

NEWS AND TECHNOLOGY ■ INSTALLATION ■ SERVICE ■ DEVELOPMENT

TELEVISION

AND CONSUMER ELECTRONICS

MAY 2004 £3.20

TV/video Spares guide 2004



**Servicing
Toshiba
projection TVs**

**Digital Radio
Mondiale**

**Why DC was
abandoned**



FAULT FINDING FOR TV ■ AUDIO ■ SATELLITE ■ VIDEO ■ IT



The universal remote that finally makes life simple...

Instruction manuals that don't quite make sense, codes that seem oh' so similar and easy to get wrong. And when you do make a mistake, you have to start from the beginning! And more buttons than you can throw a stick at. Great if you've got time, patience and a degree in mathematical engineering, a pain if you don't want to miss your favourite soap! Isn't it about time someone developed a range of universal remote controls that were simple to set up and simple to use...

That's exactly what we've done. The result, the Classic 'Smart Universal', a new line in universal remote controls that operate all the popular television, satellite, video, DVD and text systems currently available. Three styles to choose from depending on your needs with one set of simple, clear instructions. Learn one, you've learnt them all.

Stylish designs, robust, reliable construction, cost effective and AVAILABLE FROM YOUR LOCAL DISTRIBUTOR. Contact TW Electronics on 01635 278678 for a list of Classic stockists.

classic

Technical helpline 01635 278678

CONTENTS

May 2004

Vol. 54, No. 7



387 Comment

The wonderful world of patents. TV's malign influence. All those brands.

388 News

New type of DVD disc. Video news. Top-Up TV launch. New DVD-S standard. DVD news.

390 Letters

Price of spares. Bangs in the night. Digital carping. Aerial mysteries. Picture quality. A Grundig modification.

391 Help wanted

392 What a life!

Donald Bullock comments on letters and emails he's received in recent weeks.

394 Days of DC

We nowadays never have to think about the mains supply: just plug in and go. It was not so in the period up to the early Sixties however, when AC was distributed at several voltages and there were still quite a lot of areas that had a DC supply. Keith Cummins recalls the days of DC mains supplies, and explains why they were eventually abandoned.

396 Digital Radio Mondiale

Last year saw the launch of Digital Radio Mondiale, a new digital radio system for use in the long-, medium- and short-wave bands. The DRM consortium was formed in 1998, and in 2001 the ITU recommended the system for worldwide use. J. LeJeune describes the technology and lists current transmissions.

398 Books to buy

The Television book service, with details of some of the titles you can order.

400 Repair notes on Toshiba projection TVs

John Coombes provides fault-finding guidance on sets fitted with the C5SS, C8SS and C00P projection chassis.

409 Monitor faults

410 Digital audio image restoration

K. Rutherford describes a recently-developed technology that enables the optical sound tracks on films from the Golden Age to be preserved.

413 Spares Guide 2004

The annual updated Television TV/video spares guide, a listing of sources of spares for TV, video and audio products. Essential reference information.

418 DX and Satellite Reception

Terrestrial DX and satellite TV reception reports. Digital, broadcast and satellite TV news. DXing past, present and future. DAB reception in Canada. Roger Bunney reports.

421 Book review

The Digital Television Viewer's Guide 2004.

422 Audio faults

423 Test Case 497

424 DVD and home cinema fault reports

426 VCR clinic

428 TV fault finding

432 Extended fault reports

Reports on tricky or complex TV fault conditions.

434 Satellite notebook

Hellas at 39°E. Digital channel update. Recording MPEG-2 signals on a DVD. Atlantic Bird 2. Digibox fault report.

438 Web service

Useful websites for TV professionals, technicians and enthusiasts.

440 Service casebook

Michael Maurice on problems he's encountered in the field and the workshop.

443 Next month in Television

Editor

John A. Reddihough
TVeditor@highburybiz.com

Deputy Editor

Tessa Winford

Production Editor

Jane Massey

Production Executive

Dean Turner
01322 611206
d.turner@highburybiz.com

Advertisement Sales

Luke Baldock
01322 611 289
Fax 01322 616 376

Editorial Assistant

Caroline Fisher
01322 611 274

Managing Editor

Bill Evett

Publishing Director

Tony Greville

Note that we are unable to answer technical queries over the telephone and cannot provide information on spares other than that given in our Spares Guide.

Disclaimer

We work hard to ensure that the information presented in *Television* is accurate. However, *Television's* publisher - Highbury Business - will not take responsibility for any injury or loss of earnings that may result from applying information presented in the magazine. It is your responsibility to familiarise yourself with the laws relating to dealing with your customers and suppliers, and with safety practices relating to working with electrical/electronic circuitry - particularly as regards electric shock, fire hazards and explosions.

