You see in this narrow room we have some felt near them.

NK You're doing a similar thing to me but I'm being a bit more total about it.

EG In our listening rooms in Baam (Philips Classical's Headquarters in Holland) we try to use as much of the rear radiation as possible but with the right sort of diffusion of the reflections from the back so that it gives the acoustical outlook we need. We have these diffusers here which are specially designed to give a difused response at a certain frequency range. They use slots at different depths - they work like the sonic equivalent of the colours of oil in a pool of...
water, the way you get light light coming in at one angle and out in different directions. This is what it does with the sound; it goes in at one angle, comes out at different angles. So basically it diffuses the sound within a certain frequency range, which helps get back the rear radiation in such a way that it’s diffuse enough not to interfere with the first direct sound.

Our attention turned to the equipment in what had once been the Church’s vestry, a large - analogue - mixing desk, two Sony professional DAT recorders and associated processors, and a British A/D converter from Data Conversion Systems.

EG The A/D from Data Conversion Systems is very expensive! It has a Signal-to-Noise ratio, I think, of 1 10dB - which is over the theoretical limit, but it’s a different theory. It uses Bitstream conversion techniques - it’s 4-bit - treating the dither, which is very important in any conversion system, in a very clever way which is beyond my technical knowledge. I’m afraid.

NK You combine the output of all the microphones in the hall in the mixing desk before you digitize it?

EG Yes. There are people now who work with digital mixing desks and treat every microphone with A-D conversion, and then mix it, but the quality of A-D conversion with so many converters is not as good as our upgraded analogue system. This desk is our own design, it’s under development all the time. At the moment it’s completely DC capacitorless from the input to the output, and the sound quality is better than we can get from a digital desk.

EB It sounds as though you’re going to stick to analogue mixing. You’re not optimistic about improvements in digital desks?

EG No, not at all. At the moment, there’s nothing in our view to compete - for the way we work - with the analogue circuitry we use before going to the recording medium.

NK Which is - DAT?

EG This time, yes; and also at the same time it goes onto a 24-track digital machine; I record the two track stereo master on that as well as the other groups of instruments, the soloists and the choir. So if it’s all necessary after the recording to do any re-balancing I can do that in a digital mixer, because its only been digitised once - it’s digital to digital. All our recordings, whether they are done multitrack or two track, are digitised once, then they stay in the digital domain till the listener plays them back on the CD in a domestic system, with the quality depending on the D-A converter.

We had trodden carefully around the reeds of Van den Hul cable in the auditorium on the way in, and spotted two main pairs of microphones on high stands - one pair in front of the orchestra and another before the soloists’ position, four others in front of the chorus’s raised platform and several others on booms in amongst the orchestra.

NK How are you using the microphones?

EG That’s a long story in itself. We have a main system using Bruel & Kjaer, with a flat response; we have the special reflective addition on the top of the microphone which boosts the high frequencies a little bit, but in an even way. For the chorus - which is too far away for one system, it wouldn’t work - you have to have another main system. I use four Schoeps: a very flat, very good microphone. Then you need a few spot mics, sometimes to get a balance problem right, or a better attack.

EG It depends on the sort of piece you’re recording. With the speakers always set up the same way I know exactly what sort of spread I want to achieve and the depth of the perspective. If it’s a large symphony orchestra you’ll have more depth than if it’s a Mozart symphony, which is smaller and will be a more immediate and intimate sound.

If you’re recording a harpsichord you would be relatively close, because you’d sit close to a harpsichord in a large living room or in a very small hall. If it’s a grand piano you don’t want to be that close, maybe a bit further away; and if it’s an opera I think you’d want to be as close as possible, to be able to be involved in the dramatic action; then we really use a lot of the stereo image and the depth to get all the vocal and dramatic effects.

You are making a translation of one medium - reality - into another medium, stereo image. What I like to do is give the illusion of it sounding like the best concert hall position for that sort of piece. I go for the whole spread between the loudspeakers as the stage front, so I don’t like a very narrow image in between the loudspeakers. What I like is to take full advantage of all the width, it is of course a matter of taste, depending on how you like to listen to the performance. It’s not only up to me, it’s also up to the artist; the artist is doing his performance, and as well as deciding how he’s going to perform he can also have a say in how he wants it to come over. If he feels he sounds too far away, and I can agree with that, I can change it. Or the other way round.

NK It sounds like hard work.

EG Sometimes it is very difficult, if you want real perfection, but it’s really exciting. It’s hard work for the performers! But it’s beautiful music, and we have great singers and a great orchestra playing it. I’m sure it will be a wonderful recording when it is completed.
It is perhaps on time that I introduce the most important Audio Note product, the Audio Note cables.

Without the Audio Note silver wires and cables, none of the qualities of the Audio Note products would be possible. The ONGAKU has several kilometers of 99.99% pure silver wire in its output transformers, the Audio Note Iolitv and Iolitd cartridges have a few centimeters of the same wire, and the wire contribute, in both cases to a great deal of the sonic qualities that both these outstanding products possess, the wire is as integral and proprietary a part of each design, just as silver is central to the total Audio Note philosophy.

Audio Note was the first company in the world to realize and demonstrate that the cable materials and their manufacturing processes affect the sound quality of a hi-fi system. In doing so Audio Note were also the first to see the benefits of pure silver wire (99.99%) and as such are the originators of audio cables as a science.

Audio Note have since then gained a totally unique knowhow in the art and science of making audio cables and wires that perform far above their price range, regardless whether they have silver or copper conductors.

**AUDIONOTE SILVER CABLES.**

The first Audio Note audio interconnect cable, the AN-V, was designed in 1974, and offered to audiophiles and music lovers in Japan. As it was produced in very small quantity and only in late 1978 did the AN-V reach Europe. In 1985 the AN-V was joined by the AN-S silver cable, which is basically a downscaled AN-V, its production was, and therefore cost, reduced through the use of less critical materials. The original AN-V remained unchanged until mid 1989, when it was replaced by its current version. The AN-V was replaced at the top of the Audio Note cable range in October this year by the AN-Vx reference, which is the culmination of several years study into all aspects of cable design, suffice to say that all who have heard it agree that it has the most amazingly uncluttered sound they have ever heard.

Audio Note introduced a silver speaker cable in 1979, dubbed the AN-SP. It was unavailable for a considerable time during the 1980's and was reintroduced in 1988 followed by a substantial order from Peter Qvortrup.

A fully silver wired system has yet to be assembled here in the UK, although that should happen sometime in 1992, but for every part of the system where copper wire or cable is replaced with Audio Note silver wire or cable the improvement is always immediate, but don't take my word for it, try for yourself, using our no-nonsense 14 day try-before-you-buy offer.

Audio Note silver cables fall in the following price categories,

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<th>Interconnects</th>
<th>Price</th>
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<td>AN-S</td>
<td>110.00/m terminated</td>
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<tr>
<td>AN-V</td>
<td>175.00/m terminated</td>
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**Speaker cables**

| AN-SP         | 110.00/m per channel |
| AN-Vx         | 485.00/m terminated |
| AN-SPx        | 350.00/m per channel |

Termination of speaker cable costs 16.00 per set with either gold 4mm banana plugs or spades.

Using the purest available silver as a conductor, naturally has the same effect on price as it has on sound quality, it is automatically high.

**AUDIO NOTE COPPER CABLES.**

The desire to offer some more affordable cables in the Audio Note range as well as ultimate ones, made Mr. Kondo start an investigation into the use of copper wire in audio cables in 1983.

One problem with copper wire is that when it is produced, it is not normally coated immediately after it is drawn and the wire therefore oxidizes before it is coated. The copper wire therefore develops clusters of copper oxide crystals on its surface, which generate a rectifying effect (this is the reason why so many copper and silver cables sound best in one direction, which is the direction where the rectifying effect is the smallest!). This rectifier effect is present in all copper cables, regardless of whether they are oxygen or hydrogen-free or have single crystal structure or not, unless they have been coated immediately upon leaving the die.

If you try to solder a copper wire where an oxide film has formed the solder will not stick without flux, the oxide layer also has a hardening effect on the wire itself. Low level electrical signals are not able to pass easily through the oxide film on the surface of the wire and this worsens an already existing problem in copper wire. The cohesion between crystals in copper is quite poor, and if you stretch a copper wire it breaks relatively easy, this lack of flexibility is caused by weak crystal boundaries. This weakness in the contact between the crystals creates a fairly high "electrical wall" between crystals, which disables small signal transfer between crystals, as the electrons have difficulty passing the "wall."

This is the reason for the continued attempts by many manufacturers of cables and copper wire to make copper wire with long crystals.

The emergence of oxygen-free copper likes OFC, OFHC, PCC etc., made it possible to design cables around better quality wires provided the wires were manufactured to the right specification.

As a result the first Audio Note audio cable with copper wire, the AN-C (red), was launched in mid 1985, it shared most construction details with the original AN-V silver cable as it was twin cox, with symmetrical conductors, in a heavily damped double jacket.

The copper wire used was an OFHC, 99.99% pure copper, drawn in true Audio Note tradition through a diamond die and coated immediately after the die with six coats of polyurethane to prevent any oxidation forming on the surface. After six years the AN-C is still available and was joined by the AN-A, yellow, in 1989, both these cables represent exceptional sonic value at a very modest price.

In 1990 the first Audio Note copper speaker cable, the AN-E, was designed. This speaker cable incorporated a number of new ideas, partly to reduce cost without sacrificing sound quality, but also to incorporate reduced RF interference problems—what a silver cable does not have. (This was confirmed by Peter Qvortrup, who first heard the AN-E.)

The two main problems in speaker cable are caused by the amount of current passing through the cable, this firstly creates considerable "magnetic distortion" in the wire itself, more so in copper than in silver, regardless of copper type and cable design. "Magnetic distortion" is always accompanied by "wire crying", which is a resonance in the surface molecules, this is caused by a weight change in the molecule itself, as the electrons pass. As copper has higher DC resistance than silver, the electrons affect the molecule mass more, with increased "wire crying" as a result.

Secondly, the low frequency content of the signal always leaves an amount of mechanical energy behind, which "smears" the signal following, mainly concealing the low level content of that signal.

To combat this phenomenon, Mr. Kondo chose to use two thicknesses of wire for the AN-B, with the thiner wires bundled tightly at the center of the cable, surrounded by thicker wire bundles on the outside, all very tightly compounded in a vinyl jacket. This provides an efficient and inexpensive damping system (damping by differential masses), which reduces inter-conductor resonance by more than 80%, because the different gauges of wire will damp each other as they have different resonance frequencies.

The vinyl jacket is surrounded by a screen, which allows AN-B to be used in a pseudo-balanced mode to reduce incoming RF interference.

To further allow the use of Audio Note quality speaker cables in lower priced systems the AN-D was introduced only a month ago, being a derivative of the AN-B it uses the simple and effective damping arrangement of this Audio Note cable, as well as most of its qualities.

So today Audio Note offers the following audio cables with copper wire,

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<thead>
<tr>
<th>Interconnects</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>AN-A</td>
<td>25.00/m terminated</td>
</tr>
<tr>
<td>AN-C</td>
<td>49.50/m terminated</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Speaker cables</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>AN-D</td>
<td>6.99/m per channel</td>
</tr>
<tr>
<td>AN-B</td>
<td>12.50/m per channel</td>
</tr>
</tbody>
</table>

It is strongly recommended to buy the AN-B in terminated sets to achieve the full benefit of the pseudo-balanced configuration. Termination cost per set with high quality gold plated 4mm banana plugs, 16.00.

Apart from their quite superior sound quality, the AUDIO NOTE cables are very flexible, so if you are tired of the "hosepipe" technology most other manufacturers use, you will be relieved to connect up a set of AUDIO NOTE interconnects or speaker cables, they are flexible and will not pull your speakers off their stands or your amplifier or CD player off its shelf.

Furthermore there are copper or silver wires and cables available for rewiring tone-arms, amplifiers, loudspeakers, most speaker coils, inductors, winding transformers etc., for general systems upgrade and improvement. I should say, however, that these are not available under our try-before-you-buy scheme.

If the above has wet your ears "appetite" then perhaps you should use our try-before-you-buy, guaranteed money back scheme, which allows you to try any standard length interconnect or speaker cable for 14 days and if not satisfied return it for a full refund, all it will cost you is the postage one way.

Peter Qvortrup

AUDIONOTE COOPER & SILVER CABLES

Audio Note Co. Brighton, UK, 0273 821371, Fax 0273 771808.
Five Fifteen From Leeds

The latest 515 loudspeaker from Wharfedale in Leeds caught by Alan Sircom.

**Measured Performance**

The frequency response of Wharfedale’s 515 has a fairly broad dip of around -2dB in it, extending from 1kHz up to 6kHz or so. After which output starts to rise continuously to a peak at 15kHz, produced by the tweeter. Effects of this magnitude, seen quite clearly in our frequency response analysis, will make themselves known subjectively. I would expect some loss of detail and possible warmth or blandness to be produced by the dip, whilst the tweeter peak will make for thin or sharp treble. Unfortunately, there’s no escaping these characteristics until the response is flattened; altering matching equipment will do little to help for example.

The 515 has a series input capacitor to block sub-sonic signals, which makes the impedance rise to infinity, shown by the height of the trace at left in the impedance plot. This is usually done to prevent excessive low frequency cone excursions and block possible DC inputs from faulty amplifiers. It effectively decouples the loudspeaker from the damping effect of the amplifier at low frequencies however, so it is of arguable merit. KEF use the technique on some of their budget speakers, to assist bass tuning too. The overall impedance is high over most of the audio band, dropping below 8 ohms above 7kHz. Falling energy levels in music should ensure that not too heavy a current is pushed into the loudspeaker at these frequencies, unless very high levels are used with Rock music.

Sensitivity measured 85.5dB sound pressure level for a nominal watt input (i.e. 2.8V), a relatively low value for a budget speaker that may be partnered with amplifiers of limited output. For high volume without distortion, a reasonably powerful amplifier of at least 50watts per channel is best used.

With its uneven frequency response in particular, I have quite strong reservations about this loudspeaker. Only listening tests can determine whether its measured problems will be subjectively acceptable or not however.

**Frequency Response**

-5 dB 0 dB 5 dB

<table>
<thead>
<tr>
<th>Frequency</th>
<th>50</th>
<th>100</th>
<th>200</th>
<th>500</th>
<th>1K</th>
<th>2K</th>
<th>4K</th>
<th>8K</th>
<th>16K</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 Hz</td>
<td>+5</td>
<td>-5</td>
<td>-5</td>
<td>-5</td>
<td>-5</td>
<td>-5</td>
<td>-5</td>
<td>-5</td>
<td>-5</td>
</tr>
<tr>
<td>1000 Hz</td>
<td>+5</td>
<td>-5</td>
<td>-5</td>
<td>-5</td>
<td>-5</td>
<td>-5</td>
<td>-5</td>
<td>-5</td>
<td>-5</td>
</tr>
<tr>
<td>10000 Hz</td>
<td>+5</td>
<td>-5</td>
<td>-5</td>
<td>-5</td>
<td>-5</td>
<td>-5</td>
<td>-5</td>
<td>-5</td>
<td>-5</td>
</tr>
</tbody>
</table>

**Impedance**

-50 0 5 10 15 20 ohms

<table>
<thead>
<tr>
<th>Impedance</th>
<th>20</th>
<th>200</th>
<th>500</th>
<th>1K</th>
<th>2K</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 ohm</td>
<td>46</td>
<td>35</td>
<td>30</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td>1 ohm</td>
<td>36</td>
<td>25</td>
<td>20</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>5 ohm</td>
<td>12</td>
<td>9</td>
<td>7</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>10 ohm</td>
<td>6</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Wharfedale seem to have tried hard to make their 515s as inoffensive as possible and in so doing, they have squashed some of the enjoyment that existed out of the older 505.2. They do not have any major faults that can be pointed at in their performance; those I have mentioned above are comparatively minor. Unfortunately, apart from their pleasant nature and even temperedness, I can find little that sets the new Wharfedales apart as exceptional.

My recollection of the main fault in the 505.2 was the characteristic spittiness from the metal dome tweeter. So far, few designers have found a way to overcome this spitty sibilance. To its credit, the 515 fares better than most. There is still a trace of sibilance, especially on close-miked rock vocals, but on the whole the tweeter still maintains the speed and clarity of the metal dome, without its problems.

I feel that time has been harsh to Wharfedale. This design, had it been released five years ago, would have been truly world-beating. Today, however, there are many designs in this price range that make its virtues unexceptional. The 515 is in no way a poor loudspeaker; it has failings, but these are relatively minor when set against its overall performance. Unfortunately, there are also many other loudspeakers in this price range that have at least as much and arguably more to offer.
NOT CONVERTED YET?

Audiolab’s £695 8000DAC Digital-to-Analogue convertor greatly impressed our Eric. Musically, he felt that “the whole performance appeared clearer” and that it “invested orchestral music with subtlety and uncoloured tone.” He also found that it was “extremely sweet and delicate”, “calmly revealing” and concluded by saying that “the 8000DAC will certainly be a long-term pleasure.”

ENTRY FORM

1. What is Audiolab’s popular integrated amplifier called?

2. Does the Audiolab 8000DAC use a Bitstream or multi-bit processor?

3. Including the 8000DAC, how many products are in the Audiolab range?

Tie-breaker: Describe, in not more than twenty words, how the Audiolab 8000DAC would benefit your system. The more imaginative, the better.

Name: ____________________________
Address: __________________________
Postcode: _________________________
Daytime tel no: ____________________

Please send your entry form, completed in block capitals, by the 24th April, to Audiolab Competition, Hi-Fi World Magazine, 64 Castellain Road, Maida Vale, London W9 1EX.

For the winner of this month’s competition, there will be extra helpings of pleasure, as their Audiolab 8000DAC will cost about the same as a Mars Bar; 24p in stamps to be exact.

Please send your completed entries, by the 24th April, 1992, to the following address:
Audiolab Competition, Hi-Fi World Magazine, 64 Castellain Road, Maida Vale, London W9 1EX

We will endeavour to publish the results in the July Issue. Audio Publishing Ltd. reserve the right to publish such entries or parts of entries as the company sees fit. No correspondence may be entered into as regards this competition and the Editor’s decision is final. Employees of Cambridge Systems Technology, their dealers, and employees of Audio Publishing Ltd. are not eligible. All entries must be on the original forms, photocopied entries cannot be accepted.

The winner of our Tannoy competition, who wins a visit to Tannoy’s factory, will listen to the massive Westminster Royals and then bring home a pair of Tannoy 603 loudspeakers, was Colin Berresford, of Wigan in Lancashire. His reply to the tie-breaker “What do you think Alan might have said to Noel when the volcano erupted?” was:

“Hmm... not bad. But in the circumstances I think the Keywood be to turn the horn the right way up!”

We hope to bring you pictures of the visit in the next issue.
WIN AN AUDIOLAB 8000DAC DIGITAL-TO-ANALOGUE CONVERTOR
The SME IV is the best pick-up arm in the world. Probably. I don’t dare repeat SME’s slogan without adding a Danish rider. However, I am brave enough to say that this arm is outrageously good at its price.

At £827.67 (inc VAT) it’s not cheap but, for many people this is the last tone arm they will ever buy.

Not only does it perform to perfection it is also that rarest of rarities - the beautiful Hi-Fi product. With a silky sheen to the satin chrome finish and smoothly rounded form the SME IV is a piece of very sexy engineering that reaches standards set by Swiss watches.

I couldn’t wait to find out whether it sounded as good as it looked and, beauty deserving beauty. I decided to match the SME IV to the equally gorgeous John Michell Girodec.

**Sound Technique**

It didn’t disappoint. In fact the mid-range clarity, sweetness, detail and subtlety was nothing short of astounding. It gave the Academy of St. Martins’ production of Vivaldi’s Four Seasons the crispness of CD projecting the strings and Principal Violin with pin-point accuracy, although such precision and lack of vinyl warmth may be a bit off-putting for some tastes.

On the other hand the SME IV gave...
In listening tests constant comparisons between vinyl and CD was distinctly disturbing. Differences between the two were unexpectedly minute and in the degree of depth and recorded ambience these differences were all too often advantageously on the side of good old-fashioned vinyl.

Care was taken to compare like with like. Rather than an earlier pressing a digital remaster in its remastered form was put on the turntable. Early mint pressings of the 50s and 60s had a frightening master tape quality. All courtesy of the SME IV.

**Superior Function**

One of the functional delights of the Gyrodec I was using with the SME is that the arm-plates are machined to match the weight of the arm they are destined for so no fiddling of suspensions is necessary.

Fitting was simplicity itself. No wooden plinth to drill, no arm-board to measure, no fusing over arm-lead dressing.

As a result I didn’t need SME’s arm-mounting template but it, and the first two paragraphs of the instruction manual are so straightforward that it shouldn’t pose any problems. In fact, I double checked it with a Thorens arm-board to ensure it really worked. It did.

Altogether the instruction book is a paragon of lucid clarity. It has to be. The SME IV is constructed along quite different lines to most other tone-arms, especially when it comes to some of the methods of adjustment and alignment.

The writers of the manual have employed the sly clever trick of numbering all the paragraphs from 401, the Series V manual beginning with 501, so there’s no possibility of getting the wrong manual in your hands.

A black and white photograph accompanies every stage of the fitting process which is designed as a start-to-finish series. Should you wish to change the arm height later for a different cartridge remember that the base has to be unlocked.

Apart from its finish the SME IV is, at first glance, indistinguishable from its more expensive sibling. However, there are one or two major differences.

On the Series V Vertical Tracking Angle is adjusted on the top and with a little care and a turntable that isn’t too bouncy it can be adjusted during play. This facility is a little less accessible on the IV. The damping arrangement on the V has been omitted altogether although one is available for £125.86 (inc VAT).

The arm-tube uses the same magnesium alloy construction with a fixed headshell like the Series V but the bearings are made to lower tolerances - AEBC 7 rather than AEBC 3 standard. Even that is well beyond most other arms on the market. Even for a reviewer who is constantly changing cartridges and thus putting bearings under stress this one is extremely hardy and difficult to damage.

In short, if the Series V is incredibly over-engineered the IV is simply over-engineered.

Other differences include the use of OFC internal wiring and arm-lead in the IV as opposed to Silver Litz and Van den Hul arm-lead. Both are available as options which takes the IV’s price up by a further £50 or so. If your preference is for black chrome finish instead of standard satin that, too, is available for a further 15% hike.

**Alignment**

Setting up is simplicity itself. All the tools are provided. A tiny thumbwheel in front of the low slung counterweight shifts it smoothly back and forth for arm balancing.

Two black lines running along the arm are more than a designer’s conceit. They allow alignment fore and aft to a precision of within a quarter of a millimetre. If your eyesight is that good!

There are no weight figures on the arm for setting the tracking force. Instead, one of four letters give a starting point and one revolution then equals 0.5gm tracking weight. Bias is set by a thumbwheel on an outrigger marked in 0.1gm divisions.

The whole process using SME’s alignment protractor took less than five minutes. I can’t think of an arm more simple to adjust.

All in all, like the Gyrodec it lived on, the SME IV’s sexy chassis combined with its staggering engineering quality and potent performance should earn it a hallowed place in the Design Centre.

The best tone arm in the world? Most probably.
Some great claims have been made in the past on the subject of cartridge alignment. The right cartridge position, according to some American critics, radically improves sound quality. Others are more reserved about the apparent improvements.