**Next issue, dated
June, on sale May 19**

Profilo Telra

Brand New PT92

**Complete Working PCB's
(Widescreen Version)**

As used in the following makes of TV
Bush, Fidelity, Wharfedale, Akura, JMB,
Naiko & Watson

BUY ONE GET ONE FREE

Buy one carton of Perfect PCB's and
get one carton of damaged PCB's FREE
for spares

Only £90 per carton + VAT

Carton content 9 panels

Next day Carriage £9.95

Most major credit cards accepted

Showroom ready B-grade stock
also available

For more information contact
Contact Ian Botterill

Key Electronics Ltd
01388 819525

Comment

The wonderful world of patents

There are few matters that cause more litigation than patent law. As I understand it, you can't take out a patent for a particular 'thing': it has to be for something produced in a specific way for a particular purpose. For example you couldn't take out a patent for steam, but you could for the generation of steam in a specific way for a specific purpose. This makes the matter of filing a patent rather complicated, which is why so many lawyers are required to try to make patents watertight.

The importance of patents is of course fundamental to modern industry. Companies would not invest millions of pounds, dollars or whatever in research and development if they couldn't protect the results from copying by all and sundry. It's a complex matter, and companies that invest heavily need large departments to produce careful patent applications and keep an eye on each other's applications as well as possible abuses. Many companies file thousands of patents a year, so it's a pretty big industry in itself. Cross-patenting is common practice in technology-driven industries, to enable products of a high standard to be made available to the public with the minimum of legal fuss.

But every so often things seem to go wrong. The latest example is the spat between Kodak and Sony over patents for digital cameras. Kodak seems to have taken the initiative, by filing a lawsuit against Sony for allegedly violating ten core digital camera patents. Kodak has more than 1,000 worldwide patents relating to digital photography. The two companies had been involved in licensing negotiations for some three years. Now Sony has filed a lawsuit against Kodak, claiming infringement of ten of its own patents.

It's probably all good, lucrative fun for the lawyers, though it must be difficult to decide exactly what is covered by a patent when high technology is involved. We'll no doubt have to live with this sort of thing for years to come.

TV's malign influence

Last month I commented on the malign influence of TV, based on some work carried out by Professor Richard Layard of the London School of Economics, due to be published later this year. That related to the UK. Similar work has been done, and conclusions reached, in the US. A recent

book by Godfrey Hodgson of Princeton University has as its theme how the US has changed for the worse over the last quarter of a century. Various important factors are quoted to explain this depressing state of affairs, but TV is described as being the single most pernicious one – in its effect on politics and culture.

Godfrey Hodgson cites research carried out by Harvard political scientist Robert Putnam, who found a decline in all US social, political and religious institutions, leading to a comprehensive civic disengagement by the public. By 1980 TV viewing in the US averaged seven hours a day per household. Its low quality and advertisement dependence propagates consumerism and a lack of questioning by viewers. Particularly insidious, it's suggested, is the interlinking of news and entertainment to produce "infotainment". Apparently in the US news coverage is all too selective and analysis scanty, which leads to a general ignorance of what's going on in the world.

UK TV, with its greater dependence on public-service broadcasting, should in theory avoid the worst of this. But we can't be complacent. TV standards need to

be monitored and maintained. You can do this in many countries, but across much of the globe it's probably impossible. TV can be abused as much as any other medium, but the consequences are likely to be more devastating.

All those brands

We've done a bit of pruning with this year's TV/video spares guide, deleting a number of older brands for which specific spares are probably no longer available. Suppliers of spare parts obviously can't clutter their warehouses with items for which there is minimal or virtually no demand. But I feel that we could do better with information on many more recent brands. The trouble is that they are not sold by traditional radio/TV traders: they are brands that are created by the buyers for supermarkets and various chains, and it's not easy to get to grips with the way in which this side of our business is organised. Some readers may have information on who sells these newer brands (Naiko for example) and the spares situation. If you have any information of this sort, it would be very welcome to us.

COPYRIGHT

© Highbury Business, 2004. All rights reserved. No part of this publication may be reproduced, stored or transmitted in any form or by any means without the written permission of the publishers.

All reasonable precautions are taken by *Television* to ensure that the advice and data published are reliable. We cannot however guarantee it and we cannot accept legal responsibility for it.

CORRESPONDENCE

All correspondence regarding advertisements should be addressed to the Advertisement Manager, *Television*, Highbury Business, Media House, Azalea Drive, Swanley, Kent, BR8 8HU. Editorial correspondence should be addressed to *Television*, Editorial Department, Highbury Business, Media House, Azalea Drive, Swanley, Kent, BR8 8HU.

INDEXES AND BINDERS

Indexes for Vols. 38 to 53 are available at £3.50 each from SoftCopy Ltd., who can also supply an fifteen-year consolidated index on computer disc. For further details see page 443.

Binders that hold twelve issues of *Television* are available for £6.50 each from Modern Bookbinders, Pringle Street, Blackburn, BB1 1SA. Telephone: 01254 59 371. Make cheques payable to "Television Binders".

Newstrade Enquires

Distributed by COMAG

Telephone: 01895 444055

ISSN 0032-647X

SUBSCRIPTIONS

Highbury Fulfilment Services, Link House, 8 Bartholomew's Walk, Ely, Cambridge CB7 4ZD. Telephone 01353 654 431 Fax 01353 654 400 Email hbc.subs@highbury-wyvern.co.uk Please notify change of address.