I believe they depend upon the state of the system before it was adjusted. So, predicting just how large any change might be is impossible. It will vary from system to system. Generally though, it is my experience that a correctly aligned cartridge has a smoother, more confident sound—especially on inner grooves—than one misaligned.

Cartridge alignment reduces what is commonly called ‘lateral tracking error distortion’. This effect is produced by the cartridge following a different path to the cutter that made the record in the first place.

The result is an angular error relative to the groove, which is the source of the distortion. The problem is especially bad on inner grooves and because of this it has been common to try and minimise tracking error at this point alone.

The usual solution is to design an alignment gauge (protractor) with one point on it, positioned 58mm from the centre of the platter to correspond with the innermost groove of an LP. It’s a simple and reasonably effective device, although some are slightly inaccurate due to misunderstandings about what exactly is required.

Our alignment protractor has been designed to be more precise and informative than the simple ones. It has the usual ‘inner groove’ alignment point, but this has been optimally positioned in accordance with a geometric analysis of arm behaviour, to lie at a particular point just before the final groove.

This minimises distortion right across the disc, giving a more balanced result from start to finish.

Ordinary protractors that align at the final groove cause more distortion before it is reached and more at the very start of a record. Ours keeps distortion down right across the record.

Another feature of our protractor is the ‘outer zero’ point. A well-designed arm should also line up properly here. The addition of this point on the protractor allows you to check whether this is the case and whether your arm is set to perfection.

If it is, you will be getting the lowest possible distortion from tracking error right across the disc, from start to finish. It will give you the very best sound from your turntable.

* J.K. Stevenson: Wireless World, May 1966

how to use your free alignment protractor

Cartridge alignment improves the sound by reducing distortion. Our protractor gives the best alignment possible.
1) Loosen cartridge mounting screws just enough to allow it to slide forward or backward.

2) Place protractor over centre spindle of turntable

3) Place stylus on inner zero point

4) Move cartridge forward or backward until the edge of the headshell that is parallel to the cartridge axis is also parallel to one of the headshell side alignment lines. If neither side is parallel to cartridge axis, use front of headshell.

5) The cartridge is now in the correct position. Make sure it is not skewed, then tighten the screws firmly.

6) You can now check arm geometry by placing stylus on 'outer zero'. The side of the headshell parallel to the cartridge axis should also be parallel to the alignment lines.

**FURTHER ADJUSTMENT**

If your arm doesn't line up on the outer zero, after the cartridge has been carefully and correctly set on the inner zero, its geometry is not ideal. It is possible, albeit a bit tricky, to make some fine improvements.

First, after alignment on the inner zero, find the point close to the outer zero where the headshell is parallel to the alignment lines. If it is, say, 6mm closer in toward the centre spindle (i.e. at 120-6 = 114mm radius), halve the 6mm figure (i.e. 3mm) and move the inner zero adjustment point in by this amount. Since our inner zero is 64mm from the platter centre, moving in 3mm will take it to 61mm.

Re-align the cartridge at this new inner zero. Now it should line up closer to our outer zero, lessening distortion on outer grooves in particular.
Where you can choose from the best in hi-fi.

MARANTZ, A&R, MUSICAL FIDELITY, SD ACOUSTICS, DUAL, ROTEL, AUDIO TECHNICA, GOLDRING, QED, TARGET, HEYBROOK, KEF, RUARK, WHARFEDALE, ARISTON, ROKSAN, CHORD COMPANY, MOTH, INFINITY, NAKAMICHI, REVOLVER, PINK TRIANGLE, ALLISON ACOUSTICS, DYNAVECTOR, EQUINOX, YAMAHA, PIONEER, SME ... and many more.

A small, friendly Hi-Fi shop, specialising in personal service — home demonstrations and free delivery anywhere within the M25 radius. Personal demonstration room at the shop.

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TEL: 081-534 6987
OPENING HOURS 10.00 – 7.30
We tested the Linn Kremlin against the Naim NAT-01 using both broadcasts from around the dial, together with broadcasts made from our own generator. Listening to an afternoon play on Radio 4 one could hear a studio, together with people standing behind microphones on the Naim. On the Linn tuner, however, this studio appeared to fall away, pushing the performers forward. There was little sense of depth, and a limited amount of ambience or space around the performers when compared to the Naim. In addition, the Kremlin had a noticeably brighter tonal balance probably due more to its tailored bass, rather than actual brightness; the BBC's beach sound effects were barely noticeable on the Kremlin, but clearly apparent on the Naim.

Changing stations, we noticed that the Linn had far greater pulling power than the Naim. It produced a stereo signal from France Musique, albeit a poor one, where the Naim could not. Moving on to stations closer to home, on Radio 3 the Kremlin’s mid-band sounded engaging at first. Further listening suggested that it is rather two dimensional, muddling spatial details. The Naim produced depth that gave the orchestra perspective; on the Linn there was less delineation between instruments from either a tonal or spatial viewpoint.

Along the dial, on Radio 2, the Linn fared less well. Gloria Hunniford was playing a selection of film tunes, one of which was from Camelot. Here, the Naim accurately portrayed the distinctive light tenor voice of the late Sir Rex Harrison, while on the Kremlin, we were unsure as to who it was singing, but felt that it could have been James Robertson-Jones. Worse still, it was impossible to determine exactly where this baritone voice was coming from, while the image the Naim

**Comparison of Measured Performance**

The tune resolution and accuracy of both tuners was superb, repeatedly giving optimum results in terms of distortion and channel separation. I found from tests. Although arguments can be made for either system, differences in this particular case were insignificant.

Both tuners have a flat frequency response, but the Naim reaches down to 5Hz whilst the Linn is limited to 60Hz, something that proved to be audible.

The Linn had better channel separation but Naim’s was good at high frequencies and very respectable in the mid-band. Since anything over about -25dB gives a good enough rendition of stage width I would hesitate to make value judgements here.

Both were low distortion tuners, there being little difference between them. The Linn was extremely quiet (-79dB hiss) when given enough signal (2mV), whilst the Naim 01 was satisfactory (i.e. hiss was just about inaudible during Radio 3 silences) with its -73dB figure, given 1.6mV or more.

Both tuners suppressed spurious multiplex signals well, so recording from either should not raise problems.

**Test Results**

<table>
<thead>
<tr>
<th></th>
<th>LINN KREMLIN</th>
<th>NAIM NAT-01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency response</td>
<td>60Hz-15.6kHz</td>
<td>5Hz-15kHz</td>
</tr>
<tr>
<td>Stereo separation</td>
<td>-66dB</td>
<td>-43dB</td>
</tr>
<tr>
<td>Distortion (50% mod.)</td>
<td>0.25%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Hiss (CCIR)</td>
<td>-79dB</td>
<td>-73dB</td>
</tr>
<tr>
<td>Signal for minimum hiss</td>
<td>2mV</td>
<td>1.6mV</td>
</tr>
<tr>
<td>Selectivity</td>
<td>80dB</td>
<td>72dB</td>
</tr>
<tr>
<td>Sensitivity mono</td>
<td>1.3µV</td>
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<tr>
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<td>40µV</td>
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<td>signal strength meter</td>
<td>digital readout, 0-120dB</td>
<td>none</td>
</tr>
<tr>
<td>relative to 1µV</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

After testing Linn’s new Kremlin (see page 16) we were keen to compare it to its closest rival, the Naim NAT-01. Eric Braithwaite and Alan Sircom spent an afternoon comparing the two tuners.

It was in RF performance that the Kremlin pulled ahead and this I suspect is a mixed blessing. Whilst the extra stages improve sensitivity and selectivity, they probably act to compromise sound quality. This is why I said the Kremlin might benefit from having switchable RF and IF stages. However, it can pull in weak stations and separate weak from strong very well. It also has an excellent signal strength meter.

The Naim 01 has good selectivity at 72dB. Stereo channel blending and loss of amplitude limiting below 10µV conspire to make measurement of sensitivity impossible but the 01 is less sensitive than the Linn and many other tuners. Naim are aware of this. They wisely insist it is used with a high performance aerial, which can easily counteract such weaknesses. The Naim does need and should have a signal strength indicator, even if it is only a green LED that lights when the aerial signal exceeds 1.6mV, something that Arcam once used.

Both Kremlin and 01 are high performance tuners that work very well. Naim put the accent on sound quality, sacrificing RF performance. Linn put the accent on overall sophistication; the Kremlin is highly complex but they pay a price in sound quality I believe.

produced was firmly located between the loudspeakers.

Finally, we compared tracks from CD through our own stereo VHF/FM signal generator. The Linn spread everything far and wide, making a violin seem especially large, as was Mary Black’s mouth. In addition, the Linn’s sense of ambience was only so-so. On the Naim, however, it was far nearer the original CDs that we used.

The Linn Kremlin has a distinctive tonal character that may suit Linn-based systems. However, outside of that tight parameter, it does not perform as well as one would expect and hope from so expensive a device. The ‘Naim NAT-01 is also an expensive tuner, designed to fit within a tightly specified system; it is also, however, just as successful outside of a Naim system. This must surely be the test of a good tuner. Unfortunately, by that criterion, the Linn fails to come up to the mark.
DENON are one of the few companies not caught up in the onrushing tidal wave of Bitstream. The £560 DCD-2560 is a multi-bit Compact Disc player with a claimed twenty-bit resolution. In outward appearance it is an associate of players like the Marantz CD-94, with the more infrequently used controls tucked away behind a "trapdoor", as the handbook charmingly calls it, covering the lower third of the machine.

**perfect pitch?**

**Denon's DCD-2560 Compact Disc player allows the listener to change the pitch of a recording, Eric Braithwaite wonders if it is perfect.**

There is quite a complex array of controls on this CD player. The upper part is all fairly straightforward: Power On to the left of the disc drawer, the normal track search and play controls to the right of the display. Behind the flap (O.K., Denon, "trapdoor" if you must) are the 0-9 track programming buttons with a +10 for the higher numbers. Here also is the dimmer switch for the display, which has three levels of brightness and none whatsoever (i.e. off). Apart from the home taping aids of the Edit controls which allow CDs to be programmed to fit both A and B sides of the tape, the repeat and A-B functions, there are a couple of interesting additional wrinkles. One is a Link button which allows several CDs to be played through faster. It does, however, serve a more useful purpose. It is not unknown even for modern recordings to have been recorded slightly fast or slightly slow, and a number of people are sensitive to the consequent change of pitch. If you are a collector of older recordings made on shellac, 78s and transferred to CD, many have long parted company with the information about what speed they were recorded at. It could be anything from 76 to 82rpm, and despite trained ears, the end result is not always correct in pitch. The Denon can correct these as an owner thinks fit.

A full-function remote control is provided, and there are both fixed and variable outputs along with coaxial digital and optical connections.

Bright, clear and sharply etched was the first impression as the music came out of the DCD-2560. The power of the player to resolve some tiny details was well up with its peers, and sometimes way ahead, coming close to the £900 Marantz CD-94 MkII examined last month.

Do you want to hear a fiddler fidget? There he is, elbow on a creaky music stand. Are you irritated by discovering a clumsy engineering hand on the faders? There is a quick sweep over to the right on track one.

**Gimmick**

This might at first seem a gimmick, though everyone will probably have a mental list of music they'd like to get through faster. It does, however, serve a more useful purpose. It is not four. It's best to avoid those classical musicians who hum along and mutter as they play, for the Denon exposes them quite unmercifully. This is not a cold, clinical, fluorescent tube lit player, though. There is plenty of music that comes bounding out of it.

**Bebop**

The Denon DCD-2560 is very quick on its feet: Bebop comes over with plenty of bop. It is, sometimes, almost too speedy, and there is an area where its toes become mixed up with its ankles. Somewhere in the upper mid-range it has rather too sharp a way with transients. Listening to Prince's Diamonds and Pearls, which is where I noticed, for the first time, a sharp flick of the engineer's wrist on the mixing desk, it suddenly became clear that there was a degree of slurring on the triangle which pinged brightly, but perfunctorily. The drumming too became a little blurred. This was also the case with Miles Davis' Dingo. The trumpet shot straight up into the top frequency range, but the lower end of the drumkit had a muddy sound compared to the gleaming brass of the man's instrument, and cymbals sounded soggy against the horn's cleanliness. Both drumkit and backing to some interesting new filter variant, possibly digital, the transition from pass to reject, or the corner in the frequency response trace at 20kHz, is incredibly sharp. The phenomenon can be seen at far right in the frequency response analysis. Treble level remains high right up to the upper limit, all but guaranteeing a bright sound. The curious filter form that produced it may well have benefits, or drawbacks. I rather suspect Denon are grappling with some new technology here.

The measured noise level was incredibly low, but I suspect that muting was being applied at digital zero. There was little output of spurious rubbish above -20dB as well, which is always a good sign. It is thought (although it remains unproven) that unwanted high frequency signals produced by CD players can and do get 'folded down' into the audio band by intermodulation, with bad affect upon sound quality.

Channel separation was very high and output normal at 2.2V. The measured dynamic range is limited by the fact that distortion at -60dB was higher than usual, a factor which affects the particular Japanese (EIAJ) test I use.

The big Denon measures well, even if it isn't quite a match for current bitstream (or low-bit).

---

**Measured Performance**

For this player, Denon have abandoned Burr Brown as the converter chip manufacturer, moving their allegiances to Analogue Devices instead. Inside there are four AD1862 multi-bit chips, arranged differentially. The digital signal is split on each channel after conversion through twin chips (one per channel) to cancel distortion and noise. They give 20-bit resolution, using Denon's own Lambda technology.

In their hands they produce a curious measured performance. There are signs of non-linearity and resultant distortion at normal music levels, as our distortion analysis shows, where the 'spikes' are distortion components. What little distortion there is appears analogue-like, in that the harmonic levels are highest close to the fundamental and they progressively decrease with rising frequency. Although the overall level of distortion seen here is actually low, I am still a bit surprised that a Japanese company in particular has let it through on a reasonableness expensive and prestigious player. They must have some fairly compelling reasons for doing so.

At low levels, where distortion is often a problem on CD, the DCD-2560 turns out to possess very little distortion, relatively speaking. With a dithered signal in particular, it produced less than 1% of second harmonic at -90dB, which is an exceptional performance. So whilst the DCD-2560 isn't distortionless at normal music levels, like most modern low-bit players, it does have very good low level resolution.

This player's frequency response characteristic is even more unusual than its distortion residual. Presumably due to a Link button which allows several CDs to be played through faster. It does, however, serve a more useful purpose. It is not four. It's best to avoid those classical musicians who hum along and mutter as they play, for the Denon exposes them quite unmercifully. This is not a cold, clinical, fluorescent tube lit player, though. There is plenty of music that comes bounding out of it.

**Bebop**

The Denon DCD-2560 is very quick on its feet: Bebop comes over with plenty of bop. It is, sometimes, almost too speedy, and there is an area where its toes become mixed up with its ankles. Somewhere in the upper mid-range it has rather too sharp a way with transients. Listening to Prince's Diamonds and Pearls, which is where I noticed, for the first time, a sharp flick of the engineer's wrist on the mixing desk, it suddenly became clear that there was a degree of slurring on the triangle which pinged brightly, but perfunctorily. The drumming too became a little blurred. This was also the case with Miles Davis' Dingo. The trumpet shot straight up into the top frequency range, but the lower end of the drumkit had a muddy sound compared to the gleaming brass of the man's instrument, and cymbals sounded soggy against the horn's cleanliness. Both drumkit and backing to some interesting new filter variant, possibly digital, the transition from pass to reject, or the corner in the frequency response trace at 20kHz, is incredibly sharp. The phenomenon can be seen at far right in the frequency response analysis. Treble level remains high right up to the upper limit, all but guaranteeing a bright sound. The curious filter form that produced it may well have benefits, or drawbacks. I rather suspect Denon are grappling with some new technology here.

The measured noise level was incredibly low, but I suspect that muting was being applied at digital zero. There was little output of spurious rubbish above -20dB as well, which is always a good sign. It is thought (although it remains unproven) that unwanted high frequency signals produced by CD players can and do get 'folded down' into the audio band by intermodulation, with bad affect upon sound quality.

Channel separation was very high and output normal at 2.2V. The measured dynamic range is limited by the fact that distortion at -60dB was higher than usual, a factor which affects the particular Japanese (EIAJ) test I use.

The big Denon measures well, even if it isn't quite a match for current bitstream (or low-bit).

**Frequency Response**

<table>
<thead>
<tr>
<th>Frequency (kHz)</th>
<th>Response (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>+0.5</td>
</tr>
<tr>
<td>1k</td>
<td>-0.5</td>
</tr>
<tr>
<td>25kHz</td>
<td>-0.5</td>
</tr>
</tbody>
</table>

Flat frequency response with unusually sharp roll-off (at right).
technology. That doesn't necessarily mean it's any worse off for it, because the measured blemishes were small. Whether they are consequential in their affect upon sound quality only listening tests can tell. I had some reservations about certain features, the way treble level was maintained looked especially injudicious, I would say from past experience. Treble is more commonly rolled off these days.

**Test Results**

<table>
<thead>
<tr>
<th>Frequency response</th>
<th>4Hz-21kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distortion</td>
<td>0.004</td>
</tr>
<tr>
<td>-6dB</td>
<td>0.004</td>
</tr>
<tr>
<td>-30dB</td>
<td>0.02</td>
</tr>
<tr>
<td>-60dB</td>
<td>0.6</td>
</tr>
<tr>
<td>-90</td>
<td>27</td>
</tr>
<tr>
<td>-90dB dithered</td>
<td>1</td>
</tr>
<tr>
<td>Separation</td>
<td>left</td>
</tr>
<tr>
<td>1kHz</td>
<td>-118</td>
</tr>
<tr>
<td>10kHz</td>
<td>-93</td>
</tr>
<tr>
<td>Noise</td>
<td>-119DB</td>
</tr>
<tr>
<td>Noise with emphasis</td>
<td>-119DB</td>
</tr>
<tr>
<td>Dynamic range</td>
<td>105dB</td>
</tr>
<tr>
<td>Output</td>
<td>2.2V</td>
</tr>
</tbody>
</table>

**Distortion**

0.01%

Some distortion at normal music levels

vocals merged indistinctly with the rest of the band on a flat plateau across the stage. Oh, but that trumpeting - brisk, sharp, lively: for a while, I wondered if I had been unkind thinking it was not first-rate Miles. It was definitely - as far as the solo work went - more of a performance than a recording.

There's the rub, for this is a big, breezy player at its best, one that puts the centre of the stage in front. It doesn't, however, define the edges of the man in the middle very well. Centrally placed vocals and instruments have a tendency to spread laterally. At the edges, however, this is fine; it gives an illusion of a stage of considerable width. Orchestral music had similarly splendid real-world life, with good fat brass, the instruments all neatly shined up with Brass° and not a dent in them. Strings were dry and clean, though with less tonal differentiation between the sections than is desirable.

The Denon can be exciting, especially with analogue recordings, which are often softer than digital ones. This is the give-away, for this CD player is something of a hard case: all this life, speed and resolution is in the mid-range. On the way up, vocals and instruments acquire a glassiness that could only be cut by diamond, and the bass, though it's not dull and forgotten, while being full is also a bit fuzzy. It's a different picture if the DCD-2560 is used as a transport.

Piping the coaxial output into a Deltec PDM 1 converter improved matters enormously. Resolution wasn't so glazed over; timbre and tonalities were much more even and smooth. There was a distinct tightening up of focus, and a distinctly longer front-back perspective. The inner depth of the recordings became much more apparent. Even the bass was firmer, and like the overall sound simply more resolve. Here we suddenly had a transport which would have stood up well against the Kenwood, Teac and Arcam of last month's review. The solid building work which Denon have put into the machine pays off here.

The optical output was less successful, less taming. Though the depth perspective was retained, there was less of a defined shape to instruments or vocalists, the whole sounding more laid-back and still with some tonal and timbral muddle - especially in the middle ranges.

Perhaps it was the "Lambda" circuitry, the D/A processing which I have my doubts about, or perhaps it was the Analogue Devices convertor chips, for Denon normally use Burr Brown. Whatever, as a player bought with an eye to a prospective upgrade by adding on an outboard converter, this is one to put on the shopping list. As a stand alone machine, preliminary audition in your own system is strongly recommended, or its worst may get the better of its best.
Flying high

Hewn from Aerolam, used in aeroplane building, the Celestion 700SE is a top-flight loudspeaker, according to Eric Braithwaite.
in aluminium dome tweeter, with horizontal bars across the dome to protect it, since it is fragile, plus a 6 1/2 inch Cobex mid-bass driver. Some revision has taken place, however, internally, to make this loudspeaker, like the 100, a little more amplifier-friendly. The throw of the bass driver has been lengthened and the compliance of the surround has been altered. These changes should result in improved dynamic power handling and greater resolution at high levels; Celestion reckon. Changes in the crossover have been implemented, as in the 100s, to increase the "vertical window", especially useful as the stands come only in one height. Efficiency wasn't at the top of the design brief, so a good 100 watts or more is a healthy starting point in the choice of amplification.

Some care is required in positioning the 700SE's, but with the experience gained from using 100s I found their ideal position quite quickly. Users should not be afraid of keeping them unusually wide apart, nor necessarily of toeing them in at acute angles. It all depends on the distance of the listening seat. It is easy - much easier than with the 100s - to recognise when it is right: the music is wide apart, nor necessarily of toeing them in at acute angles. It all depends on the distance of the listening seat. It is easy - much easier than with the 100s - to recognise when it is right: the music is well separated, not lost in a large room.

Who said metal domes were spiny? Not "I am a Camera" so much as "lam me a Microphone!"

The 700SE's, though they don't claim low bass extension by any stretch of the imagination, have the knack of convincing the listener it is all really there. The 700SE's are well house-trained; it was never impossible to close one's eyes and get on with the music.

Not just the music, any music. These Celestions may have charmed me into submission, but I couldn't find fault. Well, perhaps I could, but since any quibbles are within the design envelope, it wouldn't be entirely fair. If there's a lack, it is - and this is something many small monitors have in common - that compared to the ATCs, large scale productions were somewhat diminished in size. It's the difference between having a life-size performer in front of you and a holograph. Correctly placed, though, the 700SE's presented a perfect miniature. It is something I have no problem in accepting for the sake of the detail and insight, the catches in a vocalist's voice and the sound of an instrumentalist taking one step back - and knowing for sure it was one step and not three.

Ambient information, which contributes so much to the sense of being there, was profound. I listened to a broadcast from St Albans; it's a few years since I was there, but the Celestions painted a vivid acoustic picture of the interior which I had no difficulty in visualising. A friend - a jazz fanatic - was startled to discover he could tell clearly that a solo trumpet had obviously been recorded acoustically separated from the drummer. That was the second time round - he was too emotionally involved in the performance the first time.

Celestion's design efforts have really hit a peak with this flagship of theirs. The 700SE's stand well up on the quality pyramid of small monitors. They are credible, analytical, musical, and the fact that they are boxes is forgettable. That's how it should be, and they have very few nays for what they do.

Only one thing they need to be well fed, both with power and high quality sources. Even the most modest budget or mid-price equipment will disappoint them. I just - though there was a sense of strain - achieved moderate listening levels with seventy watts, but they eased markedly with a hundred. They won't paper over any cracks, just tell the truth. They convinced me as much as their honesty would a jury. I plead guilty to falling in love with them, and I even forgot to apologise to my 63's for exiling them to the kitchen for the duration.

Some unevenness in frequency response

Impedance

The 700 is a hi-tech mini-monitor. Being from a large loudspeaker company with good research facilities, and who place quite a lot of emphasis on technology, it should have a good basic measured performance.

The frequency response isn't quite as flat as I would have hoped, in comparison to some other monitors I have measured recently, like B&W's impressive 805. The analysis shows that the bass/mid-range unit has slowly falling output with rising frequency, bolstered by a peak at 1 kHz. Above 3 kHz output starts to rise, probably due to the tweeter coming into play. Above 10 kHz a sharp notch, probably due to phase cancellation, removes most of the upper treble and I can't help suspecting that this has been used to prevent the tweeter sounding peaky and sharp, as result of its rising response traits.

The overall characteristic is reasonably well balanced overall, especially since the response analysis has a high resolution vertical scale, but this is not the smoothest trace I have seen all the same. Whilst with loudspeakers, a ragged or non-flat response doesn't necessarily damn them, a flat response is still prerequisite to real accuracy. The 700 is satisfactory as expensive monitors go, if not exceptional. Not unexpectedly, sensitivity proved very low. With mini-monitors, it often is in order to generate good bass. Barely 81 dB sound pressure level was produced for a nominal watts of input, partly because impedance is a very high 12 ohms overall. Most loudspeakers manage 85 dB or thereabouts under these circumstances, which is noticeably louder.

Whilst high impedance means the 700 underamplifying at a load, to get much volume from it a powerful amplifier is needed. I'm afraid there's no easy way for me to explain to you that a powerful amplifier is only needed to swing volts (think of volts as pressure) across the loudspeaker in order to get current to flow. High impedance loudspeakers are common enough, but they under-utilise amplifiers. The 700 would draw only 30 watts from a 50 watt amplifier, for example. I would suggest you use the 700SE's with 250 or 300 watts per channel would be sensible if reasonably healthy volumes are wanted. The impedance curve shows clearly that the 700 has a minimum impedance of 7 ohms, but it hits 35 ohms at 1 kHz and more at 60 kHz, which helps raise the overall value.

The 700 has some minor difficulties, ones that are not unusual however. They don't preclude good sound quality, but they do show that certain limitations exist. NK

Measured Performance

The 700SE's, though they don't claim low bass extension by any stretch of the imagination, have the knack of convincing the listener it is all really there. There are no wobbles, no uncertainties: bass guitar rolls around, timpani thwacks come over as startlingly sharp and apparently deep. It was profound. I listened to a broadcast from St Albans; it's a few years since I was there, but the Celestions painted a vivid acoustic picture of the interior which I had no difficulty in visualising. A friend - a jazz fanatic - was startled to discover he could tell clearly that a solo trumpet had obviously been recorded acoustically separated from the drummer. That was the second time round - he was too emotionally involved in the performance the first time.

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Some unevenness in frequency response

Impedance

High overall impedance, due to peaks
seventh heaven

Deltec's new PDM-I Series III digital to analogue convertor, with DAC 7 technology, inspires Noel Keywood.

The complexity of this convertor is reflected in the banks of rear panel optical inputs and outputs necessary for their interconnection.

The PDM-I Series III digital-to-analogue convertor from Deltec is their third model to possess Philips' latest Bitstream super-chip. In an attempt to gain the best sound possible from Compact Disc at various levels of sophistication, Deltec have positioned it between the technologically extravagant PDM Two costing £2200 and the more accessible Bigger Bit costing £650. PDM I Ill neatly combines much - but not all - of the complexity of the former with a price that is, perhaps, a bit more affordable at £1195 (well, all things are relative).

Whilst differences between high quality digital convertors couldn't be described as great, in the same way that loudspeakers differ from each other, I find that they have a lot of effect upon the way I feel about listening to music from CD. It is, I suspect, the peculiar feature of Compact Disc, where the sound can still display elements of unpleasantness that is responsible. For example, a small treble lift in the frequency response of a CD player produces a sharp, incisive quality that spits at your ear and seems almost to want to pierce it.

These days, treble peaks from poor filter design or termination rarely exist, but the example is appropriate. CD can so easily sound unpleasant that an increasing number of manufacturers now introduce small response tweaks to ensure it never strays in this area. Convertor design hovers on the brink: too far in one direction and the sound will become intolerable. Too far in the other and it will start to lose its basic CD attributes of clarity and insight. The balancing act is intriguing and the outcome at times exciting.

Deltec's own PDM Two is the most exciting convertor I have heard. It took a firm and obvious step forward within the precariously fine limits of acceptability I have mentioned. It was fascinating to hear how Philips' latest chip-set could improve the sound of Compact Disc, especially since it represented the most complete and successful about-turn in attitude from the inventors of the medium. In a nutshell, PDM Two offered a sound with drama in it. There was a stronger dynamic, a greater sense of precision and control and a much enhanced delivery at spectrum extremes; bass came through with real slam, treble with shattering strength.

I found PDM Two ruthless and bordering on violent. I had expected to be presented with increased refinement. It was there too, in terms of improved insight into a performance. What I hadn't reckoned on was the 'press you back in your seat' type of assault by sound that comes with this new chip set, at least when well applied.

Bigger Bit possesses some of the character and ability of PDM Two, but not a lot of its composure and expansiveness. I was impressed by Bigger Bit, but a little perplexed too. We are still talking about it in the office. Eric independently reached the same conclusions as myself, namely that it has unusual amounts of punch and focus in contrast to other convertors - an attribute of DAC7 - yet it also has a slight upper mid-range glare that compromises tonal neutrality. In consequence, Bigger Bit has turned out to be something of an enigma to us. There's no equal at the price and you can't ignore its unique and captivating strengths, yet the evenness of nature that some other convertors display isn't there.

Obviously, there's a gap waiting to be filled here and PDM I Series III fills it well. Like PDM Two, it is a two box
unit. The idea is to capitalise upon the basic configuration of the Philips chip-set, in order to best exploit its properties. A lot of manufacturers made mistakes with Philips’ latest top quality Bitstream chip, the SAA7350. It is very layout sensitive and, although Philips supply manufacturers with a recommended layout and an advisory service, the success rate for its application has been patchy.

Philips leapfrogged the difficulties with DAC7. It is a peculiar ancillary chip to SAA7350, for it merely houses some of the same circuits, so they can be removed from the heat of the kitchen, as it were. This cuts out problems of mutual interference. Ideally, the division is capitalised upon most effectively by putting the new chip in its own screened metal box, as in PDM Two. Since metalwork these days costs much more than silicon chips, it is also the most expensive option, hence the single-box Bigger Bit.

PDM I Series III uses a two-box arrangement, like PDM Two. What it lacks are the electronic frills. A lot of the highly specialised reference power supplies of the Two are missing and eight-times (oversampling) digital filtering is used, against sixteen-times. In all, mainly because the power supplies are less comprehensive. PDM I III has around one-third the number of components in it than PDM Two, yet all the basic circuit configurations are identical. This even extends to use of specialised output circuits designed exclusively for high quality audio work by Deltec. Where nearly all other manufacturers are content to use silicon chips costing around 40p to handle the audio, Deltec totally reject them at this price level. Instead they use their own thick film hybrid circuit, the DHOA32, seen as vertical ‘daughter’ cards on the mother board in our picture.

So PDM I III contains much of the essence of PDM Two, including the ability to mate with a Deltec transport (in development) which itself will work from the master clock within the converter itself.

The digital box connects to a transport via an optical cable or an electrical cable and is itself linked onward to the ‘anologue’ box through no fewer than four optical cables. This amounts to quite an impressive skein of optical cabling. Two carry the high speed Bitstream digital signal for decoding (left and right), one carries a de-emphasis control signal and one a clock signal. The audio outputs are via phono sockets; there is no method of varying output level. It is fixed at the CD standard of 2V nominal, in this instance measuring 2.3V.

Ideally the two cases of this convertor should not be placed immediately on top of each other; but they could be racked vertically beside the transport, or even hidden away somewhere. They are best left powered up; the power switch is on the rear.

There is very little to say about the general operation of PDM I III. Both units are sturdy built out of aluminium alloy, the front panels being cast. Deltec apply a dark grey gloss paint finish and a single green light glows when power is on. I experienced no unusual problems. Power is supplied through IEC inputs and, ideally, Deltec mains filters should be used in each line.

Sound quality from PDM I III was surprisingly adeptly placed, in subjective terms, between PDM Two and Bigger Bit with, in my opinion, a slight bias toward the former. It possesses all the expansiveness, the ease and strength of bass delivery and the occasional shock of powerful treble, that Two displays. However, it is less hard edged and precise in what it does, in both timing and transient definition. This made PDM I III a bit less remorseful and brutal in its delivery, which I found no bad thing. Yet at the same time it retains all the strengths of PDM Two, offering a punchy and dynamic sound from CD, with little of the smoothness and slightly self effacing presentation that Bitstream has offered to date.

The glare and the slight imprecision of timing and general presentation that Bigger Bit displays in contrast to PDM Two (but not other non-DAC7 convertors) was not evident. I felt that PDM I III was quite a step up from Bigger Bit in fact, offering all the same good points whilst avoiding the minor blemishes.

Together with a transport, PDM I III amounts to a £1800 plus CD player. It strikes me as the sort of unit any enthusiast who wants the best from CD at a reasonable price should consider. It is one of the most advanced convertors currently available.

**Test Results**

<table>
<thead>
<tr>
<th>Frequency response</th>
<th>Distortion</th>
</tr>
</thead>
<tbody>
<tr>
<td>4Hz-21kHz</td>
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</tr>
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<td>Noise with emphasis</td>
<td>-106dB</td>
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<tr>
<td>Dynamic range</td>
<td>109dB</td>
</tr>
<tr>
<td>Output</td>
<td>2.3V</td>
</tr>
</tbody>
</table>

**Measured Performance**

As always, Deltec roll down high frequency response to a degree that is unusual, as our response analysis shows, yet PDM I III sounds neither warm nor 'smoothed'. It is something of a conundrum to me. CD players with such a response, of which there are an increasing number, reflect this property in their sound quality, but not the Deltec convertor. I suspect it is due to the design of their output circuits and filters.

There was no measurable distortion, at normal music levels. The spectrum analysis shows only noise from the analyser. This puts distortion harmonics below the 0.005% - low enough to be insignificant. At low levels and with dither, the convertor continued to resolve signals extremely well and with little distortion. It was up with the best in this respect.

Channel separation was very high, being not less than 100dB right across the audio band. There were no unwanted outputs above 21kHz and little noise too. In all respects, Deltec's PDM I III measured extremely well, NK.

**Frequency Response**

- Treble roll off above 5kHz, typical of all Deltec convertors.
The entire Art Audio range represents outstanding value for money.

Hi-Fi World, Dec 1991

The Tempo amplifiers compare very favourably with any valve amplifier on the market, from home or abroad, regardless of price.

Hi-Fi World, Dec 1991

This is one of the finest pre-amplifiers I’ve ever heard.

Hi-Fi Choice on Concordant Excelsior

It creates one of the deepest and most solid sound stages of any pre-amplifier I have encountered, valve or solid state.

Hi-Fi World on Concordant Excelsior

The Art Audio Quintet was the surprise of the group . . . sweet open and lucid.

Recommended Hi-Fi Choice, Nov 1991

The combination of Concordant Exultant and Art Audio Quintet is truly a marriage made in heaven.

Hi-Fi Choice, Nov 1991

A very high and wide stereo display with pinpoint accurate stereo images. What’s more, there is little sense of having three separate boxes; the sound is really very well integrated indeed.

CD Review On Pentachord Speakers, Nov 1991

The Pentacolumns are among the most revealing speakers I have heard.

Hi-Fi World, Dec 1991

I feel that the Art Audio Maestros are among the finest valve amplifiers I have ever heard. I can barely imagine anything more alluring.

Hi-Fi World June 1991

The big sound, all seeming to emanate from the miniatures, was quite astonishing.

Gramophone on Pentachord Speakers July 1991

We could not have said better ourselves . . .

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through Britain has a reputation for its hi-fi industry, formal education in the subject is uncommon. If you are interested in hi-fi, the nearest you can get is to study ‘audio electronics’ and find out about the complications and embellishments real hi-fi introduces from the hi-fi magazines, a few books (very few unfortunately) and, for the brave, from the Journal of the Audio Engineering Society, which is heavily research orientated.

Some of our Universities, notably Essex and Southampton, have serious audio research facilities and the North London Polytechnic has a City and Guilds Studio Recording Course as well as Degree courses in Electronics and Communications, which include an advanced audio (hi-fi) option.

Close to the magazine’s offices, we were surprised to find that the City of Westminster College (formerly Paddington College) offers audio related courses too. It seems appropriate, because literally around the corner from them lie the hi-fi shops of the Edgware Road, or what’s left of them nowadays. “Our students used to work in local hi-fi shops in Tottenham Court Road or Edgware Road, because they were conversant with the specifications of the equipment and the electronics,” said John Mizzi, the Senior Course Organiser.

Celebrating ten years of running Sound Engineering Courses, the City of Westminster College recently opened a new Music Technology and Audio Visual Suite. It is an extension of their facilities for the Sound Engineer’s Course which provides a City and Guilds qualification. Whilst this isn’t hi-fi specific it does give a good practical and theoretical grounding in audio electronics, from which further interests can be developed. “Much in our sound engineering course relates to hi-fi and audio, since we teach basic engineering,” said John Mizzi. “We have a lot of electronics labs in this college, including computers. We use Ferrograph test sets for more specialised audio testing. These back up necessary basic service equipment, like meters and oscilloscopes.”

Since the course has been developed with the assistance of the Association of British Theatre Technicians (ABTT) it is primarily aimed at those interested in theatre sound, concert PA sound, recording studios and such like. But with subjects like acoustics, audio electronics, computers and music as part of the syllabus, it also suits audio in the form of hi-fi quite well too. David Mellor, a course lecturer, put an emphasis on the practical. “We want do-ers - people who want to get their hands dirty, learning soldering, pulling things down and putting them back up. They must be practical. People who are equipment motivated are better than people who are music motivated, because the latter often don’t like to record speech. We need to cover everything on this course, including the recording and editing of speech.”

Although when we visited the college had broken up for Christmas and was quiet, its size was pretty impressive and I guessed it must normally be hectic during term. And we saw only the main building - there are another seven buildings in the locale. Thinking back to my school days and how I longed to get into a training establishment to learn electronics (London would have done fine!) the question of accommodation was raised. “We don’t have our own hostels, but we can help because there are the old ILEA hostels and we have a list of addresses offering student accommodation,” explained John Mizzi. “People come from all over the world to get on this course. This year we have one gentleman from Belgium, last year students from Switzerland, Peru and Sweden and the year before a student from Japan.”

“We can help people with jobs too, because there are so many aspects to sound: PA, recording, broadcast sound and theatre. Young people tend to look at the recording studio side but that’s only ten percent of it; there are plenty of other places to find jobs.” It helps that London houses a music business and the studios that service it, then there are the theatres, music venues, clubs and even a few hi-fi manufacturers. Students studying full time spend one day a week getting work experience and this can lead on to full employment.

Getting onto a course, full time or part time, is not too difficult. I was surprised to learn from John Mizzi that “The main entry qualification is the interview, although we do hope they have GCSE in mathematics or physics, but sometimes we waive this requirement. We like dedicated people who are very keen and we are prepared to give such people extra entry tests to assess them. We are the only college running this course in the UK, subject to inspection by Government inspectors; there may be some private colleges.”

This is a vocational course I was told; leisure students and hobbyists are not the intended audience. I asked whether many applicants came with an interest in learning about hi-fi. “Recent interviewees have not had an interest in hi-fi, but a few years ago many did have,” David Mellor told me. “We noticed a move away from objectivity (i.e. measurements) in the hi-fi magazines some years ago and have tended to relate this to the change of apparent attitudes.” They even have a part time electronics course they can dust off that has a specific hi-fi content; just ten applicants are needed. Let’s hope the City of Westminster College gets even more people wanting to study audio, electronics and hi-fi in the future.

The City of Westminster College in London runs courses in audio.

Noel Keywood checks their prospectus.

For details about the Sound Engineers Course (City & Guilds 182, 1 year full time or 3 years part time), or the electronics course, contact:

John Mizzi, David Mellor or Bill Philip, College. London W2 1NB.
Tel: 071-723-8826
Fax: 071-724-4827

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Above: Revox analogue recorders flank the mixing desk in the Music Technology and Audio Visual Suite at the City of Westminster College.

Left: John Mizzi, Senior Course Organiser (L) and Lecturer David Mellor.

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10 MIN FROM HEATHROW
Heybrook's launch of the new £110 Prima loudspeaker, their cheapest yet, shows they haven't forgotten their roots in the budget end of the market. Their last new product was at the higher end of the spectrum, the superb Sextet reviewed by Noel recently.

The Prima is a true bookshelf design. Small and well-built, the reflex loudspeaker is only 290mm high by 195mm wide and 180mm deep and weighs a mere three kilograms. With such small dimensions many will end up on bookshelves, where they will work well, but they benefit greatly from the use of good stands.

Although small and inexpensive, the Prima loudspeakers are well put together, looking solid and robust for the money in their black ash vinyl finish. The front grille is quite thick, but is easy to remove, showing the drivers held beneath. These are a 14mm hard domed treble unit and a fully screened 13cm bass unit.

The screening means that the Prima can be used up against a television without any colour fringeing - where the magnet of the driver affects the screen of the television. These are among the few hi-fi loudspeakers that are purpose built for Audio-Visual or NICAM installations, as alternatives to those within the television. The sensitivity of the loudspeaker, however, is not affected; it is a healthy 87dB sound pressure level with 1 watt input. These figures make the Prima a prime match for a budget system with an amplifier up to sixty watts.

Even though the Prima is a budget product, it is internally wired with solid core Heywire and uses audiophile grade resistors and polyester capacitors in the crossover. Half the manual, the same supplied with other speakers in the range, is redundant as these speakers are not bi-wirable, but the other half is clear and concise, offering good information for setting up the loudspeakers.

Heybrook's new baby has to face some stiff competition from companies including JPW, Mission, Royd, Wharfedale, Celestion - and Goodmans with their soon to be released Maxim 3 model. I compared the Prima against one of the leaders in this fiercely competitive field, the Wharfedale Diamond IV, both matched with budget equipment.

Though imagery is a failing of a boundary design. The Primas have surprisingly palpable imaging qualities when compared to other loudspeakers at the price. It is also staggering how much bass can be produced from such a small enclosure. Even with an amplifier like a thirty watt NAD, the Heybrook Primas filled the room with a distinctly impressive warm, bassy sound. After a while, one begins to notice a tubbiness which smears the deepest bass notes together into an indistinct low end sound, even on stands away from a wall. This is aggravated by the treble, which seems to lack force at the extreme top.

The Primas' level of detail was not too great, but at the budget end of the market, where they are most likely to be partnered with relatively screechy Compact Disc players, this may well be a good thing. They never once sounded offensive or brash, instead sounding refined and even polite. They have a Heybrook family sound: drama, life and plenty of bass, but never raucous or nasty.

These budget boxes were good at making sense of the vocals in difficult recordings and there was a good sense of coherence, the drive units working together well, making performances seem natural. From a rhythmic point of view they are quite lively and bouncy. I think that they will find favour with those who find their drive and verve enticing.

In comparison with the next price range up - £150, which includes Heybrook's own Solo - the Prima's sound muddled and hazy. The extra £40 lifts a good deal of fog. However, comparing the Primas to a pair of similarly priced Wharfedale Diamonds is a different matter entirely. The Wharfedale sounds ragged, uneven and harsh against the smoothness of the Heybrook loudspeaker. The Diamond appears at first to have a better treble performance - and sounds more "Hi-Fi" - but the Primas give greater priority to the music.

For those on a strict low-expenditure diet where an extra few pounds is impossible to find, I heartily recommend Heybrook's Primas. They have some of the attributes that make the budget Mission and the now-revamped Goodmans designs so popular. They do not disgrace themselves.

Alan Sircom is pleased to announce the birth of Heybrook's new baby loudspeaker, the Prima.
Pitching into a newly discovered slot for cassette decks come Marantz with their new SD-62, priced at £249.90. The slot I am thinking of is an interesting one that should have broad appeal, for it aims to squeeze high-ish standards of reproduction from recorders at medium cost. The formula calls for a single capstan transport of good quality, three heads, variable bias and - now - a high median bias level capable of exploiting premium grade tapes. The outcome, when thoughtfully engineered and well executed in the factory, is a cassette deck capable of fine results, well above those of budget machines. The SD-62 however is up against some very effective cheaper rivals, like Technics' RS-BX606.

Following the formula closely, the '62 has all the features mentioned above. A single capstan transport with DC servo motor is intended to provide good speed stability, which keeps music sounding clean, clear and stable. A single capstan transport is far simpler than a dual capstan type, but also cheaper and, in some cases, as good. There's a lot of variation here though. Unfortunately, I found the transport on our sample to be pretty poor. It ran too fast, which raised the pitch of prerecorded tapes a little. It also suffered from flutter, a form of high rate speed instability that adds the peculiar 'papery' colouration and coarseness characteristic of cassette. I was disappointed by the SD-62 in this area; it performs below the league at which it is aimed.

The three-head arrangement of the SD-62 consists of the usual collection of an erase head and independent record and replay heads, the latter being siamesed together in a single assembly. Such heads are more complex and expensive than the more common alternative of a single head that does both jobs (i.e records onto tape and replay off it), but they offer higher performance, which is crucial when trying to exploit modern premium grade tapes.

There are other benefits that make the recorder easier to use and exploit: the quality of a recording can be checked whilst it is being made. As the music is being laid down onto tape by the record head, it is being read by the replay head next to it. Switching to this, using the Monitor button that is a feature of all three-head decks, allows sound quality to be checked. It's the most effective way of assessing recording level and getting it right: too high and distortion will roughen and muddle the sound; too low and hiss will become more noticeable.

The SD-62 heads have a reasonably high performance I found from tests, but they were hampered by external factors, such as poorly contined record equalisation that resulted in an undulating frequency response curve. The Monitor switching from off-tape to input signal (Direct) is automatic, with manual override. Without this aid, three-head decks can go bewilderingly silent if the Monitor switch is set to the wrong position.

Traditional

Whist many of their rivals are using powered cassette drawers, Marantz stay with the traditional manual arrangement. Pressing the 'open/insert' button at top left causes the door to open swiftly. Pop a tape in and automatic type sensing, a now-common feature, senses whether it's metal, chrome or ferric and sets internal conditions accordingly. A small legend on the vivid blue display panel confirms the setting. User adjustable bias is provided so owners can fine tune the deck to match a wide variety of differing tapes. The SD-62 bias system works only with ferric and chrome tapes, though, limiting choice of metals to those that are compatible with it. Tests showed that compatibility was poor. Even normal metals produced too much treble and a bright sound; the problem became worse with premium grades like TDK MA-X.

That's MR-X PRO and TDK MA-X. The deck matched TDK AD ferric tape very well, but not TDK SA chrome. Matching needs some experiment.

Marantz fit awkwardly small operating buttons on a fascia that has ample room for larger ones. Similarly, the record level display was small and difficult to read, as were the legends. In contrast, the tape counter and a digital peak level display had large numerals and were both clearly visible. The tape compartment is unlit and the window so small that the tape inside is all but invisible, making visual assessment of remaining playing time impossible. The ergonomics of this deck are a victim to styling unfortunately. I found the SD-62 difficult to use.

A range of minor facilities, like music search, zero stop, music preview (10 secs of each track) are fitted, plus a headphone output with volume control. Build quality and finish were reasonable enough. I fancy the deck clanked less than earlier Marantz: muffled clicks and thuds were the response to control operation. Fast reeling was lackadasical though and the some of the push buttons felt none too solid.

In terms of the sound quality provided, this machine was a bit of a curate's egg. At times it was awful, and at other times it was quite surprisingly good. Prerecorded tapes sounded a bit vigorous, because they ran a trifle fast, but there was little to criticise in basic tonal balance. Here, the SD-62 displayed no sign of dullness and quite good apparent insight. I reeled through a variety of Rock tapes and encountered no trouble until Boston's 'Hitch a Ride', which started wowing really badly. The reason the deck refused to cope with this tape, where my Sony DD Quartz Walkman did, remained a mystery, but it strengthened my suspicions about the transport.

Surprised

I was surprised that Ashkenazy playing Chopin Nocturnes sounded basically speed stable, in that notes held their pitch. However, they were coloured by what can only be described as 'impurity', probably caused by high rate wow and flutter; making the piano sound rather coarse and jittery. With this tape the hum problem started to become irksome too.

Recording up to the indicated level of +10 on the display for metal tape,
XG was giving +8dB record level in the expected was the very high bias used; MA-XG weren't as bad as expected. That's MR-X PRO, although TDK MA-XG were engineered - ecord equalisation. 

Sounding due to overload and self erasure. Even with Dolby HX PRO fitted, treble overload occurs early and at a low level (10dB) with normal tapes, giving a dull sound due to overload and self erasure. Premium grades must be used. TDK AD for example giving a flat frequency response with standard metal tapes like TDK MA displayed rising treble, even though bias was set very high. The response peaked at +3dB at 16kHz, as shown in the analysis, an amount that can clearly be heard to add brightness to the sound (at least). This was down to poorly engineered record equalisation.

There was even more treble lift with That's MR-X PRO, although TDK MA-XG didn't have as bad as expected. The reason for smaller differences than expected was the very high bias used; MA-XG was giving +8dB record level in the mid-band, a very high figure. However, treble reached only -1dB, the 9dB difference in overload levels (overdrop) being inappropriate for Rock music, if perhaps more suitable for many Classical works. I feel that Marantz have settled on 9dB, which I feel is excessive. Bias has been set very high with ferrics and chromes as well, which dramatically alters the usual patterns of compatibility. Even with Dolby HX PRO fitted, treble overload occurs early and at a low level (10dB) with normal tapes, giving a dull sound due to overload and self erasure. Premium grades must be used. TDK AD for example giving a flat frequency response and good overload figures of +4.5dB in the mid-band (i.e. MOL315) and -6dB in the treble (SAT10 kHz). High chrome bias overwhelmed TDK SA, which managed only +3dB MOL and -9dB SAT10kHz. TDK SA-

X was a better choice. Summarising all this, the SD-62 has rising treble and an over bright sound with metal tapes. Nothing can be done to alleviate the problem, since bias is not variable with metals. Only high performance ferrics and chromes match the deck and they can give very good results when tuned in. Record gain (aka sensitivity) was set fairly well, allowing the Dolby system to work properly. Dolby gave the proper amounts of hiss reduction, but some hum was measured.

The transport on a deck like this has to perform well, but our sample failed to do. With flutter and significant amounts of random wow and drift, seen in the analysis, it didn't offer the sort of speed stability that is expected. The total wow and flutter figure of 0.12% is a measure of this; 0.08% or less is required and now common. In many areas, the SD-62 displayed weaknesses. Bias is too high, it is not adjustable with metal tape, metal tape compatibility is poor, there is some hum and the transport runs fast and displays poor speed stability. This isn't an impressive catalogue of strengths.

Test Results
REPLAY (prerecorded tapes)
Frequency response (-2dB)
30Hz-20kHz
Speed accuracy
+1.6%
Hiss (70uS, Dolby out)
-61dB
RECORDING (blank tapes)
Frequency response (IEC Primary Refs.)
ferric (IECIII) 11Hz-11kHz
IECII (chrome) 11Hz-20kHz
metal (IECV) 11Hz-11kHz
Separation (1kHz)
-68dB
Distortion (315Hz)
0.25%
Hiss (70uS, Dolby out)
-56dB
Speed variations (DIN total)
0.12%
Flutter energy (3.3-13.1kHz)
-23dB
MOL/SAT (IEC Refs) 315/10kHz
IEC I (ferric) +3dB/-10dB
IECII (chrome) +3dB/-10dB
IECV (metal) +5dB/-3dB

Speed Stability
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BECAUSE PEOPLE LIKE MUSIC

FRANK HARVEY

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Continued from page 11

I suppose most users will not want to have their amplifiers on all the time, but in the case of the MF AI it seems necessary for it to perform properly.

To be practical I favour Class AB instead of Class A, or near-class A type of amplification. I am now quite happy with the Creek driving a pair of Monitor Audio Monitor 7s, fed from a Revolver and an old-ish Philips CD player.

One little suggestion for your review pages on the CD provided: it would be rather more convenient if the pages can be arranged in such a way that when cut along the dotted lines, folded right down the middle, and stapled at places indicated, forms a little booklet which goes when cut along the dotted lines, provided: it would be rather more convenient if the pages can be arranged in such a way that when cut along the dotted lines, folded right down the middle, and stapled at places indicated, forms a little booklet which goes into the lid of a standard CD box?

Heard of a record label called 'Hugo'? It is one of those audiophile labels used by many in Hong Kong (where I worked for a while after leaving Britain). I think it is still a one-man-band, ran by a recording engineer who used to be a musician (sounds somewhat like Chesky). I listened to a track during the recording of which a string snapped: scared the life out of me, and I still haven't got the guts to play it again.

Well, must dash. My very best regards and wishing you and Hi-Fi World a very successful New Year.

Samuel Tang
East Roseville, NSW, Australia

Most hi-fi components benefit from a good warm-up before listening properly. Try leaving your CD player on constantly, to see what we mean. They don't all have quite the personality change you suggest exists with the AI, however, but this amplifier is uniquely characterful we have found.

The CD sized insert is a good idea and we have been considering this for some time.

I have never heard of the 'Hugo' label, but I once had a cat named 'Nibby' if that's any use. Most of the audiophile recordings that I have heard, stem from Europe and the US.

Hopefully, one of our far-flung hi-fi hounds will be able to tell us about Hugo and his problem with strings. AS

GOING INTO REVERSE

I was very interested in Noel Keywood's article in the December issue, and in particular his description of the Dual Capstan mechanism, but I would welcome additional information as to how capstans operate with auto-reverse decks in view of their slightly different speeds. I am especially interested in JVC's new model the TD-W805 which additionally uses quick-reverse mechanisms in both decks.

B. L. Norval
Hove, Sussex

Auto-reverse decks have two capstans, as you've probably already noticed, but they are not dual capstan decks. The difference is that only one capstan is engaged at a time. The pinch wheel sandwiches tape against the right hand one (looking from the front) when going forward. It disengages and the left one engages when going into reverse, the left capstan turning in the opposite direction. Whilst this is happening the heads, which sit on a rotating platform, whip around, so they read different tracks and the erase head is placed 'ahead' of the record head. It's all very complex mechanically and something the Japanese excel at as a result.

A dual capstan deck runs in one direction only (although Akai have made a dual capstan, auto reverse) and both capstans are engaged simultaneously. They also rotate in the same direction, but the back-tension capstan rotates a little more slowly.

We haven't tested the JVC deck you talk about I'm afraid to say, so we cannot comment upon its performance. NK.

PLUMBERS MATE

I read with interest your articles on both open-backed speakers and 3 way speakers. I have built my own speakers using those principles and many other tweaks. You may be interested in looking at it for one of your articles on Readers' systems. The speakers started life as a Technics SB 6000, a large box 700mm x 450mm x 35mm with 12" woofer and a linear-phase, dome tweeter mounted separately on top. The tweeter on top has been replaced by a unit similar to the top of a Meridian 6000. This is in 25mm chipboard with the best SEAS tweeter and midrange I could buy. This is open backed with a felt backing. It is damped with a combination of lead and my own personal tweak (as opposed to borrowed or stolen): masses of 'Plumbers Mate' which is a non setting putty at £5 for 3 kilos. About 2 kilos are used in each top unit, as well as lead.

The speaker chasses are also damped with 'plumbers mate'.

This unit sits on two sheets of glass, damped and joined together with large quantities of 'plumbers mate' and then on cones on the top of the bass unit. The large reflex woofer box has been given large quantities of Butymastic damping and lots of extra bracing and the drive unit is the original Technics 12" woofer.

The top unit has rounded edges and is completely covered in felt (except the drive units of course) and the front face of the woofer under the grille is covered with felt.

I had problems spiking them to the floor despite screwing many screws into joists etc. I then built stands of 2 paving slabs covered in black carpet. (Very heavy! Very cheap!) On top of this are cones supporting sheets of glass dampened with 'plumbers mate' and the speakers sit on this. I recently built up bricks from the foundations to give 4 support areas for cones on which the stands sit. The crossover I built myself with mostly polypropylene capacitors and air-cored inductors which I wound myself, as I couldn't buy any of the right size. This is hand wired throughout and to the three speaker cables per side back to Hi-Fi World banana plugs and a Musical Fidelity A100.

The front-end is Thorens TD160 and Marantz CD655SE. I did some extremely successful mods to the CD player: I read Paul Messenger's article in Hi-Fi Choice about a bread-boarded CD player whose transport had been mass-loaded with Blu-Tack and which apparently inspired Naim's CD player. I mass loaded the transport with 'plumbers mate', put sorbathene on all microchips and perhaps most effective of all wrapped sorbathene around the drive motor. I also added extra sorbathene 'spring's to the subchassis of the transport mechanism. These modifications noticeably increased recorded ambience, made silences "blacker" and got rid of some "hash and grain". Oh, I also glued two sheets of lead to the CD player base and this rests on a sandwich of two sheets of glass with 'plumbers mate' in between on cones and then on a sheet of marble with spikes embedded in it. I like the sound of the system very much. As you might imagine, imaging and sound staging are very good and so does its dynamics. It probably helps that the speakers are very sensitive - 10 o'clock on the amplifier is about as loud as I ever need. Bass goes down to 30Hz or so.

Terril Park,
London W3
Further to November's sceptical thoughts from Tony Taylor of Lasaway's 'green pen theory' (and many reviewers' apologies for it), could I draw attention to a certain Fred E. Davis of the USA?

As an electronics engineer, he decided to test this theory by increasing the amount of internal reflections in a playing disc. This should make the sound noticeably worse if, as claimed, reducing such reflections enhances sound quality. Mr. Davis made measurements of jitter, etc. while injecting light from two different lasers into a CD from numerous locations and angles.

The results showed 'no change in error rate ... eye pattern, no mistracking of the servos and ... no change in the digital data read from the CD.' (See 'The Skeptical Inquirer', vol. 16, p.91.) Furthermore, there was no apparent deterioration in sound quality.

Noel Keywood's assertions that, for example, green ink 'increases light intensity as it reaches the laser' and that 'benefits may come in reduced jitter' mean little in the absence of proper scientific data and analysis. Many such assertions are directly contradicted by the above experiment. Mr. Keywood's mention of 'complex' translation processes and his conclusion of 'Who knows what all those electrons are up to?' only causes unnecessary obfuscation in the light of Mr. Davis' straightforward demonstration.

Of course, Mr. Davis' test and results are not definitive, nor does he claim them to be. Such results however, should be publicised for the benefit of potential green pen buyers. Also perhaps reviewers and advertisers would oblige us all with hard data and not the dubious theorising and hyperbole one all too often reads about such 'tweaks'.

Richard P. Ward
London SE13

On page 10 of the November issue you state "It has been proven that the Green Pen increases light intensity reading..."
the laser." Leaving aside the fact that the light is emitted from the laser and received by a photo-sensor, what proof exists that the Green Pen has any effect whatsoever?

Ross Walker, Quad

We suggested Jimmy Hughes...

Jimmy Hughes is living proof that "there's nowt so strange as folk."

Nevertheless I do not think that you can write that proof exists when in fact none does. That's how so many of the myths which plague our industry arise. As far as the green pen is concerned, it can be shown that it has absolutely no effect whatever upon the performance of any player. Proof that most of our reviewers have over fertile imaginations.

Ross Walker, Quad

Since we had rather taken his name in vain, we asked Jimmy Hughes if he'd like to put in his ha'porth. Here it is, backed up by Thomas Huxley.

I do not pretend to know exactly why it is that treating the edge of a Compact Disc with a green felt-tip pen should alter its perceived sound. But my ears tell me it does, and many thousands of sceptical but open-minded hi-fi enthusiasts worldwide have tried it and found likewise. Hard scientific proof may yet be missing, but that is no reason to just dismiss the whole thing out of hand. After all, isn't it often the case with science that observ- able, repeatable phenomena are witnessed long before a convincing explanation de- mystifies things?

For what it's worth my own personal belief is that the current explanation - to do with the control of random scattered light within a CD is not correct, or at best only a partial answer. For one thing, many Polygram CDs have an opaque aluminised edge that is presumably light-proof, yet the pen works as well on these discs as those with a clear edge. And how to explain the fact that the green pen works very effectively on vinyl LP records? No scattered light there!

Experiment further and it's hard not to conclude that all objects (not just CDs and LPs) can be beneficially manipulated by means of a suitable colour and shape. For example, green is not the only colour that works on Compact Discs. That tireless experimenter into all things strange and wonderful Peter Belt advocates a lcm line of violet ink from a Staedtler Lumocolor pen. This, I think you'll find, is even more effective that an all-round coating of green. But how can a lcm line of ink make any difference at all - especially if we stick to the scattered light theory?

For real enthusiasts Peter came up with a five colour treatment pattern which worked even more effectively, though it took a while to apply! The implications behind all this are pretty staggering, and anyone with even a little sense of wonder can see that an enormous number of new possibilities are opened up.

Finally a brief quote from Thomas Huxley who, in a few short words, expressed the ideal scientific attitude to new Phenomena when he wrote "Sit down before a fact like a little child, be prepared to give up every preconceived notion, follow humbly to wherever and to whatever abysses nature leads, or you shall learn nothing."

Jimmy Hughes

I always like reading readers' experiences on hi-fi and plugs. So I'll tell you mine. I read in an Audiophile (no, in two) that connecting the Compact Disc into the tuner input of the amplifier gave a better sound. So I tried. Wow, it really was better. Then I woke up one morning (after a prophetic dream) with the great idea of painting the plugs in green - of course! - and the sound, at that stage, was Wow Wow Wow! So I decided to paint the CD in green and Wow Wow Wow Wow! By that time I had gone bananas so I painted the whole room, then the whole house, then the outside in green, green, green.

Now my Philips 620 CD player sounds like a Mi- cromega Trio, and I'm going to paint the whole city green. And I'll sing the Supertramp song 'Don't Arrange To Have Me Sent To No Asylum'. Of course, I am a great supporter of Greenpeace . . .

I propose you give a one year subscription as a Letter of the Month Award - the first, will of course, be for me.

Moshe Benarroch, Jerusalem, Israel.

Experiments with green by Hi-Fi World editorial staff continue. Our farther-flung personnel report marked improvements in commuting pleasure through abandoning all Tube lines except the District (coloured green on the London Underground map), their cars and feet and taking to the Green Line buses. Noel is considering having the editorial Range Rover resprayed British Racing Green, and we have been thinking of taking up London dealers Kamla's offer to respray our equipment a tasteful shade of lime.

Readers may have observed an increasing amount of green background to our photographs, and we have attempted listening sessions on the lawn outside the office. . .We're not so sure about a prize of one year's subscription, though. It might encourage all sorts of loony - ahem! - closely argued and rational letters, mightn't it?

Serious, however, a research report by Dr Peter R. Smith of Loughborough University of Technology comes to rather different conclusions to those of Fred E. Davis. A light emitting diode with a peak output at a wavelength of 850nm and a bandwidth of the order of 80nm was delivered to the surface of a Compact Disc at an angle of 45 degrees. Reflections were captured by a receiving fibre positioned in the specular direction in a light-proof container. The receiving fibre was connected to an optical power meter capable of making relative power measurements in the range +3dBm to -40dBm. Since there would be an inevitable variation in the thickness of the application, average values were obtained over a series of experiments. The results with a variety of pens, including red and blue ones readily obtainable from stationers, were interesting, showing between a 60% and 90% absorption of red and infra-red light illuminating the surface of a Compact Disc. A blue pen, intriguingly, proved to have a rate of absorption very near (two per cent) to a "CD Green Pen" on the market, while a readily available red pen demonstrated less absorption, but to a similar degree to another brand of green pen sold for use on CDs. One of the popular green pens absorbed some 80% of the reflected light, another 90%. Readers may choose for themselves whether to argue from Mr Davis' findings, or Dr Smith's.

Experiment is one thing, interpretation is quite another. It might be worth bearing in mind that philoso- phers once earnestly discussed the number of angels which could sit on the head of a pin with a fervour of debate equalled more recently by physicists hunting Quarks and even more elusive particles. It is all down to the individual's weighing of the evidence in the end. If all science was an exact pursuit, there would not be the often acrimonious debate there frequently is in the journals.

Sceptics should bear in mind that if effects are purely psychological, they are not being imposed on anyone. If I go to a concert and enjoy the performance more having removed my glasses, no amount of acoustic measure- ment will show any difference in the sound reaching my ears, but I will come out happier nonetheless.

If a green pen, green ring, whatever, fertilises some listeners' imaginations, so be it. Listening to music, as well as making it, is a creative business. EB
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<th>Total Kit</th>
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I have treated “tweaks” with some amount of derision in the past, having tried a few via the “Belt phenomenon” and others.

I applied Laserguide, as per your instructions, to my Chris Rea “On the Beach” Compact Disc, as some of the tracks on this particular CD tend to sound a bit ragged to my ears. I have also found this to be the case on the LP version.

On using the Laserguide I found the sound to be “smoothed out” and more mellow; it made the CD more listenable with Chris Rea’s voice appearing to lose some of the gravelly tone. Yes, I liked it. Some may say that it gives a false impression of the sound, as a friend of mine did, but on my old steam-driven Philips 471 it has certainly tidied things up. So much so that I’m going to buy a bottle, which will help matters along until I can afford a player such as the Rotel bitstream model. Thanks Hi-Fi World.

Mike Wray,
Waterlooville, Hampshire

What prompted me to write is the small sachet stuck on your December issue. What’s that, I thought? Having in mind the debate on Armor-All, I was rather suspicious - I myself damaged a couple of CDs. I won’t describe my system since it is composed of - more or less - home-made stuff. The front-end is an early sixteen-bit Micromega CD player and I use valve amplification.

Although I thought I was taking a risk, I treated three of my favourite discs. As Eric said, “my eyebrows lifted.” What a difference, what an improvement! The discs, which are highly complex organ and orchestral all-digital recordings suddenly became clearer, less aggressive and the soundstage was significantly better too. But I’m still perplexed. You see (I have experienced this before) when you expect some improvement, no matter how effective the product is, it always seems magnificent in the enthusiasm of the moment. As I feel I can’t deny laserguide has an effect, I’ll try to get a bottle, if it’s available here. Now I’m having to try it on my other CDs. Anyway, thanks for the very best magazine available in Europe - less than a full blown promotion of a product that companies and individuals with vested interests will try to sell, whether it works or not. Given the choice, I’d rather spend £14.95 on another CD than a bottle of LaserGuide. I think even Kylie Minogue would be better value.

Richard Ward
London
P.S. One of the LaserGuide-coated discs used in our test had also been given the ‘green pen’ treatment, but somehow none of the listeners noticed.

Glad to hear it, Messrs Frantz and Wray. After hiding under my chair from a sudden hail of green pen letters I had laid in a stock of tins to survive a siege of “What a load of (insert favoured expletive)” missives on Laserguide. Well, one arrived and now I have to take issue with Mr Ward.

I mean it! I discovered your magazine last summer trying to get a tan on a North Sea beach . . .

J. Frantz, Lyon, France

Thank you for the sample of LaserGuide with December’s issue. I listened to its effects in a test I conducted with two friends.

The test was in two parts. We used eight compact discs (four CDs duplicated), one of each pair was coated with LaserGuide. First, we listened to selected tracks from the untreated CDs. Then the LaserGuide-coated discs were played for comparison. We all noted the sound of both discs. In the second part, the CDs were mixed up so that no one would know if any playing disc was treated or not, except by listening.

The results from both parts of the test were unanimous. No one noticed any difference between the discs of each pairing, nor could any of us identify any of the LaserGuide-coated discs in the second part. The conclusion was, inevitably, that if LaserGuide works, it’s too subtle to be of any audible benefit whatsoever.

After reading your magazine and doing this test, several things occur to me. Blind testing, for example, should form part of any testing of tweak products. If we had heard any differences in the first stage of our test, the reliability of these first impressions would have been properly shown in our blind trial. Eric Braithwaite, on page 49, mentioned the very real effects of suggestion, which can predispose listeners to hear imaginary changes. Noel Keywood, however, failed to mention this in his advice to readers wishing to test LaserGuide.

The explanation of how LaserGuide allegedly works is very dubious; it reads like many other vague, pseudo-scientific bits of blurb that accompany other tweak products. We were also treated in the same issue to a ‘Sceptics’ Quest’ which, for all Eric Braithwaite’s peculiar form of scepticism, just happened to give the impression that LaserGuide is wonderfully effective.

What I read was nothing but the review came about because I had expressed my own scepticism to Bill Low himself, on the lines of Mr Ward’s doubts, in fact, at the Penta Show. Far from being subject to suggestion, I listened in a far from accepting frame of mind. Should I find a product which is unsatisfactory, given the normal legal constraints I am not afraid to say so, and I would hope that most readers would accept my integrity. It is possible, of course, that a scepticism about tweaks generally can communicate to others as effectively as enthusiasm.

Our cover sample was free - so people could make up their own minds and be able to spend the money on a Kylie Minogue CD instead if they so wished. EB

We offered a free sample of AudioQuest’s Laserguide Compact Disc treatment with our December issue and asked readers to send us their responses. Here is a representative selection.

Laser Lore
queries

Since Hi-Fi World has such an interest in valve equipment, I wonder if you could help me with a problem I am experiencing with an Audio Innovations Series 800 pre-amp and Eden 12 power amp. The Eden has a very high input sensitivity of 250mV, much too high for the 800, resulting in very restricted volume control resolution and perhaps other nasties like excessive distortion or noise. It has been suggested that the amp could be de-sensitized by increasing the level of negative feedback, reducing the value of the resistor. Is there any other solution, apart from changing one or other of the amplifiers? I noted with interest the article on the Leak TL25 valve power amplifier, in particular the change of mode of the input valve. Perhaps I could do the same with the Eden 12?

Rod Theobald, Rochdale, Lancashire.

We spoke to Definitive Audio of Brighton, who suggested this solution:

Following the feed back loop from the red speaker terminal, you will come to a 4.7k resistor shunted by a 220pF capacitor, then another 4.7k resistor. By-pass, or replace, the second 4.7k resistor with a lower value. This will reduce the sensitivity by increasing the feedback. EB

My system consists of Quad 405-2, 34 and FM4 linked to Spendor SA1’s by QED 79 cable. Ancillary equipment is Marantz SE60 CD player and Aiwa 770 cassette deck.

Although pleased with the sound, the combination of Quad and Spendor being pleasantly neutral and articulate, the bass is somewhat of a problem. Reasons of space compel me to place them on shelves, fairly close to the wall, and older Spendors were not noted for good bass anyway. Is there any other solution, apart from changing one or other of the amplifiers? I noted with interest the article on the Leak TL25 valve power amplifier, in particular the change of mode of the input valve. Perhaps I could do the same with the Eden 12?

Cris McLean, Boness, Lothian, Scotland.

Assuming you can get a hold of the Rock Reference, I have heard the Rock Reference/Excalibur together with the larger Townsend and yes, they do produce a soundstage that you can walk into, shake the hand of the trumpet player and so on. They do not need an exorbitant amount of power, either. I’m not as conversant with the big Missions, but I am reliably informed that they work well, performing best with a brace of Cyrus 2s and PSX power supplies.

First, the cartridge. I think a Decca would be a good bet in an arm like the Escalibur. Before you settle for a Decca, however, try a cartridge like a Audio Technica AT-0C9 (or its successor) or a Dynavector.

Finally, would you comment on interconnect and speaker cables, bearing in mind I shall retain, or stick with, Quad. My musical tastes are mainly classical, opera and middle of the road pop.

Tony Fordy, Exmouth, Devon

In order, there really is no substitute for taking the Sendors away from the walls. A friend of mine, with similar tastes and similar equipment discovered the Rogers LS2s, which might well suit, and can be put with their backs to the wall. These would have been picked up second-hand, as they have been superseded by the LS2a/2. Check these out with a Rogers dealer. However, the answer to the last question may also be an answer to the first. Aforementioned friend has achieved results similar to the ones you desire by using Kimber 4PR speaker cable. This may well be worth a try with the Sendors. Quad amplifiers generally speaking seem to be some of the least fussy about interconnect, but I have found Tony’s low capacitance, low-loss patch cord, sold in phono-phono pairs (and in colour) at around £8 per metre pair to be very effective and transparent. There may be a little nifty work involved here for the pre-power interconnect if your 405-2 has the four-pin DIN input, but it is well worth trying elsewhere throughout the system.

It is great to see the D.I.Y. aspect being revived, together with articles on older hi-fi equipment. Besides valve, I hope you will not ignore the better solid-state models such as the Sugden A48, Leak 30 Plus/70, Radford pre-power, etc. etc.

I look forward to seeing more reviews of do-it-yourself speakers. After your favourable review of the TDL1 I would recommend you try out some of the IFL Acoustics transmission designs using SEAS and Morel drivers. They are excellent, and with wood veneer they are arrived at a third of the price of the commercial models.

I was pleased with your review of the Ion SAM 40 system. I had auditioned it before your article against my then Exposure XV and found it a considerable improvement, so I am now the proud owner of the Ion system. When it was pointed out, I can build up to a full active system using my IFL transmission line speakers. But the main reason I am writing concerns the Leak Troughline tuner. After your article I managed to acquire a stereo version in perfect working order and virtually spotless for ten pounds. After a brief conversation with a gentleman from Electronics Colour Services I was advised that if everything was working well to leave it alone or perhaps renew some of the valves. Any comments?

In comparison with my Rotel R70 tuner, there were gains in imagery, more musical involvement and a more realistic sense of presence through the Rotel was not lacking in any department. There are some minus points. It is less sensitive than the Rotel; I can’t get maximum signal strength as I could with the later bigger aerial. It is also more prone to mains interference. But the biggest annoyance is its low output, which was not mentioned in your article. I have to turn the volume up to 2 o’clock plus for the same dBs I was getting from the Rotel at around 9 o’clock. Adding to the SAM and going active will give me more watts, but recording off-air I can only get to around -1 peak recording at maximum input, which is obviously insufficient for optimum dynamic range. I would appreciate it if you could offer me some advice on what could be done to alleviate the above problem.

What is the output of the Leak? I have heard mention of 25-50mV? Besides the old Stereo 70 are there other amps suitable for the above for a possible second system? Are there any line amps that can be used to boost the signal without destroying the sound quality?

Lastly I am seriously considering the Ion FMT1 to go with the amplifiers. It is highly recommended by the dealers I have spoken to. How does it compare to the Leak, and are there any others within a price range no higher than the Ion I should consider.

R.D.Lewis, Tenby, Dyfed Wales

Do not have your Troughline ‘restored’, unless the unit is not functioning at all. Unlike an amplifier, a tuner, particularly the Leak models, has components that live in a form of delicate balance. Change one component and the whole device can go out of kilter. It is immaterial to the Leak, realigned; however, this can act to improve the sensitivity and to ‘up’ the gain of a poorly aligned Troughline, without the need for a line amplifier.

As we are dealing with a product that was discontinued before the discovery of crushed velvet loon pants, any output figure can only be looked on as a rough guideline; the quality and amount of Tender Loving Care a Troughline has received throughout its life could affect its output performance. In Leak’s spec. sheet for the mono Troughline II (Jul. ’66), it suggests that the audio output is approximately one volt. If our Troughline III was anything to go by, this quoted figure was very approximate.

A correctly working Leak will give almost any current tuner a run for its money, regardless of cost. If you cannot live with its poor sensitivity and low gain (even after realignment), then go for the Ion. It’s well made, sounds good at the price and is a good match for the SAM 40. AS

At long last I’ve settled on the Rock Reference/Excalibur as my find-futurnicate, just as it looks like they’re going to stop making records! I’m going for the larger Townsend speakers (Sir Tristans, I believe they’re called) or possibly those big Mission 767s.

What I’d like is your advice on cartridge and amplifier choice: I thought maybe a Decca and a valve pre-power. My valve taste is wide and I have a very large and ‘bright’ room, and about £2500-£3000 to spend. I like a sound I can feel as well as hear - something which can walk the furniture around a bit. Oh, and I need six inputs. Any suggestions?

Cris McLean, Boness, Lothian, Scotland.
Write in with your problems to Hi-Fi
World, 64 Castellain Road, Maida Vale, London W9 1EX.
Our panel of experts will endeavour to solve them or at least offer some practical advice.

? My system consists of an LP12/Lingo sat on a stackable type Sound Organisation table. Amplification is a Naim 72 (upgraded from 32.5/250/\text{HICAP} and A4 cable with MkI Kans.

I am unhappy with the sound of the system. The cartridge seems to mistrack and cause a tizzy distortion in the mid treble. I have experienced this to varying degrees since I purchased the K18 and it is very dependent on particular recordings. Any LPs with a dynamic treble, especially piano and strong vocals, will set it off - my collection of Carol Kidd LPs for instance, especially the latest. After a few playings the LP itself seems to be damaged, as it generally gets worse.

Both my Linn dealers seem unable to help: they both see nothing wrong. I have tried a new table, new belts, a service and a new stylus, all to no avail. The dealers assure me an Ekos cartridge and a good passive gate cartridges like the Morch type Sound Organisation table.

Now, the amplifier. My feelings would be toward an Art Audio or Audio Innovations triode power amplifier, with a Michell Iso for the phono cartridge and a good passive pre-amplifier for the other sources. Passive devices here include the NVA and Audio Innovations' own. If you decide on the moving magnet Decca, however, you will need a different type of head amplifier to suit it. Here, I would suggest the NVA Phono2 or the budget Michell also for the phono.

Amplification is a Naim 72 (upgraded from 32.5/250/HICAP and A4 cable with MkI Kans. It is very dependent on the moving magnet Decca, and a new stylus, all to no avail.

The question is, therefore, can you suggest a cure, or, as I suspect it is the cartridge, a replacement or ones to try without getting into silly money? Incidentally, do you consider it worthwhile trading in my MkI Kans for the Mk2 version? Please can you suggest some kind of cure as I am considering selling the lot and getting a CD as a replacement.

F.A. Johnston-Banks, Chester

This sounds as though either the tracking force of the cartridge is wrong, the bias setting is wrong, or both. The setting-up must be checked against Linn's recommendations. A misaligned cartridge - check that it is also vertical in the headshell - will produce exactly this kind of distortion. If the K18 is correctly set, then the damage began with the cartridge it replaced, probably from a similar cause. Unfortunately, if that is the case, it's irremediable, and the only cure is to replace the records. Before you do that, take them round to a friend's to check.

EB

The Mk II Kans sound slightly more acceptable to people with CD players; the early Kans can sound a bit overbright with all bar the finest players. They also appear to have a deeper bass performance than the Mk Is, although this is not a major improvement. More important than the loudspeakers in many respects, are the Kan II stands. If your loudspeakers are on the early stands, made entirely from box-section frame and with no steel top plate, it is well worth getting the newer Kan II stands. This makes a huge difference.

Finally, please get a separate turntable support for your Linn; either a wall shelf or a table. Without this, it's akin to using a Ferrari with remould tyres. Auditech and, ideally, Mana Acoustics seem to work the best with the Linn, but failing that any of the reputable companies make good shelves and tables, and even the IKEA Lack coffee table must get a mention in dispatches. I would suggest that this would go a long way toward helping your mistracking problem.

? My five year old system, consisting of Linn Axis/K9, IncaTech Claymore and Epos ES14 speakers would be ripe for an upgrade to an LP12 by now. However, I can't afford to do this and wondered about alternatives.

Malcolm Steward has said more than once that the ES14 will only 'sing' with a first class front end. In view of this do you think selling them and buying the likes of Mission 780s, B&W DM600s or Tannoy E1 Is would be a good idea?

W. P. Kent, Warrington Cheshire

Why do you want to take a backward step with your system? I think that you would be far better off waiting another year or so and get the Linn, rather than make a retrograde step, back to a lesser pair of loudspeakers.

If you find it impossible to resist the temptation to change, certain improvements can be made. First, if your system is five years old, how old is the stylus? It may be in dire need of a change by now. Secondly, are the turntable and amplifier on good stands? If not, money would be better spent here, rather than on the loudspeakers.

Only then can you look at the loudspeakers. The Epos ES1 Is seem to be an obvious choice if you need to change the ES14s. They have many of the virtues of the larger ES4s, but are not as demanding to drive. Apart from these, both the B+W 610s and Mission 780s were well received by our reviewer in our September group test.AS
I read the review of the Excelsior pre-amp with great interest. This was the piece of equipment that turned me on to valves in a big way. My power amp is Audio Innovations First Series. I know you are familiar with this set-up and that is why I have written to you. Some time ago I made my own passive pre-amp with some success, using the expensive £90 Penny and Giles pot, but replacing the Penny and Giles with Russ Andrews’ at £18 was a revelation. Remembering this, and always being a meddler, I replaced the Alps pot in the Excelsor as well. In a blind test I think I might reach in my pocket for about £500 - I think it is that good.

I have been a professional singer for thirty years, and while not claiming the best ears in the world, I don’t think they are painted on! It would be nice to hear what you think.

John H. Parry, Royal Opera House, Covent Garden

Well, that is a surprise. What you pay for in the Penny and Giles pots is, of course, engineering - it might be over-engineering, even - and quality control, as far as I know. However, I have built my own passive pre-amp, the sonic improvements do not necessarily increase in proportion to expense as much as care with wiring and soldering. The snag with cheaper pots tends to be that they wear and become crackly - Deltec use Penny and Giles, and after a good deal of use they are still as smooth and silent in operation as they were at the beginning. At least £18 seems a price which allows experiment without the bankruptcy court coming in on the act if the results are unsatisfactory. Readers should be warned (again!) that replacing pots is liable to void the manufacturer’s guarantee and the process should be undertaken with care, not least in ensuring that the resistance, for example, matches the original specification. Otherwise distinct anomalies in the sound will result.

EB

I was particularly interested in your valve feature in November’s “Tweaky Corner”. I have an Audio Research D70 power amp. (three or four years old) and an Audio Research LS11 line-amp. I also have Quad ESL 63s, Meridian 670/606 and Quad FM tuner.

Would I benefit from your findings by replacing some of the existing valves by ones from Groove Tubes or Golden Dragoon? I am not an electrical expert by any means, but could I replace these myself if I do need an expert? Also, where do these companies hang out?

J. H. Evans, Newcastle, Staffordshire

I read “Tweaky Corner” on your valves with interest as I have substituted Golden Dragon EL34s for the standard valves and have noticed a definite improvement. However, I should like to try Groove Tube valves in the earlier stages. Could you print their address?

P. R. Davis, Doncaster

There is no reason why you cannot replace the valves on your Audio Research amp yourself. It might seem obvious, but don’t forget to switch the amplifier off before you do so. The valves’ bases are designed to fit only in one way, so replacement is easy. For the LS1, fit one 6DJ8 valve, while the D70 uses seven 6DJ8s, two 6P3560s, one 6530 and a 6L6. Either company should be able to supply these valves, or their equivalents.

Groove Tubes are located at 6 Ivy House Lane, Coseley, Bilston, W. Midlands. (0902) 885101. Golden Dragoon, or PM Components, are based at Springfield Enterprise Park, Springhead Road, Gravesend, Kent DA1 8HD, Tel (0474) 560521. AS

I currently own an LP12/ Lingo/Akito/K18 on a Mana Reference Table, a Pioneer A400 and Tannoy DC2000 speakers with Exposure cable and I need some advice on the best way to upgrade.

I mainly listen to Rock music. My thoughts are whether to purchase a new arm. Would an Ekos be worth the extra cost compared to an Ittok, or is the Naarm ARO suitable for heavy rock? Or should I be looking at a new amplifier, possibly the Naarm 72 pre-amp, and a power amplifier when funds permit?

Finally, is CD a viable alternative - perhaps a Meridian 200 with a Deltec converter - would this be able to compete on sound quality with the Linn, even with a better arm?

Nigel Wheeldon, Birmingham

Normally, I would suggest going for an Ittok. Ekos or an Aro as the next move in a system, but I feel that your system cries out for a different amplifier than the A-100. The Phenix stage on the Pioneer is O.K., but I would feel that a Naim 72/140, or similar, healthily blows it away, especially when it is used with a Linn front end. If you are happy with the pioneer, however, go for the Ekos or the Aro, if you can afford them.

Either arm is suitable for heavy rock; Malcolm Steward has successfully used an Aro to track many a heavy track, while I know of others who plough their Metallica albums happily with an Ekos; it’s a matter of choice.

F. B. Davies

In summary - help! My

QR

My system is a Roksan Xerxes/Tabriz/Linn K18, Meridian 206B (A-T 615 Interconnect) and 6000CP/Porsche to a Powerboat. The Meridian 206B can be upgraded to the Meridian’s tidy output, combined with the clean CD input of the Audiolab could tend toward being bright, especially if used with the wrong cable. I am not too conversant with the Audio Technica interconnects, but they could be the flaw, unless the brightness that you complain of is that which is inherent in the medium itself. Audioquest Quartz would probably help to ameliorate this, as it is a solid core cable sometimes helps to take the sting out of an overbright signal, Furukawa FD-1010, Moss Lely Line Black, Audio Note Silver or Audioplan Care Music Super X-Wire. All of these cables have performed very well with a CD signal in my system.

Question 1. Yes, the Tabriz will be improved by the zl ‘turbo-charging’. It will improve bass depth, as well as clarifying matters in terms of detail. Question 2. The 206B CD player is not known for its brightness. Question 3. The 206B CD player is not known for its brightness. Question 4. Change the stands to Epos’ or others. Question 5. Change speakers to Epos 14, KEF R103/4, Castle Chesters or Heybrook Sexets. (Two of which you reviewed last month. Perhaps you have other ideas: have you got hold of a new pair of Dalis yet?)

6. I’m considering putting 12mm plate glass shelves on the Appolo stands; or would a Mana table be better for the turntable? 7. Audiolead’s new 8000M - but with which speakers? I need help! My listening room is 15x10x8 feet, I listen to Pop, Folk and Classical and have say £1,000 to upgrade, but more if required.

D. P. Drew, Droitwich Spa, Worcestershire

So many questions! I think that it would be a good idea to answer each question in turn, and then to draw a conclusion from the answers we come across. So:

Question 1. Yes, the Tabriz will be improved by the zl ‘turbo-charging’. It will improve bass depth, as well as clarifying matters in terms of detail.

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Question 7. Audiolead’s new 8000M - but with which speakers? I need help! My listening room is 15x10x8 feet, I listen to Pop, Folk and Classical and have say £1,000 to upgrade, but more if required.
Targets), although I do not believe Tannoy Sixes, which may fit the bill, although they have not yet been tested by us. Given the budget that you mention at the end of the letter, I would suggest the Q90s would give you more leeway. It is impossible to achieve real deep bass and slam without a monstrous bass cone - 12 to 15 inches is a good starting point. Most hi-fi loudspeakers do not go near this territory, as it is very difficult to get a large cone to perform without drastically colouring the sound. The KEFs and the Tannoy’s get close, but they still do not achieve the sort of slam and intensity that a good horn, like the Tannoy Westminster, can give out. The nearest to this drive, at a more realistic price level, is something like the Impulse Horns.

Question 6. Do not, under any circumstances, attempt to put a thick glass shelf on an Apollo, the same holds true for all stands and tables designed for use with medite boards. The Mania, and its ‘metoo’ clones, have been designed to work with a glass platform and have overcome the problems that glass creates. This is why the Mania table uses L-section frame, instead of box-section, as found on Target, Sound Organisation, Appollo et al.

Instead, go for the Mana table. Start with a Reference table for the turntable and a power supply cable sitting under the Reference table. After this, add a similar table for the CD player and eventually go for the equipment tables for everything else, if it is at all possible. You will be surprised at how much improvement can be had from each table in the chain. Some of those who have never had the Mana bug, have gone as far as Mana-ing their TV and video, with successful results. Soon, I hope to perform the same experiment with my coffee percolator.

Question 7. Audiolab’s 8000M monoblocks do improve on the 8000P stereo amplifier, but I feel that you are so confused by your system at the present, that this would be the last thing I would change. It would simply add more of the same; in a well-sorted system, this would be the icing on the cake, but it may amplify (or at least slightly intended) any problems that you are currently encountering with your system.

Still confused? Try this, for example, as a major upgrade:

1) Mana Reference table (£300),
2) Roksan Tabrizi upgrade (£115)
3) Furukawa FD-1010 interconnect cable (£85),
4) KEF Q90 loudspeakers (£649), using Furukawa loudspeaker cables; FS2T-20P (£7.50) to tweeter,
5) FS2T-35P (£13.50) to bass.

Assuming that the cable runs are five metres long, this comes to £1,359. With this amount of money, I can’t imagine that there would be any mis-match if the NVA was used instead, however. Albarry’s reputation for solid build quality, as well as pleasing aesthetics make it a good alternative to the NVA. I’m afraid that I have not listened to the Iraklis as yet, so I’m in the dark as much as you here. AS

I would like some advice about upgrading my amplifier which at present is a Cambridge C100/A100 combination. The rest of the system is an Aiwa F990 cassette deck, a Rotel RT870L tuner and, the main source, a Meridian 200 transport and a Deltec Little 200 QAC. The speakers are AEI’s on AE stands. I am thinking of getting a passive control unit - possibly NVA’s PS0 and spending up to £1,600 if I have to on a good power amp. which will give a clear detailed sound and last for some time. I am considering monoblocs from NVA - A80s - and Albarry - 1008s - and the Iraklis stereo amp.

I would be grateful for any suggestions or comments on my proposals. For a little more than a pair of A80s I could buy four A70s and bi-amp. Is it worth it?

Eamonn Griffiths,
Branton, Lincoln

The NVA passive is one of the best models that I have encountered. Its natural partners are the A70 and A80 power amplifiers, but only if used with NVA’s own loudspeaker cable. I would suggest going for a quartet of A70’s to partner the AEI’s, as the loudspeakers perform at their best when bi-wired/bi-amped and NVA’s amplifier design does not allow for bi-wiring at all. I have not tried the Albarry 1008 power amplifiers with AEIs, but I have been reliably informed that they work well. I would imagine that the smooth sound of the Albarrys would balance out some of the stridency that the AEIs can sometimes produce. The Albarrys could be used with their own passive preamplifier; I can’t imagine that there would be any mis-match if the NVA was used instead, however. Albarry’s reputation for solid build quality, as well as pleasing aesthetics make it a good alternative to the NVA. I’m afraid that I have not listened to the Iraklis as yet, so I’m in the dark as much as you here. AS

The LPT is more than capable of supporting an amplifier like the Nait. Either the Naim, a Cyrus Two, Audiolab 8000A or similar would be an excellent choice. Loudspeakers that would suit are obviously dependent on your tastes and the choice of amplification, but Epos ES IIs, Royd Sintras and Harbeth HL-P3s are good starting points.

Moving over to the CD player, both the Philips and the Arcam player have a vaguely similar character to the LPT, with the distinctly characterful nature of the Musical Fidelity player causing it to lag behind the others, a little. My personal preference would be for the Arcam Alpha ACD1, although ultimately I think that the Philips CD-850 Mk2 is slightly more neutral. The Arcam has a warmth and bloom to the bass that is musical and enjoyable, but not strictly true to the original. It might also be worthwhile while looking at players such as the Pioneer PD-9700, the Rotel RCD 955 and the Micromega Leader, although this last may be slightly outside the price range. AS
Hi-Fi World
Special Audio Accessories

A range of high quality audio accessories selected by us for their usefulness and effectiveness. A new selection of TDK accessories has been added to the collection.

KONTAK
Contact Cleaning Fluid
Kontak is an effective two part cleaning solution that removes contaminants from electrical connectors of all sorts. It is applied with pipe cleaners supplied. Clear instructions list the most sensitive contacts that need treatment in a hi-fi system, although items like fuses which are not mentioned should also be treated.

The dirt that Kontak removes is clearly visible on the pipe cleaners, demonstrating just what degree of contamination contacts have reached and what Kontak is achieving.

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The dirt that Kontak removes is clearly visible on the pipe cleaners, demonstrating just what degree of contamination contacts have reached and what Kontak is achieving.

Users commonly express surprise at the amount of dirt and contamination Kontak removes. After application, a system regains its original life, sparkle and vigour.

KONTAK PRICE: £21.20

ANTI-STATIC RECORD SLEEVES
Translucent antistatic record sleeves from either Tonar or Nagaoka, according to availability. A surface treatment makes them anti-static, lessening dust attraction. This helps keep records pristine. They are supplied in packs of fifty. We suggest you regularly change these sleeves in order to prevent trapped dirt contaminating records, especially fine dust of the sort left by brushes - is removed completely. This is an effective way to dry clean a record.

LP SLEEVES (50) ... PRICE £7.50

NAGAOKA CD CLEANING KIT
As with cassette deck cleaning kits, we don't recommend the 'cogs and wheels' cleaners and choose not to sell any of them. Tests we have carried out with a Cambridge CD-1 CD Quality Control Unit clearly show that careful manual cleaning is the most effective way of removing all types of surface contaminants without causing damage to the disc.

NAGAOKA CD CLEANING KIT .......... £10.50

NAGAOKA ROLLING RECORD CLEANER
The big drawback with most record cleaners is that they fail to remove all types of dirt. Brushes pick up fluff, but they redistribute fine dust around the grooves, causing noise build up. Nagaoka’s rolling record cleaner actually lifts dirt from the bottom of the groove - even fine dust. It uses a peculiar form of sticky coating on a soft foam backing. Dirt of all types - especially fine dust of the sort left by brushes - is removed completely. It is lifted from the record's surface, and no deposits are left behind. This is an effective way to dry clean a record.

ROLLING RECORD CLEANER ............. PRICE £10.20

PIXALL MK II RECORD CLEANER
Simple in both function and design, and made in the U.K., this uses a roll of sticky tape which lifts the dust out of the record groove. Three or four passes will clean the record very effectively, and can reduce static at the same time.

After each pass, the dirty length of tape can be peeled off and thrown away, reducing the risk of any gritty particles picked up being ground back into the vinyl. When the tape roller runs out, a replacement is simply clipped in. This is one of the most effective ways of cleaning an LP.

PIXALL MARK II .. PRICE £10.75

SORBOTHANE CD FEET
Four big, round rubber feet, 50mm in diameter and 18mm deep. Made from a soft, slightly sticky feeling form of artificial rubber known as Sorbothane, these feet have the peculiar ability to soak up vibrational energy, due to their high internal kinetic losses. Some people go nuts with them, swearing they improve everything, from the TV to the fridge! We sell them for use (as intended) with CD players, turntables and various other hi-fi components that might be sensitive to vibration. They improve sound quality by providing a more stable platform. Well-nutty and a lot of fun.

SORBOTHANE CD FEET ................. £27.95

Remember that CDs must not be scratched - even finely. Tests showed that the Nagaoka kit was the best all round cleaner. It has a solvent and a chamois leather pad which, together, bring the CD surface back to almost as-new condition.

CD CLEANING KIT .......... £10.20

PIXALL MARK II .. PRICE £10.75

DRY STYLUS CLEANER
A method of keeping your stylus sharp and bright for perfect tracking without using fluid. We're offering a whole sheet of card with an aluminium oxide micro-abrasive coating.

After each pass, the dirty length of tape can be peeled off and thrown away, reducing the risk of any gritty particles picked up being ground back into the vinyl. When the tape roller runs out, a replacement is simply clipped in. This is one of the most effective ways of cleaning an LP.

PIXALL MARK II .. PRICE £10.75

DRY STYLUS CLEANER ... £1.95

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DRY STYLUS CLEANER ... £1.95

AUDIO TECHNICA
GREEN CD RING STABILIZER
These are detachable green rings which are fitted round the circumference of the Compact Disc. The non-slip material allows the disc to be picked up without...
touching the playing side and leaving fingerprints. It also raises the disc slightly from any surface it’s placed on, avoiding scratches if you don’t replace it directly in the jewel box, as you should. It also absorbs stray red laser light, so improving its stability and reducing interference signals reaching the laser and improving sound quality. The green coating is applied to outer and inner edges. It has been formulated by one of Japan’s largest companies, Mitsubishi, to be harmless to the CD itself.

**LASAWAY GREEN PEN ...£7.50**

**GOLD PLATED SPADE CONNECTOR**

For amplifiers with loudspeaker screw terminals, here is a heavy-duty gold plated spade connector. It has the same unique axial clamp connector as the 4mm plugs described above.

**SPADE CONNECTOR (4) £10.00**

**ARCAM RCA PHONO PLUGS**

Specially made in Japan to Arcam’s specification, this heavy-duty phono plug will accept audiophile cables up to 7mm in diameter. The 36mm long body is nickel plated and the contacts gold plated. Superbly built, we supply in polarised pairs with one/two ring end identity to allow send/receive ends to be established to take into account directionality. These plugs must be soldered with care to cables.

**RCA TYPE PHONO PLUGS (4) £15.50**

**AUDIO TECHNICA CD LENS CLEANER**

Here’s a product for smokers in particular. However, seeing the peculiar haze that can coat windows even when there are no smokers about suggests this clever little gadget is a necessity for one and all. It is a laser lens cleaner for your CD player, beautifully made by Audio Technica. Contained in the pack is a disc with fine brushes on it. Each brush takes one drop of cleaning fluid, then it is inserted and played. The brushes gently clean the laser lens, removing oil, grime, dust and other airborne deposits like nicotine (ugh!). Audio Technica recommend use once a month.

**CD LENS CLEANER £15.30**

**GOLD PLATED 4MM BANANA PLUGS**

We have a new style, heavy-duty, gold plated banana plug with a unique type of axial solderless connection for loudspeaker cables. The wire is stripped back and pushed into a clamping collar, which is then screwed down tight. It will accept cables up to 6mm outside diameter and up to 4mm conductor diameter, holding them firmly and more evenly than the usual grub screw arrangements. They are supplied in a set of four.

**BANANA PLUGS (4) £8.00**

**SIDE ENTRY 4MM BANANA PLUGS**

Similar to the plugs described above (i.e. gold plated, heavy duty) but with side entry for heavy loudspeaker cables of up to 5mm conductor diameter. The screw clamp grips the cable over its full diameter by applying pressure with a non-rotating cylindrical slug.

**SIDE ENTRY BANANA PLUGS (4) £10.00**

**LASAWAY GREEN PEN**

When rec laser light hits the silvered reflective surface of a disc, some of it scatters and is later reflected back off the disc edges, causing optical interference. Because green is far removed in the light spectrum from red, an opaque green coating effectively absorbs this scattered light, reducing interference signals reaching the laser and improving sound quality. The green coating is applied to outer and inner edges. It has been formulated by one of Japan’s largest companies, Mitsubishi, to be harmless to the CD itself.

**LASAWAY GREEN PEN ...£7.50**

**AUDIO TECHNICA ELECTRONIC STYLUS CLEANER**

Scared of damaging your stylus when cleaning? Try this amazing little device - an electronic stylus cleaner that vibrates gently right off the tip! Powered by a small AA battery, it’s a doddle to use and safe too. Just rest the stylus on its high-speed vibrating brush and watch dirt get driven off automatically.

**ELECTRONIC STYLUS CLEANER £19.95**

**LASERGUIDE**

The clear polycarbonate of Compact Discs scratches easily. Measurements we have carried out show that scratches, being closer to the silvered reflecting surface where the laser beam is focussed, are much more of a problem than dust, finger marks, etc. They demand heavy error correction and often overwhelm a players capacity to substitute in spare programme information held redundantly for this purpose. Interpolation is then used to cover up the problem - which means guessing what the missing signal was like in order to fill in the gaps.

The only answer is to fill in scratches, lessening their impact to act as optical prisms capable of scattering the laser light. LaserGuide is an optically engineered silicone treatment that claims to do this, reducing randomly reflected light by up to 50%. It is claimed that LaserGuide improves stereo depth and openness. Just apply to the disc surface.

**LASERGUIDE £14.95**

**AUDIOQUEST OPTICAL LINK Z**

This is a wide bandwidth, ultra high performance optical cable for digital links, made by Audioquest. The most common use is linking a CD transport to a digital-to-analogue convertor. It is available in 1 metre and 2 metre lengths with conventional TOS-link connectors.

**OPTICAL LINK Z (1M) £69 (2M) £99**

**AUDIOQUEST QUARTZ INTERCONNECT CABLES**

A fully balanced analogue signal cable with heavy duty, gold plated phono plugs and advanced Quartz Hyperfiz cables using polypropylene insulation. The Quartz cable we have chosen from our own experience as a fine sounding type. It uses FPC-6 ultra-pure copper (99.99997%) and the plugs are welded.

**AUDIOQUEST QUARTZ CABLE 1METER LENGTHS £97/PAIR 2METER LENGTHS £120/PAIR**
SWEATSHIRTS AND T-SHIRTS
A whole new range printed with "Hi-Fi World" and our slogan "The Magazine for Enthusiasts" both front and back to prove to everybody you read probably the best hi-fi magazine in the universe. The sweatshirts and T-shirts come in white, grey, black and navy-blue in Large and Extra Large sizes; track-top one-size sweatshirts (with hoods).

SWEATSHIRTS £12.00
HOODED TRACK-TOPS £15.00
T-SHIRTS £7.99

RECORD STORAGE CUBE
This cube has been designed by us to hold roughly one hundred LPs. It has an internal width of 37cms. Internal height is 32.5cms and depth 32cms. The cubes can be stacked or placed alongside each other to increase storage - and they can even be used as seats!

Strongly made from 15mm medium density fibreboard (MDF), the panels are milled to have strong side joints. We have specified a durable black paint finish to give it a smart, yet unintrusive appearance. The screws are self-starting, but clearance holes are pre-drilled. It comes in a flat pack with screws and Allen key for easy home assembly.

RECORD STORAGE CUBE PRICE £42 EACH

FREE!
20 RECORD SLEEVES WITH 2 CUBES
50 RECORD SLEEVES WITH 4 CUBES
FOR 6 CUBES, JUST PAY FOR FIVE £210
FOR 8 CUBES, JUST PAY FOR SEVEN £294

CD CABINET
Designed to match the Record Storage Cube, in the same black finish. Made of strong 15mm MDF, the cabinets can be stacked on each other, or on top of our Record Cubes. 400mm long, 360mm high and 150mm deep, a central shelf allows up to seventy CDs or forty two cassettes to be stored with space above for fingers to pull them out. Supplied flat-packed with screws and Allen key for easy home assembly. Price includes postage and packing.

CD CABINET £29.95

A NEW RANGE!

TDK CLEANING KITS
A comprehensive range of cleaning materials from TDK for cassette decks, Compact Discs and even connectors. There are two head cleaning kits. One, the CK-A1, includes two bottles of fluid of different compositions for the heads and the rubber pinch wheel, and specially shaped cotton buds for applying it. The CK-TB pack has similar cotton buds but with a single bottle of dual-purpose liquid.

TDK offer three cleaning pens, about the size of marker pens, colour-coded to avoid mix-ups. Each has a soft double-ended replaceable shaped tip. The Audio Head Cleaning Pen is for cleaning cassette heads, the CD Cleaning Pen for removing finger marks from CDs, and the A/V Connector Cleaning Pen for polishing up audio plugs and sockets.

A neat little CD cleaning kit contains a bottle of specially developed fluid and a soft pink cloth which can be used for removing grime and stains. Finally, a dandy CD cleaning tool with two soft pads at either end of a blue holder, one for applying the cleaning fluid supplied, the other for drying the CD off afterwards. Both pads of the Wet and Dry CD Cleaner are replaceable.

TDK HEAD CLEANING KIT CK-A1 £5.50
TDK HEAD CLEANING KIT CK-TB £4.65
TDK AUDIO HEAD CLEANING PEN CP-AH1 £5.00
TDK CD CLEANING PEN CP-CD1 £5.00
TDK A/V CONNECTOR CLEANING PEN CP-CR1 £5.00
TDK CD CLOTH CLEANING KIT CD-C2TP £6.50
TDK WET AND DRY CD CLEANER CD C1TB £8.75

© 1992 Accessory Offers
Paul Donovan, who writes on radio for the Sunday Times, fell in love with the wireless as a boy. The Radio Companion, a quarter of a million word A-Z encyclopedia on everything to do with sound broadcasting since the twenties, proves his love affair with the ether hasn’t diminished over the years.

It is almost impossible to dip into this compendium without coming up with the questions for a do-it-yourself Radio Trivial Pursuit. What radio station’s DJ’s do it standing up? (Atlantic 252 - their control desks are the same height as a kitchen worktop.) What was the first Outside Broadcast? (Mozart’s Magic Flute, from Covent Garden in 1923). If you want to know how many celebrities were marooned on a Desert Island the Radio Companion is where you look.

There is plenty on the wireless days, there are entries on programmes and personalities right up to the nineties. The paragraphs on Pirate radio stations are a history of the phenomenon in themselves. Ones like Radio Jackie I remember, and anyone over thirty will remember Radio Caroline, but Radio 390, run by thriller writer Ted Allbeury from an anti-aircraft fort in the Thames estuary was new to me.

The later Pirates like the now respectable and licensed Kiss FM aren’t neglected either, although Kiss’s entry doesn’t mention it had a legal franchise in Paris before the British airwave allocators would accept the station. I’d love to go on, but I’d end up quoting the entire book. The book is not just an exercise in nostalgia as the publishers say, this is the first “Radio Halliwell” and it’s wonderful. If only we could hear, as well as read about, Jack de Manio’s spectacular inability to tell the time on the morning “Today” programme in the days before John Timpson and Brian Redhead. Apparently one listener crashed his car on hearing a wildly inaccurate time-check on his way to work. The entry on John Snagge raised a chuckle too, quoting his famous blunder in a fog-bound boat-race commentary: “I can’t see who’s in the lead, it’s either Oxford or Cambridge.”

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The Radio Companion is not a coffee-table book. It’s a mug of cocoa and-curl-up-in-front-of-a-warm-fire book, which is exactly how I’ve spent my odd spare hours in the evenings dipping into it since it came through the post. A warm valve-wireless glow and a consuming delight in radio has suffused Paul Donovan’s style, light but informative. And he has something fascinating on every page.

**HI-FI WORLD SPECIAL AUDIO ACCESSORIES ORDER FORM**

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All prices include postage & packing in the UK only.
COMPACT DISC

ARCAM ALPHA ACI

360
Offers a warm, full-bodied sound with big bass.

PHILIPS CD-850

400
All the finesse of top-quality Bitstream.

TRANSPORTS

ARCAM DELTA 70.3

699
Arcam's first Bitstream player. Its refined, but beautifully detailed sound sets the standard at the price.

MERIDIAN 206B

1950
Every level. Meridian player. Detailed, with wide soundstage, but somewhat lacking in 'joie de vivre'.

NAIM CDS

2393.50
The current talking point in the world of hi-fi. A worthy contender for the best CD player in the world throne. Perfect partner for a Naim system.

ARCAM BLACK BOX I, II AND III

£210, £260, £360
Three solid performers that can transform a mid-price Compact Disc player with a digital output. They get progressively better as the price gets higher.

DETEL LITTLE BIT

300
Sets up a wide, open stage and places a captivating performance within it. Spectacular Bitstream technology at a very low price.

AUDIO ALCHEMY DIGITAL DECODING ENGINE

£374
Paperback sized Bitstream convertor that offers superior performance. See option to earlier versions.

DETEL PCM SERIES

£595
Spacious representation with strong embodiment of performers. Natural and relaxed, but superbly refined and subtly impressive.

RECOMMENDED PRODUCTS

ROKSAN XEREXES

695
Fast, entertaining, and clean, some have described the Roksan (especially with its Arzrzes phono pre-amplifier) as almost CD-like in presentation. A good alternative to the LP12.

VOYD VALDI

699
Similar to the Pink Triangle, the Valdi is a very expressive performer, with a deep bass that sneaks up on you. Matches Audio Innovations equipment well.

PINK TRIANGLE ANNIVERSARY

1175
One of the finest sounding turntables of its production, the Anniversary takes the listener nearer the recording studio than almost any other machine. Suits the same arms as the PT Export.

TOWNSHEND ROCK REFERENCE

1995
Great sounding, pitch stability and timing. The Rophone has a bass performance that is deep and impressive.

TONEARMS

REGA (MOTH) RB350

£78
Excellent value for money. The one piece arm.

REGA RB300

£115
Little to beat this arm at the moment. It appears in some outrageously expensive turntable packages without sounding out of place. Very slight softening of notes, when compared to the finest.

LLINN AKITO

£137
Different presentation to the Rega arm. Not quite as expensive as the Rega CM1. However, still shines with cheaper MM's (especially on all Linn turntables).

LINSAR LIVING TRACK

£165
Good bass and not too fizzy for the price. Works well in Roksan or Naim systems.

LITTOR'S NAVERTAX

£197
A sort of 'Turbo' Ikot, the Ekos improves upon the strengths of the Tik-Tok, making it more transparent and dynamic, without becoming overly edgy.

SMF SERIES

£247
Probably the finest built of all pick-up arms, the V seems to have little to criticise about it. On the right turntable. Some suggest that it can sound polite; it performs (without getting in the way of the music) with grace and artistry. Strong soundstaging properties, it does not appear to have the problems associated with other arms at frequency extremes.

CARTRIDGES

MICHIEL GYRODEC

£659 (with R03B)
Highly understated turntable. Impressive build quality, virtually unmatched by the other British high-end manufacturers. Very, solid sound. Plenty of bass and good soundstaging. In some systems it can sound a little bland; in others, excellent. Better than ever with its new power supply.

PINK TRIANGLE PT EXPORT

£674
Terrific soundstaging abilities, good bass and a neutral performance that improves upon the LPT considerably. Works with all arms listed with the LPT, plus the SME range.

LINDON DEK LA12

£792
Stable, versatile, and well suited to all types of music. They get a permanent place in our reference system.

DENON DL10

£70
Moving-coil and moving-magnet. Old-school - it has had for quite a lengthy lifespan - this mono monstal-toskeleton-col- lared mono input cartridge has stunning detailing and a fine delicate sweet sound.

LINDON K9

£89
A cart that will click and feedback in/new arms in some systems. All the finesse of top-quality Bitstream.

AUDIO TECHNICA AT-OC1

£92
Needs an exceptionally good front end to sound good. Its resolution of detail is very good. A cautionary reminder to insist on it, as can sound raucous and far too much.

SHURE YST-V

£173
Excellent tracking moving magnet cartridge. The Shure offers some of the finest within the troika of MM.

ORTOFON MC SUPER

£270
Dedicated to the finest cartridges ever made. More music than studio.

AUDIO NOTE IOIV

£295
A clean, leak-proof cartridge. For the Audio Note/Audio Innovations user, the lo is almost impossible to beat, short of the more expensive lo Ltd.

ORTOFON MC5000

£1500
The information retrieval. Can resolve more detail from the plastic than almost any cartridge around. Solidly too analytical for some tastes.

HEAD AMPLIFIERS

MICHIEL ISO

£293
There is really that much in the middle. The Astounding detail, solid, rock-solid images and air and space precisely in the right places (let the studio engineers) heard it. We were so impressed the lo now has a permanent place in our reference system.

CASSETTE DECKS

DENON DRH-400

£140
Strangely good, competent cassette deck is available. Plays prerecorded tapes well and produces acceptable recordings. Variable bias, wobbly speed.

TECHNICS RS-845

£180
Unusually speed stable, giving clean clear recordings. Poorer with new tapes. Plays pre-recorded tapes well. Good for piano.

NAD 623

£325
One of the best at the price; superb with pre-recorded and detail. Makes excellent recordings. Ackward to use.

TECHNICS RS-EX 506

£170
The best price / performance / price and a sound quality that is near unbeatable at twice the price! Near-Nakamichi Exiona for pocket-money.

90
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HI-FI WORLD

MARCH 1992
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AKAI GX-52 £200

Four band graphic equaliser from the GX head unit. All tape types; good reply too. Excellent all round.

NAD 6430 £220

Unbeatable ability with prerecorded tapes and makes very stable recordings on all tape types.

JVC TD-54I £280

and makes very stable recordings on all

AKAI GX-52 £200

good, if somewhat overpriced, all round

with prerecorded tapes too, but slightly

Especially good with metal tape, with

DENON MC-41 £260

which it makes fine recordings. Excellent

a wonderful open clarity that belies its

Esoteric source components. As with the

One of the most controversial and popu-

ARCAM ALPHA 3 £200

amplifiers today. Excellent performance, suitable partner for most equipment.

CREEK 4005S £280

Easy to live with, the Creek seems better suited to LP than CD.

PIONEER A-400 £230

On the most controversial and popular

430 £230

preamp amplifier. Minimalist appearance, suitable partner for most equipment.

ART AUDIO TEMPO £229

Beautiful looking valve power amplifiers. Not powerful, but very sweet and involving, especially when used in tickle operation.

JOHN SHEARNE PHASE ONE £398

Precy, valve-like amplifiers with a sweet, lucid sound. Highly suited to neutral sound equipment.

LINN KAIRN-LK20/SPLARK £295/655/639

Top flight Linn amplifiers. A bargain forward for some tastes, but very detailed and designed with the future in mind.

MUSICAL FIDELITY SA-476600 £900

Imposing and exciting. Not for a car engine, the SA-470 appears to have no limits whatsoever (more than can be said for those who have to lift it).

LOUDSPEAKERS

GOODMANS MAXIM II £90

Fine ‘giant killer’ loudspeaker. Not as small a sound as would be expected from a small unit. Will not compromise expensive equipment.

GOODMANS M500 £130

Fine budget loudspeaker. Not very subtle, but highly efficient, even-handed and dynamic. Good for loud rock.

NAD 8225 £149.95

Very neat, open and clear sound for the money.

MISSION 775I £169

Terrific faln loudspeakers. Easy to position, easy to drive in to sit in front of, if not the most refined of treble performances.

NAD 8100 £299.95

Fun, snappy loudspeaker that drives deep and loud without shouting too much.

EPOS ES1 £330

Few match the virtues of this class. One of the finest at the price. Great imagery, weighty bass without becoming overpowering. A goody!

ROGERS LS3/5A £350

Smooth, refined and open sound. Little real bass, but excellent soundstaging and phrasing. One of the finest classically trained loudspeakers around, only matched by the Harbeths at the price.

HARBETH HL/P3 £359

Souped-up, bi-vibral version of the BBC design, as typified by the Rogers LS3/5A. Even better imagery and clarity, especially on vocals. Best suited for Radio 3 and Radio 4 enthusiasts, the HL/P3’s lack a little in volume and a little depth to the bass. Not powerful, but very musical.

LINN KAN II £439

So called to prove that you can get a big sound from a little box. Incredibly fast, with a little in volume and a little depth to the bass.

NAD 800 £895

Fun, snappy loudspeaker that drives deep and loud without shouting too much.

PROAC STUDIO I MK 2 £612.25

Since the price reduction and sonic improvement, the Intek has become a worthy competitor for the Nair., but has more power.

ART AUDIO TEMPO £229

The obvious upgrade for owners of Linn Kans. Need a lot of power to drive properly. Active version also available.

TDL STUDIO 1 £599

Smallish transmission line loudspeaker. Good imagery, well focused (when positioned properly) and some of the deepest bass you can imagine. Slightly room dependent.

KEF Q90 £649

Very very efficient, very dynamic and capable of delivering a visceral experience for some. The best loudspeakers I have heard. Three of us are keen of KEF’s finest loudspeakers.

NAIM IBLS £995

Small, floorstanding loudspeakers, best suited to Naim’s style. Closest and excellent in the right room (being fast, expressive and tight), but thin and reedy in others. Can be driven passively or actively.

AUDIO NOTE AN-A £799 (Copper Wired) £999 (Silver Wired)

Excellent soundstaging, a natural performance and an uncanny ability from these re- tros of the Snell design. Silver wiring is a worthwhile upgrade.

HEBYROCK SEXET £899

Revealing, lucid floorstanders. Not smooth, but tight and fast-paced. Need careful partnering with ancillary equipment.

KEF REFERENCE 103/4 £995

Carries all the hallmarks of the small box recording and every detail in the hi-fi system (or the room), the 103/4 have imagery and coherence and can go very loud indeed.

LINN KABER £1198

The obvious upgrade for owners of Linn Kans. Need a lot of power to drive properly. Active version also available.

TDL STUDIO 1 £599

Large, capable of moving a lot of air. The best loudspeaker for organ music, short of the really big TDL’s. Impressive, awesome and a bit frightening.

NAIM SBL £1537

Highly suited to the Naim system, the SBLs are impressive, dynamic, powerful and expressive sounding, especially in active mode. May not suit everyone but has an intense experience for some people!

PENTACOLUMN £1695

Active column loudspeakers, again using Bicolor units, very good, and of an already excellent sound of the cheaper ProAc Studio imagery, small box amplifier dependent. Suits valves well.

QUAD ESL-43 £2072

Large electrostatic loudspeakers. Imagery and detailing second to none, but lacking in bass. An academic among loudspeakers.

LINN ISOBARICS from £2190

Few who listen to isobarics working properly cannot be fooled into submission by their gun-wrenching dynamics. A bit larger than life at times. If the Quad is an academic, the ‘barics are the Mike Tyson of the loudspeakers.

NAIM DBL £6000

Huge, active-only loudspeakers, which makes them one of the most awe-inspiring and cost-effective devices of all time. Must have bass boost (stand)! Can produce immense sound pressure levels. Not for the squeamish!

MERIDIAN DA4000 £7500

The pinnacle of Meridian’s research into active loudspeaker systems. Makes other systems seem primitive by comparison. Once set up, it becomes one of the easiest systems to use. Very controllable quick in the overall sound is slightly bright in some rooms, but is otherwise intensely dynamic and powerful.

TANNINO WESTMINSTER ROYAL £10000

Vast full-range horn loudspeaker systems. Loudspeakers that are very popular in Japan. Incredibly dynamic and detailed, with a rich sound and efficiency that lends itself toward valve amplification.

World favourites

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DENON TU-260 £100

Sensible and has a clean, balanced sound. Amazing value.

NAD 4225 £159

Tiny, spacey presentation; smooth and easy sounding. The best under £200.

ION SYSTEMS PFM-1 £159

Tiny, spacey tuner with good stereo, deep bass and excellent detail. Probably the cheapest ‘real’ tuner on the market.

ONIX BWV-1 £395 (exc power supply + lead)

Great partner for the QA215, as it can be powered from the amplifier, the tuner has a wonderful open clarity that belies its price.

QUAD PH4 £399

Revealing and a ruthless way with anything other than high studio quality from the transmitter.

NAIN NAT-02 £853

Little box, big money, dead good. Try and find better unless it’s a .

NAIN NAT-01 £1377 £1377 all tape types. If you want better radio reception, go and live in the BBC’s studio.

AMPLIFIERS

NAD 3020 £149.95

Well known budget classic. Its crown has slipped a bit of late, but it still cuts the standard to be met. Distinctive ‘NAID’ sound.

DENON PMA-350 £169.99

The upsurer to NAD’s throne. Packs a lot of punch for the money. Phono stage not as good as the rest of the amplifier.

ARCAM ALPHA 3 £200

Lean and lively, with an astonishing amount of detail built in; the best at this price for line-level sources and won’t disgrace an LP collection.

MISSION CYRUS ONE £200

Very neutral. Good, if somewhat overpriced, all round with prerecorded tapes too, but slightly

MISSION CYRUS ONE £200

Excellent sound, especially when partnered with extremely exotic source components. As with the PMA-350, weakest link is the phono stage.

NAD 4225 £159

Tight, fast, great stereo and good dynamics. Few little boxes come close.

NAD 1000+2100 £179.95/289.95

Well-built amplifier with a strong follow-through. A music machine for the ‘Naim’ hobbyist.

NAD 3020/21 £149.95

Very neutral. Good, if somewhat overpriced, all round with prerecorded tapes extremely well too.
Golden Dragon
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To attain a premium tube, sonic quality must be designed in from the start. As with any fine audio component, vacuum tube design is both an art and a science. With the closing of the legendary tube manufacturers it seemed that the magic combination would be forever lost.

Fortunately, a group of British audiophiles and engineers have worked diligently with the Shuguang and Beijing tube factories in China to create tubes of the highest sound quality and reliability. No aspect of design or performance has been neglected. Countless prototypes were auditioned in the creation of custom audio tubes that rival the finest ever made. The results of these efforts are now available as Golden Dragon precision audio tubes.

"Judging by the quality and sonic superiority of the Golden Dragon 12AX7 and EL34, this venture is the best thing to have happened to tubes since the heyday of the likes of M-O Valve and Mullard... the Golden Dragon goal of premium tubes rivalling the best ever made appears to have been realised."  Dick Disher, Stereophile. Vol14 No.11 November 1991

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Come and see why!
CHAPTERHOUSE
Whirlpool
DEDICATED DEDCD0001

Daresay I'm a trifle late with this one as I have to confess I was attracted to the debut Chapterhouse LP when first I spied the beautiful cover in a West London bargain bin basement. That said, this is a cracker of a debut, jam-packed with music as sinuously sensual as the long haired pussy (cat) which adorns the sleeve. At first nearing the group's dense maelstrom-of-sound production is not a little unlike the sounds achieved by My Bloody Valentine (q.v.) using similar effects. On the whole though, Chapterhouse are far more accessible and direct, and ought therefore to appeal to an even larger audience.

Songs like “Guilt”, for example, begin with a more or less orthodox rock arrangement before leading the listener into territories new; and “If you Want Me”, with its isolated guitar and solitary chimes is a distant cousin of the Velvet Underground’s “Sunday Morning”, which is no bad thing. “Falling Down” proceeds via sinuous wah-wah guitar and severe bass-line to underpin the ethereal (if lyrically all but unintelligible) vocals. Not a record most people will want to play every day, perhaps, but a distinct and welcome debut for all that. Keep them bargain bin eyes peeled.

MY BLOODY VALENTINE
Loveless
CREATION CRECD 060

The name was lifted from a Z-grade pulp movie thriller, the line-up - two per gender, half European, half British - is just too socio-politically spot-on for words. Add to that the fact that live appearances and records (a debut LP close on three years old, a pair of highly collectable EPs) are as scarce as curate’s eggs and cult’s the word amigos, I kid thee not.

At first hearing, MBV’s music - simple rhythmic structures overlaid by a dense soup of part-found, part-created soundscapes - appears both repetitive and dense to the point of unintelligibility. A few listens, however, and endless subtleties make themselves heard. Small wonder that this is the second vers on of the current long-player, an entire previous LP having been scrapped as unsatisfactory. Beneath vocals that have an eerie, wraith-like quality at times not unreminiscent of Julee “Twin Peaks” Cruse, lurk a plethora of wild rhythmic twists and turns. And when - as on the stunning “Looner” - the background maelstrom suddenly changes gear to be replaced by a chillingly familiar cascade of wicked guitar chords... well, the effect is, as they say, truly shattering. The only current band that come even barely close to MBV’s trademark discordant rhythmic thunder are New York’s Swans, most notably on parts of their majestic This Burning World LP. But that’s as close as anyone gets; this is music as mysterious and intangibly evocative as can be. So who on earth cares what the words are when the sounds they help to make bewitch one so? It’s as if they’d written the soundtrack to one of those quirky, dreamscape-setting stories by Jorge Luis Borges. Just as enticing, just as corner-of-the-mind’s eye tantalising. Dub this Electric Magic Realism and...
Mana Acoustics

You don’t need a degree in the bleedin’ obvious to hear the huge improvements.
Paul Hartley, Hi-Fi World, May '91

The Mana spirit level is one of the most useful turntable tweaker tools we’ve come across.
Jason Kennedy, Hi-Fi Choice, Feb '90

One could imagine that turntable, arm and cartridge had all been instantly upgraded.
Martin Collams, Hi-Fi News, July '90

I haven’t experienced such a startling improvement through changing a single component for a very long time.
Paul Messenger, Hi-Fi Choice, June '90

Several hours and many albums later I was even more convinced as to the worth of the Sound Frame.
Paul Hartley, Hi-Fi World, May '91

If you consider it in sound quality, instead of hardware terms, the Mana is a bargain.
Alan Sircom, Hi-Fi World, July '91

nothing less than a substantial leap forward
Malcolm Steward, Audiophile, Dec '90

Its magic seems to work on almost everything that rests upon its glass top.
Alan Sircom, Hi-Fi World, July '91

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you may be just part of the way there. This is a Velvet Underground for the Nineties, a Joy Division matured and grown, or... the permutations are endless. The truth is that what we have here are purely for the Nineties, a Joy Division you may be just part of the way you're looking for a record that'll acceptance is a moot point, but if ever achieve major crossover of the current era Whether they'll immediately distinctive sound-makers matured and grown, er... the good quarter-century, Neil Young's (if not more) then I'll wager this is it Ways, and several other hit-or-miss hits. and several other hit-or-miss genre forays in recent years.) In the last couple of years, and via the critically and publically-acclaimed Freedom and Ragged Glory LPs, Neil seems to be enjoying a new lease of life - witness the rave reviews already generally accorded this latest live collection of old and new songs recorded on tour with long-time support band Crazy Horse. I'm none too crazy about the set myself, if you'll pardon the pun. Lou Reed made a comment a while ago to the extent that when you're playing live you exaggerate everything - every gesture has to communicate as much as much musically as it does to onstage comportment, and this is where my main reservations lie when it comes to Weld. True that the sound quality and production are damn near faultless and that the aforementioned attest to a live show that sounds like it must have been great fun in the flesh. Only in the comfort of one's own hovel it appears that. Neil and company are trying that little bit too hard. The result is that everything - vocals, guitar solos, general playing and arrangements seem that little bit too much larger than life; a little - shall we say - strained. Add to that the fact that a great deal of the material herein - 'Cinnamon Girl', 'Hey, Hey, My, My' etc. - have made frequent appearances on previous Young Records and bootlegs, new converts and real Young die-hards will have every reason to be satisfied; the more selective among us will, I fear, have to wait until the next studio album.

NEIL YOUNG & CRAZY HORSE

Weld
REPRISE 7599 26671-2

For someone who's been around a good quarter-century, Neil Young's managed to retain his credibility better than most. True, like any old soldier he's had to endure the odd period in the wilderness. (There was an ill-advised Country album Old Ways, and several other hit-or-miss genre forays in recent years.) In the last couple of years, and via the critically and publically-acclaimed Freedom and Ragged Glory LPs, Neil seems to be enjoying a new lease of life - witness the rave reviews already generally accorded this latest live collection of old and new songs recorded on tour with long-time support band Crazy Horse. I'm none too crazy about the set myself, if you'll pardon the pun. Lou Reed made a comment a while ago to the extent that when you're playing live you exaggerate everything - every gesture has to communicate as much as much musically as it does to onstage comportment, and this is where my main reservations lie when it comes to Weld. True that the sound quality and production are damn near faultless and that the aforementioned attest to a live show that sounds like it must have been great fun in the flesh. Only in the comfort of one's own hovel it appears that. Neil and company are trying that little bit too hard. The

ICE CUBE

Death Certificate
FOURTH & BROADWAY
BRCD 510-656-2

Ice Cube, if my memory serves me well, is a former member of Public Enemy. His official title was Minister of Information, and, regrettably, the pseudo-political title is fairly typical of the worse excesses of the latter's para-military stance. To their credit (see last month's issue) Public Enemy are capable of making Great Records and their hearts are more frequently than not in the right place. I wouldn't go so far as to make the same claim for Mr Cube, who's a so-so rapper (i.e. he can't sing but his rhymes are better than most) with an unenviable bias towards every negative-ism you'd care to mention: racism, sexism, etcetera. Death Certificate would appear on a cursory listen to be a conceptual album of sorts, dealing with Big Topics such as Birth, Sex and Death, starting with the last mentioned of which there is an unnecessarily high amount among the Back youth of the US ghettoes. Now if Cube stuck to topics he all too obviously knows about, like the insensitivity and callousness of drive-by killings, then I'd be on his side. Even when he knocks fellow made-good rappers-turned-would-be-whites, as on "True to the Game", you can see his point. It's when he drops into numbskull machismo for its own sake ("It's the number one crew in the area/ Make a move for your gat and I'll bury ya") or, as in the heinous racism of "Black Korea" or the even more vile sexism of "Givin'

Up the Nappy Dugout" that I take the needle (or whatever) off the record and draw the line. The world's in a sorry enough state without numb-nuts like Ice Cube - so what if he puts all his profits into his own neighborhood if he isn't helping anyone else? - preaching messages of hate. This is the sort of recording that gives rap a bad name/It's dumb and it's lame...
The arrival of a clutch of re-issue CDs normally prompts Malcolm Steward to pass unpleasant comments about the record industry... but not this month.

Sandy Denny
Who Knows Where The Time Goes?
Hannibal HNCD5301 (3 CDs)
HNBX5301 (4 LPS)

Hannibal’s boxed set contains valuable recordings by a singer whose life was cut short by an unfortunate accident in 1978. Sandy Denny was a classically-trained pianist who turned to playing guitar whilst working as a nurse after leaving school. She started travelling round London’s burgeoning folk-rock circuit whilst attending Art School where her fellow scholars included Jimmy Page and Eric Clapton. Impromptu sessions with the then unknown Simon and Garfunkel resulted in them encouraging her to perform regularly. She subsequently went on to work as a solo artist and as part of respected folk-rock groups The Strawbs, Fairport Convention and Fotheringhay.

At first it was purely her strikingly effective alto voice which drew attention to her but she was soon writing poignant songs which boosted her status further still. It’s hard to believe that the second of these was “Who Knows Where The Time Goes?” a song recorded by Judy Collins as the title track of an album which went gold. Her music still influences singers today. The title track of Mary Black’s album “By The Time It Gets Dark”, for example, is a Denny song, which is featured on this compilation as a demo recording made at her home in 1976. She sings to her own accompaniment on twelve-string acoustic guitar and despite the rudimentary arrangement and recording the song’s incandescence beams through defiantly.

The variety of the material and the circumstances of its recording make this bounteously rewarding three-CD collection a real must-have for anyone who can be touched deep down by music. There are forty-three songs included and amongst that number are solo and group performances, live and studio cuts, previously unreleased tracks and performances, out-takes and demos. An excellent book of photographs and lyrics supplied with the discs is the icing on the cake.

Despite the sheer volume of songs in this set I found it disarmingly easy to work my way through the whole shooting match in one uninterrupted session. The highest of its high points are many but personal favourites include her duet with Linda Thompson on the Everley Brothers’
"When Will I Be Loved?", the aforementioned demo of "By The Time It Gets Dark", the demo of "Take Away The Load", and a spirited concert recording of her leading Fotheringhay through Chuck Berry's "Memphis, Tennessee".

The material for this release was compiled and produced by Hannibal’s Joe Boyd and Denny’s husband, guitarist Trevor Lucas. It was a job well done and the collection deserves to be an unmitigated success. Do yourself a favour and look out for it.

MUDDY WATERS
I’m Ready
BEAT GOES ON BGOCD108

• “Thank you very much. Here I go,” intones Muddy Waters enthusiastically as he and his band barrel into this album’s title track. And what a band he’s playing with! Johnny Winter and Jimmy Rogers join him on guitar, Walter Horton and Jerry Portnoy play some wicked harp, Pine Top Perkins tinkles the ivories, and Bob Margolin and Willie “Big Eyes” Smith lay down the sturdiest of foundations with bass and drums. However, there’s never a moment’s doubt that it’s Chicago’s premier bluesman who is in charge of the proceedings. The man who bought the blues out of the Mississippi Delta and plugged it into the mains electricity supply, constantly carves his path through the music to remind everybody just who is calling the shots. Waters was the blues equivalent to rock’s Frank Zappa in that all the guys with the meanest chops wanted to play in his band, but nobody, however talented, could or would steal a march on him. He was too highly respected to fool with.

His style is rough and hard: both his singing, which draws on that of Son House, and his abrasive, pungent guitar which pays frequent homage to Robert Johnson. This re-released album from 1978 is one of his finest and showcases the talent which influenced more nascent rock’n’rollers and R’n’B players than you could shake a forest full of sticks at. "I’m Your Hoochie Coochie Man" is the fifth track of nine and more than any other it resonates with motifs and devices that have subsequently graced thousands of recordings by bands the world over. The closing number is another classic, "Good Morning Little Schoolgirl", a cover of which first introduced me to Johnny Winter, one of Waters’ biggest admirers and the man who signed him to his Blue Sky label on which this Grammy-winning album was first released.

MUDDY WATERS
Muddy ‘Mississippi’ Waters
- Live
BEAT GOES ON BGOCD109

• Waters also received a Grammy award - his sixth - for this album, the follow-up to "I’m Ready", released in 1979. Also produced by Johnny Winter, this is my personal favourite of the two albums reviewed here. Only seven tracks are featured but none is shorter than four minutes long and one of them, ‘Deep Down In Florida’, steamrollers along for more than nine.

The disc opens with ‘Mannish Boy’, a concrete slab of electric blues written in 1955 which provided the soundtrack to a TV commercial for Levi 501s in 1988, five years after the singer died from a heart attack in Chicago. Listening to it performed live on this disc it’s almost impossible to reconcile the fact that the song is bellowing forth from a body fast approaching retirement age. Waters’ energy is quite incredible, his presence truly awesome. It’s almost as awe-inspiring as his slide guitar playing on track five, “Howlin’ Wolf”, which is hot enough to blister paint.

Throughout the seven tracks the album’s musical strength is compounded by the atmosphere which is as electric as Muddy’s blues. This is an album to excite and delight anyone with the faintest interest in whence contemporary guitar music drew much of its spirit and nutrition as an infantile form. It should be regarded as an utterly essential purchase and if you decide to buy just one of the two Waters’ albums reviewed here I’d suggest you make it this one. Maximum R’n’B! This disc goes way past the red line!
into the first track, called - how about this for pretentiousness - "Overture", when the sound coming from my Naim CDS stopped for an all-too-brief breather. GRP has some good artists on its roster and Benoit is certainly a capable keyboard slapper but the music to which he devotes his talents.

Shadows is yuppie CD fodder par excellence. If musical dynamics were dynamite here would stand eleven tracks without the combined combustive might to blow the CD's jewel case open. Music which is, in the humble opinion of your correspondent, totally devoid of grace, passion and emotion. The aural equivalent to a draft of Customs and Excise is more fun than his VAT return. And sorting out processing another article or sorting out one's payments to Her Madge's has a certain charm which might be missing.

Jaco Pastorius
Jaco Pastorius
EPIC EPC81453

This isn't an official re-issue as far as I know, and I didn't have time to do any research because I only picked it up about an hour or so before this copy was due to be committed to floppy disk and mailed to Hi-Fi World. I had gone down to The Record Shop (66 Fife Road, Kingston, Surrey, Tel 081 546 3880) to see if its proprietor, Tim Bright could furnish me with any new releases to bring my word count for the month up to the required level. Tim's a great character for springing surprises and one of them was this album. "I picked up a few copies in Holland," he told me, gesturing to this LP (Yeah, he's also extremely unusual in being someone who owns a record outlet who actually prefers LP to CD) which I hadn't seen in years. How could I resist buying a copy?

I have a fondness for the bass guitar, especially when Pastorius is in the driving seat: his were the four strings that ducked and dived through my favourite Joni Mitchell albums. Herbie Hancock's sleeve notes on this album describe him as "a phenomenon... able to make sounds that aren't tortured a la Justified and Auckland Tammy Wynette. Sheyeeeet, thayert wuhman's voyeece jurst keeeeels me. Tori also benefits from her way of singing the same language that I speak. She's also a perceptive song-writer and possesses an enormously charming and distinctive singing voice. That voice is American but nonetheless sounds like it's singing the same language that I speak most of the time: in other words her vowels aren't tortured a la Justified and Ancient Tammy Wynette.

I was assured by the record company responsible for the Marianne Faithfull album "Blazing Away" that it wasn't being released on vinyl; not at all, never, not ever, no way. So how come I have a copy on what looks to my untrained eye remarkably like a twelve inch slab of black plastic? Tim sourced it from Germany! What a geezer!

Tori Amos
Tori Amos
Little Earthquakes
EAST WEST 7567-82358-1

So who's Tori Amos? I dunno. I can tell you that she's a damn good-looking girl who sits inside packing crates with a toy piano but, hey, that much you can work out for yourself from the album sleeve! You'll have to play the disc, however, to discover that she's also a perceptive song-writer and possesses an enormously charming and distinctive singing voice.

That voice is American but nonetheless sounds like it's singing the same language that I speak. She also benefits from her touching the Kate Bush's about her, being able to sustain and float notes, even those which rise barely above a whisper. Real toe-tappin' sensual stuff.

She also appears to have that elusive quality of being able to produce highly commercial sounding songs without sacrificing any lyrical integrity. By the time this review appears she might even be a household name. Perhaps she could then teach other Tories a thing or two about making life more fun for people!
My attitude towards old albums which are subsequently re-issued on CD tends to be rather negative. Being slightly over twenty-one years of age I enjoyed the benefit of growing up with rock music and I managed to catch most of the worthwhile record releases the first time round. Many of them have remained with me to the present day which says more about the robustness of the vinyl medium than any undue care on my part. I wasn't a precious audiophile back in the sixties and I'm not one now. I still leave naked discs on the carpet, dust them off with my shirt sleeves, and place them on the record player with a cigarette clenched between my teeth! I take a dim view when record labels repackage those albums onto CD and try to persuade me to buy them for a second time, particularly when the original albums sounded - and still are - magnificent and the re-issued silver discs don't have the same magic.

I will admit, however, that some of the discs I would like to have owned did escape me. Conversely, some which should have escaped ... why. I wonder, did I ever spend money on.

Nick Drake's music, although quite beautiful, splendid and fragile, clearly betrays his disturbed, reclusive, melancholic personality. The songs are not products of the wistful onanism of the deliberately miserable-in-my-bedst singer-songwriter clique but a poetic and musically rewarding insight into a genuinely vulnerable psyche. One of the saddest aspects is that, despite his obvious and individual talent, Drake never tasted the rewards of commercial success.

Listening to his albums I became aware of the striking similarity between his voice and that of Martin Stephenson, another musician for whose music I have a lot of respect. The longer I listened the more certain I became that Drake had influenced him strongly. If you like the latter's laconic, unforced singing style you ought to check out Drake. Elsewhere on the four discs in this set you'll discover some familiar names amongst the credits and you'll find some good playing throughout from the likes of Richard Thompson, Danny Thompson, Dave Mattacks, John Cale and others.

And if you worry about the sound of CD reissues I can't tell you how these compare to the original releases because I don't have them. They certainly don't have the analytically retentive, pristine, clinical sheen of a Steely Dan CD but they sound close enough to real human beings playing real instruments which is far more important if you're into the music and not the presentation. Once you're taken by Drake's performances you won't give a flying one about the master tape hiss.
**ANDY SHEPPARD**

**In Co-Motion**

**ANTILLES 510344-2**

"It was inevitable Andy Sheppard would make an album like In Co-Motion" announce the liner notes on this, Sheppard's fourth outing for Antilles. Well, that's probably true, but whether that's a good thing or not isn't entirely clear to this reviewer.

Sheppard emerged in the mid 80s as part of the much-talked-about British jazz revival, and since then has often played second fiddle, in the media at least, to his labelmate Courtney Pine. Where many of the young "Brit jazzers" were content to recycle American hard-bop in much the same way that the Marsalis clan had in the States (and no-one was more guilty of this than Pine), from the outset Sheppard had broader horizons. His debut album toyed with numerous live and recorded dates with Sheppard in the past. No, ultimately the problem lies with the charts which simply don't push the musicians enough. Jazz-rock has already had a bad name among jazz snobs, undeservedly so when one considers that Lifetime, the Mahavishnu Orchestra, Last Exit and Material all sit in there somewhere, but this record surely does not help its case.

If you're already into Sheppard, then you'll need this to see what his playing is up to. There are no worries on that score: Sheppard, with his vast vocabulary of everything from piercing harmonic squalls to wonderfully sweet phrasing, continues to prove himself one of the first truly unique British jazz voices to emerge since Evan Parker. The uninitiated should check out Introductions and Soft first.

The outer limits, to be sure. God are a London-based collective of musicians led by saxophonist/vocalist Kevin Martin, whose music may not sound a whole lot like jazz to most listeners. The line-up nonetheless boasts some members well known in the field, notably Henry Cow's Tim Hodgkinson and Eddie Prevost of the legendary improvisatory group AMM, and who tap into a rich vein of jazz influence: 70s period Miles Davis ("Dark Magus", "Agharta", "Pangaea" and so on); the 60s "New Thing" in particular, to these ears at any rate, Albert Ayler); the electric bands of Ornette Coleman and his successors (Prime Time, the Decoding Society, Material, Last Exit); and the noisier end of the European free jazz scene. (Peter Brotzmann must be a god to God, if you see what I mean.)

Of course, there's a lot of other stuff in there; early PIL, the On-U-Sound set, hardcore and a whole bunch else, and the titles alone ("Sick Puppy", "I'll See You In Hell") would probably put off your average Wynton Marsalis fan. But no less a jazz figure than the alto saxist-composer-collagist John Zorn is enough of a fan to have insisted that last year's "Outside In" jazz festival put them on the bill.

Loco is actually the group's debut release, a live album that really only gives a glimpse of things to come for them. Rumour has it that they've signed a deal with a major label and are already at work on their debut studio release. It's for only the most adventurous of jazz listeners, but for those who are concerned with where the music is going, God are a useful barometer.

**GOD**

**Loco**

**PERMIS DE COSTRUIRE**

**PPP106/PATH 09**

(Prime Time, the Decoding Society, Material; and the noisier end of the European free jazz scene. (Peter Brotzmann must be a god to God, if you see what I mean.)

When Miles Davis died last year, no-one could say with any real degree of honesty that a huge hole had been left in contemporary music. Although the trumpeter had been working throughout the 80s, and often with alarming levels of creativity for a man of his age and state of health, it's probably fair to say that, had he lived another twenty years, music wouldn't be significantly enhanced. Had he died twenty-odd years earlier, however, pretty much all creative music from then on would sound unrecognisable. For between 1968 and the late 70s, Davis recorded a series of albums which so seamlessly reconciled apparently disparate musical styles - from the blues to serialism, free-form jazz to funk - that the cross-fertilisation enriched everything that followed. 1968's Filles De Kilimanjaro, at
long last released on CD in the wake of its creator's death, presaged this legacy, coming as it did between the virtuosic, acoustic mid-period "Miles Smiles" and "Nefertiti" and the electric maelstrom that began with "In a Silent Way". A small group of Davis, Wayne Shorter on tenor, Tony Williams on drums, Herbie Hancock or Chick Corea on electric piano and Ron Carter or Dave Holland on bass, work their way through a set of Davis originals that balance the explosive freedom of jazz soloing and the basic inner shriek of the blues in a way that has seldom been recaptured.

And then there's the sheer sound of this band: the warmth of the Fender Rhodes piano, relatively unused in jazz even as late as '68, the searching, restless tenor solos of Wayne Shorter (who went on to find fame in Weather Report alongside another Davis alumnus, Joe Zawinul), the James Brown basslines (often played in unison with the electric piano). Above it all, Davis's brooding malevolent trumpet, all the while seeking the sound that a somewhat younger man, Jimi Hendrix, was eliciting from a much younger instrument, the electric guitar.

Twenty-odd years on this remains an astonishing record, alone in Davis' oeuvre and for that matter, in the entire canon of jazz since; and for that alone, it's surely worth acquiring.

JOHN COLTRANE/ARCHIE SHEPP
New Thing at Newport
GR/IMPULSE GRD-105

Finally re-issued on CD. 1965's "New Thing at Newport" isn't what it might initially seem, a collaboration between the tenor saxophone giants Coltrane and Shepp (although that's a mouth-watering prospect), but a record of two separate sets by the saxists' quartets given on the same evening of July 2nd, 1965, at the Newport Jazz Festival. Which probably gives the impression that what we have here is a slice of history, a document, a mere snapshot of a moment in time. History.

Well, it is, but it is a whole lot more besides. The album opens up with Coltrane's two-song set, almost thirty minutes of music that showcases one of those groups which is, like the Hendrix Experience, or Bill Evans with Scott La Faro and Paul Motian (two fairly different groups, admittedly), somehow, almost mystically, just right. Coltrane is on tenor, McCoy Tyner on piano, Jimmy Garrison on bass, and the explosive Elvin Jones on drums. The group was to implode in just a few months but the energy contained in this set alone outshines much of the music of the years since. On the second song in particular: the Coltrane perennial "My favourite Things", the interplay between the musicians is staggering; the beat remains, and forcefully at that, but in and out weaves each voice, individual but utterly essential to the whole. Definitive ensemble jazz.

Archie Shepp's set is a very different barrel of worms. Where the Coltrane quartet home in on the details of a single theme, a Rodgers and Hammerstein standard, say, Shepp's delight in the dramatic contrasting of genres - frantic and abstract group improvising, a sleazy blues, a poem recited over a vibes and bass ostinato - and work through their ideas with astonishing speed. They play five songs in just over the time it takes Coltrane to get through a couple. At the time both critics and audiences were baffled by Shepp's eclecticism and apparent restlessness (although few ever doubted his evident technique as a saxophonist), but a quarter of a century on and with post-modernism woven firmly into all of our thinking, Shepp in many ways sounds more contemporary than Coltrane.

A history lesson, then, but an undeniably enjoyable one.

TRILOK GURTU
Living Magic
CMP RECORDS CMP CD 58

And finally... Trilok Gurtu is a master Indian percussionist whose association with jazz goes back to his days in Shakti, John McLaughlin's post Mahavishnu Orchestra acoustic Indian/jazz fusion ensemble and has continued the association ever since. "Living Magic" is his second outing for CMP and features a couple of jazz notables - Brazilian percussionist Nana Vasconcelos and tenor and soprano saxophonist Jan Garbarek. The album's an odd mix of fairly standard fusion tunes which wouldn't sound out of place on, say, a Steps Ahead album, all underpinned by Gurtu's frenetic drumming. Not an essential album (and one not helped by an idiosyncratic production which has instruments moving around in the mix to an irritating degree) but worth it for Garbarek alone whose splendidly titled "Once I wished a tree upside down" is the standout track here.

Simon Hopkins
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BELA BARTOK
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Visions Fugitives
Op52 (arranged Rudolf Barshai)
PYOTR TCHAIKOVSKY
Souvenir d’un Lieu Cher
Op42 (arranged Alexandru Lascae)

Vera Beths, violin*, Arion Ensemble;
this, the Arion Ensemble’s second
very beginning. The rapport established
Op22 (arranged Rudolf Barshai)
Visions Fugitives
BELA BARTOK

orchestra was founded in 1969, and
Romanian-born Alexandru Lascae has
• i  his
PARTRIDGE 1 I 26-2 (DDD/60.46)

masterpiece of Bartok’s later years; a
recording for the Dutch Partridge label.

first-rate transcription of one of

And, while the special character brought to the Visions by the
piano original could not be displaced.

Bartok’s transcription loses nothing of
their incisiveness.

Bartok’s Divertimento, composed in
August 1939 to a commission from that
towering champion of contemporary
music, Paul Sacher, is a wholly acces-
sible, richly melodic, yet technically
highly-demanding work whose light,
folk-like, often frolicsome outer
movements are in sharp relief to the
anguished foreboding of the second
movement. Given the date of the
composition, there is little doubt that
this movement reflects Bartok’s mood at
the time, with his native Hungary poised
to become part of the Nazi empire.

Given the appeal and originality of
the programme and the qualities of the
playing (Vera Beths is a very fine soloist
in the Tchaikovsky) and recording, this
Partridge issue merits attention.

ANTONIN DVORAK
Ten Legends
Op59/From the Bohemian Woods
Op68/Polonaise in E flat Major.
DUO CROMMELYNCK, piano.

• When, in 1881, Dvorak completed
his Op59, the Ten Legends for piano
two hands, he dedicated them to the
prominent music critic, Eduard Hanslick.
It would appear that Hanslick was
genuinely impressed by Dvorak’s
offering, writing: “Each person may have
his own particular favourite among the
Legends, but there is one point in which
certainly everyone is in agreement: they
are all beautiful.” And listening to these
musical pictures, so richly characterful
and imaginative, so replete with
variations of tempo and mood, it is
difficult to disagree.

Three years later, buoyed by the
success of both the Legends and the
Slavonic Dances (also originally written
for piano four hands), Dvorak’s
publisher, Simrock, urged him to write
another work in the same vein. The
result was another set of what Dvorak
called “character pieces”, From the Bo-
hemian Woods. The six pieces begin
with a subject which also captivated
Mendelssohn, the spinning wheel. His
Spinning Song is among the most
famous of the Songs Without Words.
Dvorak’s In the Spinning Room stems
from the same poetic root, as does the
second of the Bohemian ‘pictures’, On
the Black Sea. The atmosphere of
mystery and sorcery is perfectly evoked
in Walpurgis Night, while in On Watch,
the measured tread of the hunter is
embellished with delicate imitations of
birdsong. From Stormy Times is perhaps
the most demanding piece in a set
which asks much of the players in terms
of both virtuosity and poetry. The
appeal of the fifth piece, Forest Calm,
was overblown when it first appeared.

As, indeed, is that by the Russian
composer, Alexandru Lascae, who
still does not know why the name.

it’s an attractive programme: a
masterpiece of Bartok’s later years; a
recording for the Dutch Partridge label.

For the 80th anniversary of the
Partridge label, the Duo Crommelynck produce
a most persuasive performance,
idiotic and colourful. After hearing

Pride of place this month
goes to the music of Dmitri
Shostakovich, including the
most famous of his fifteen
symphonies - and still one of
the most controversial.

Indeed, there is a strong
emphasis on twentieth
century music, both
European and American, but
we also mark an anniversary
just past - Mozart - and the
one now arrived, the 200th
birthday of Gioacchino
Rossini.

peter
herring

ANTON Dvorak

Legends, op. 59
From the Bohemian Woods, op. 68-
Polonaise in E flat Major.
DUO CROMMELYNCK. Piano Four Hands.
These are not one-dimensional figures, the San Moise theatre in Venice. It was an astonishingly mature debut for an eighteen-year-old, a comprehensive operatic laments composed by Rossini for the embryo Romanticism of the nineteenth century. What is also remarkable about this work is the depth of its characterization. These are not one-dimensional figures, but the products of subtle illusion, parody, irony and sharp-witted caricature. The absurdity of some of their behaviour - an idiotic duel, for example - is pointedly satirized. The opera also provides early evidence of Rossini's sophisticated dramatic skills, as well as his consummate musical technique.

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The ploy, to a libretto by Gaetano Rossi, is a familiar one: either pledges daughter to lucrative (for him) marriage contract with important: business client; she, of course, loves another; enter the go-between to mediate between the two conflicting interests. Eventually the 'client' recognizes true love when he sees it, renounces all claim on the daughter and, after an abortive attempt at a duel, persuades the father that his child is more than merchandise.

Wisdom and humanity prevail. As comic opera plots go, it isn’t all that outlandish. For this production, Claves assembled an Anglo-Italian team: a first-class set of Italian soloists, under the able direction of Marcello Viotti, and our own English Chamber Orchestra, all superbly recorded by Tony Faulkner in All Saints, Tooting. The whole recording bubbles with vitality and enthusiasm and, at a digestible length of seventy-odd minutes, seems to me an ideal way to sample the genius of Rossini. For established Rossini enthusiasts, the recording is self-recommending. One drawback there is no translation of the Italian libretto, but the precis of the plot should prove adequate.

**ROBERT KURKA**

**The Good Soldier Schweik - suite**

**PETER MENNIN**

**Cello Concerto**

**WALTER PISTON**

**Symphony No1**

Janos Starker, cello; The Louisville Orchestra; conductors, Robert Whitney, Jorge Mester.

**Robert Kurka**

Robert Kurka inspired by that pungent anti-war satire 'The Good Soldier Schweik'. Brilliantly orchestrated and full of wit and sardonic humour, the suite is very reminiscent of Prokofiev's Lieutenant Kije, which also of course sets out to satirize the stupidity, hypocrisy and self-serving of military hierarchies. The music owes something to Gershwin and, in its use of winds and percussion, to the neo-classical Stravinsky, but in most respects it is the work of an imaginative musical talent.

Kurka developed the Schweik suite into an opera which should have marked the beginning of a memorable career. Sadly, Kurka died the year he completed the work - 1957 - at the age of just thirty-six. The previous year had seen him, as professor of music at the University of Illinois, acknowledged for his richly romantic Cello Concerto, Leonard Rose taking the solo part. This fine work, here beautifully played by Janos Starker, explores the 'singing', poetic nature of the cello to the full and is unashamedly virtuosic. Like the other works here, it rewards exploration. The recordings, which date from 1969 and 1978 and have been expertly remixed by Andrew Kazdin, are wholly acceptable.

**WOLFGANG AMADEUS MOZART**

**Violin Concerto No1 in B flat Major K207/Violin Concerto No3 in G Major K216/Violin Concerto No7 in D Major K271 a**

Scottish Chamber Orchestra; soloist/director, Ernst Kovacic.

**IMP CLASSICS PCD946 (DDD/67.03)**

**Mozart** completed his five 'authenticated' violin concertos in the space of one year, 1775, during his, ultimately unhappy, tenure with the Archbishop of Salzburg. As so often, they were written with one player in mind, in this case Antonio Brunetti, soloist and first violin of the Salzburg court orchestra. Mozart does not seem to have regarded Brunets as being more than a proficient musician, which may explain why these concertos concentrate on the singing, expressive qualities of the instrument rather than technical display.

If not Mozart at his most profound, the Violin Concertos - especially the Fourth and Fifth - have riches of beauty, melody, charm and elegance which elevate them above the level of purely

**GIOACCHINO ROSSINI**

**La Cambiale di Matrimonio**

Bruno Pratico; Alessandra Rossi; Maurizio Comencini; Bruno di Simone; Francesco Facinì; Valeria Baiano; Maciej Rakowski, violin; Ursula Duetzschler, harpsichord; English Chamber Orchestra; conductor, Marcello Viotti.

**Claves CDS0-9101 (DDD/77.50)**

- Exit Mozart (died 1791), enter Rossini (born 1792). Another anniversary to celebrate and, if all the commemorative issues and reissues are up to the standard of this Claves production, one to relish. La Cambiale di Matrimonio (The Marriage Contract), first staged in 1810, was the first of five operatic 'farces' composed by Rossini for the San Moise theatre in Venice. It was an astonishingly mature debut for an eighteen-year-old, a comprehensive operatic laments composed by Rossini for the embryo Romanticism of the nineteenth century. What is also remarkable about this work is the depth of its characterization. These are not one-dimensional figures, but the products of subtle illusion, parody, irony and sharp-witted caricature. The absurdity of some of their behaviour - an idiotic duel, for example - is pointedly satirized. The opera also provides early evidence of Rossini's sophisticated dramatic skills, as well as his consummate musical technique.

- We in Europe are quick to accuse Americans of insularity yet, it has to be asked, beyond Copland, Bernstein, Gershwin and, to a small degree, Ives and Barber, how much attention has Europe paid to the achievements of 'serious' American music? A recording such as this could be something of an eye-opener. The British musicologist and composer Robert Simpson thought Walter Piston "America's most mature composer" and, listening to this cogent and well-crafted First Symphony it is easy to see why.

- Piston first studied art and went to work in the drawing office of a Boston railroad company. He played the violin and piano in his spare time and only took up serious musical studies after service in the First World War. His first symphony was first performed by the Boston Symphony Orchestra in 1938, when the composer was forty-four. Its taut, three-movement structure is both arresting and immediately accessible.

- Just as accessible is the lively suite by Peter Mennin - which is a showpiece for the modern cello, in this case played by Janos Starker, exploring the 'singing', poetic nature of the cello to the full and is unashamedly virtuosic. Like the other works here, it rewards exploration. The recordings, which date from 1969 and 1978 and have been expertly remixed by Andrew Kazdin, are wholly acceptable.
The very term 'Toccata' suggests virtuosity in abundance, and that is true of the eight works recorded here, but in each case that virtuosity remains the servant of a quest for deeper expression and it is that which makes Frescobaldi's music so involving and rewarding. Each Toccata resembles an intimate, revealing discourse, seemingly free of structural constraints. But the expression is carefully nurtured in the spread chords, the thoughtful selection of registers and dynamics, the articulation and phrasing, and the subtle use of ornamentation. Essentially, it is the skilful transcription of free invention.

Frescobaldi's music has its roots in the traditions of his native Ferrara and of Mantua, but was to become a synthesis of styles from all over Italy. He assimilated these styles into his own sophisticated, cultivated and ambitious musical language with dazzling success. In this Tactus recording, Sergio Vartolo plays a copy by Barthelemy Formentelli of an Italian harpsichord in the collection of the Ca'Rezzonico Conservatory in Venice and it is difficult to conceive of a more persuasive introduction to Frescobaldi's music. As with all the Tactus issues I have encountered, the sound is first class, the product, it would seem from the sleeve note, of just a Sony PCM1610 and a single Neumann SM69fet microphone: whatever the technique, it works beautifully.

**GIROLAMO FRESCOBALDI**

**Toccatas for Harpsichord - Book One (1615-16)**

Sergio Vartolo, harpsichord.

**TACTUS TCS8060701** (DDD/57.47)

- The dry history records that Girolamo Frescobaldi was born in Ferrara in 1583 and died in Rome in 1643 and that such was his reputation as an organist, when he was appointed to St Peter's, around 30,000 people came to hear his first performance there. He was one of the founding fathers of instrumental music and, through his pupils such as Froberger, became a vital influence on the later German school of Bach and Handel.

- From that, you might assume that Frescobaldi and his music could be safely left as an entry in the musical dictionary. But that would be to overlook some of the most eloquent instrumental music of the Italian Renaissance, for Frescobaldi is one of the first composers for whom the keyboard became significantly more than merely a vehicle for virtuoso display.

- The wealth of Weill's music can be appreciated here, the sweetness and the satire. It is well-performed throughout and vividly recorded and is the kind of recording that should ensure Kurt Weill's true place in the pantheon of twentieth century music (given that there are still tomes being published which entirely overlook his contribution).
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On January 28, 1936, the official Communist Party newspaper Pravda launched an attack on Shostakovich's opera 'Lady Macbeth of Mtsensk'. For the thirty-year-old composer who, up until then, had largely enjoyed the support of the Soviet authorities, it was a bolt from the blue. Suddenly, he was responsible for 'muddle instead of music'; he had let past compliments go to his head. Such terms as 'leftist', 'formalist', 'cacophonous' and 'musical chaos' were applied. The plot of the opera, according to Pravda, was vulgar, decadent and tasteless. Yet this had come two years after the work's first performance, two years during which the opera had become a success throughout the Soviet Union, Europe and in the United States, all with the apparent encouragement of Stalin's apparatchiks. Clearly, there had been a change of policy and Shostakovich was its hapless victim. It was not to be the last time he would suffer in such a way.

Shostakovich had tried to serve two masters: his art and the state. The results had not fallen short of his own expectations nor, he believed, the state's. But, by 1936, the composer's ideal of realism, as so effectively articulated in 'Lady Macbeth' was no longer synchronized with Soviet realism. The role of the artist was no longer to experiment and to stimulate ideas. In a country feeling increasingly threatened and isolated it was to spread solidarity and confidence, to espouse patriotism and heroism. Prokofiev's cantata 'Alexander Nevsky' of 1938 fitted the ideal exactly (it is worth recalling that Prokofiev openly stated that he wrote two types of music: one for the masses and one for posterity).

Shostakovich remained silent during his 'purge'. He must have been bewildered by it all since he was in no way attempting to undermine the Soviet state; quite the opposite. Prudence dictated that, to avoid further controversy (and possibly worse), he withdrew the brooding, complex Fourth Symphony and began work on something that, while acknowledging his critics, would not compromise his own ideals. The result was the Fifth Symphony, the controversial 'Soviet Artist's Practical Creative Reply To Just Criticism'. The Soviet authorities took this subtilite at face value, and the errant composer had seen the error of his ways. The more perceptive, though, saw that Shostakovich had acknowledged the criticism that he himself thought 'just', based on musical judgement not ideological tenets. Whatever they may have thought, the apparatchiks had not changed Shostakovich, he had matured.

The Fifth Symphony was premiered in Leningrad (now St Petersburg) under the baton of Yevgeni Mravinsky on November 21, 1937. It was an immediate success and redeemed Shostakovich in the eyes of the Party. It earned him a status he would never relinquish, even during Stalin's later purges, such as the attacks of 1948. It also probably demonstrated to him that, like Prokofiev, he would have to be prepared to exist in a kind of musical schizophrenia. On the one hand, a tool of the state; on the other, a composer whose integrity remained intact and who could largely express his innermost feelings and ideas through the intimate medium of chamber music, especially the string quartet. That he performed this balancing act for so long and so successfully is a tribute both to his genius and his resilience.

DMITRI SHOSTAKOVICH
Symphony No 5 in D minor Op47
Leningrad Symphony Orchestra; conductor, Alexander Dmitriev.
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★ Attitudes to the Fifth Symphony have changed somewhat in the past decade, largely prompted by Solomon Volkov's much-disputed 'conversations' with Shostakovich published in his book Testimony. It was originally seen as an heroic symphony on heroic themes: the composer himself talked of the theme being "the making of man". The finale, he said, was "the optimistic solution of the tragically tense moments of the first movement." Tragedy there certainly is, both in the first movement and the profoundly intense Largo. But, if we are to believe Volkov, the 'triumph' of the last movement is a deliberate sham, full of hollow rhetoric that would be credible only to the cultural thugs it was meant to convince. Anyone of sensitivity would see through the superficial bluster to the emptiness within.

In which case, this interpretation of the Fifth, recorded live in the City Halls, Glasgow, in April 1990, may well be the version for the 'nineties, reflecting a period when an entire ideology has been exposed as a sham. Dmitriev accentuates the bombast of the finale, points up the sardonic humour of the scherzo, the fake charm of the violin solo, but then – rightly – brings out the intensity and heartfelt sincerity of the Largo, with all the personal and universal sadness it seems to contain.

But perhaps the finest trait of this performance, along with the playing of the Leningrad orchestra (recently renamed, of course), is its cohesive-ness and its sense of direction. In the opening movement, where he is faster than any other version in my collection, Dmitriev initially appears lightweight in comparison to Previn, Bernstein or Haitink. Yet, essentially, the approach is justified: it is in character with the rest of the interpretation which sees the Largo as the heart of the work and the key to its ambiva-lent, ambiguous nature. It is a challeng-
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MANA ACOUSTICS ........................................... 94
MERIDIAN .................................................. 46
MICHAELSON AUDIO ................................... 50
MISSION ................................................... BC
MUSICAL FIDELITY ...................................... 44
MUSICAL IMAGES ........................................ 72
NAD ........................................................... 32
NAIM AUDIO .............................................. IFC
PENTAX .................................................... 42/43
PM COMPONENTS ....................................... 92
QUADATTANNOY ................................... 78
STANDEN ................................................... 94
TECHNICS ............................................... 14/35
THHE VIDEO SHOW .................................. 106
VINYL TUBE AUDIO .................................. 70
WHARFEDALE ............................................ 14
WILMSLOW AUDIO ................................... 80

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</thead>
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