Subscription rates:

UK 1 year £33.80, 2 years £54.00, 3 years £71.00.
Republic of Ireland 1 year £38.95, 2 years £62.00, 3 years £81.85.
Mainland Europe 1 year £49.00, 2 years £78.40, 3 years £102.90.
Rest of World 1 year £63.50, 2 years £101.00, 3 years £133.00.
Cheques should be made payable to *Television*.

BACK NUMBERS

If available issues are £4.00 each.



**HIGHBURY
BUSINESS**

A HIGHBURY HOUSE COMMUNICATIONS PLC COMPANY

NEWS

New type of DVD disc

Philips and the Japanese company MKM (Mitsubishi Kagaku Media)/Verbatim have developed a version of the DVD+R recordable disc with almost double the storage capacity of the standard version, while remaining compatible with existing DVD Video players and DVD-ROM drives. The new technology is known as DVD-DL (double layer). It gives an increase in storage capacity from 4.7GB to 8.5GB. As a result it will now be possible to record up to four hours of DVD-quality video or sixteen hours of VHS-quality video without having to turn over the disc. PC users will be able to archive up to 8.5GB of computer files on a single disc, almost doubling the capacity in comparison with the 4.7GB for the currently available single-layer DVD+R discs.

The dual-layer DVD+R system uses two thin embedded organic dye films for data storage, separated by a spacer layer. Heat from a focused laser beam irreversibly modifies the physical and chemical structure of either layer so that the modified areas have different optical properties from those of their unmodified surroundings. This causes a variation in reflectivity as the disc rotates, providing a read-out signal as with commercially-pressed read-only discs. The new dual-layer DVD+R technology has been fully endorsed by the DVD+RW Alliance.

Compatibility with existing DVD-ROM drives has been made possible by using a thin silver-alloy as the reflector material in the upper layer, giving reflectivity from this layer of at least 18 per cent, which is in

compliance with the dual-layer DVD-ROM standard. The transmission of the upper layer is greater than 50 per cent, to provide recording in and read-out from the lower layer. This layer has high power sensitivity, as the upper layer absorbs and reflects part of the incoming laser light. It also has a much higher reflectivity (greater than 50 per cent) which, after double transmission through the upper layer, again results in an apparent reflectivity, at the disc surface, of at least 18 per cent.

Recorders for the PC and CE markets are expected to become available later this year. Sony has already announced two Dual-RW DVD drives that work with the new DVD+R DL standard. Model DRU-700A will be for internal use while Model DRX-700UL will be for external use.

Video

Sony demonstrated an HDV (high-definition video) camcorder at this year's CeBIT show in Hanover. The format has been developed by Sony, Canon, Sharp and JVC. It uses MPEG-2 video compression, MiniDV tape and the same tape speed and track pitch as the MiniDV format.

Philips has announced two wireless multimedia links, Models SL3001 and SL4001. They enable MP3 music files, video clips and digital images to be



transferred from a PC to a TV or audio system around the home.

Microsoft is working with a number of other companies on a system to be known as the Portable Media Center. This hand-held device is the video equivalent of Apple's iPod portable audio player. It will store video, music or digital images transferred from a Windows XP PC. A PMC with a 40GB hard drive could store up to 175 hours of video, 10,000 music files or 100,000 digital images. Microsoft says that battery operation will enable users to watch a three-hour film or listen to twelve hours of music. The first Portable Media Center is expected to be launched by Creative Labs towards the end of the year at a price of about £400.

Sony has launched a super compact MiniDV camcorder that has a true widescreen 16:9 mode. Features include a 1Megapixel image sensor, a 2.5in. LCD colour viewfinder and monitor, a precision digital zoom and playback zoom, a Memory Stick DUO slot, MPEG Movie EX, DV in/out, USB connection and iLink DV out.

New DVB-S standard

A new standard for digital satellite broadcasting, DVB-S2, is due to be ratified shortly. It's intended for new services, primarily HDTV. Existing services can be enhanced or more channels included within a given bandwidth. The basis of the new standard is adaptive coding and modulation (ACM), which enables the transmission parameters to be changed to meet requirements. The modulation (QPSK, 8PSK, 16APSK or

32APSK), FEC (1/4 to 9/10) and bit-rate of each data block in the multiplex stream can all be varied. The result is more robust reception and an increase in bandwidth capacity of typically 30 per cent.

This calls for increased encoder processing power, in fact significantly higher than currently-available components can provide. Suitable chipsets are not expected to be available for a year or so.

Top-Up TV launch

The launch of Top-Up TV, on March 31, seems to have caused problems with some Freeview set-top boxes that have limited channel-storage facilities. As a result, some viewers lost channels they previously had. Software is being downloaded to accommodate extra channels.

Top-Up TV is apparently being transmitted using 64QAM, which provides less coverage and lower reliability than the 16QAM now used by most DTT services.

Freeview set-top boxes with a conditional-access module, also modules for IDTV sets, are due for release in June, when dealers will be able to sell Top-Up TV subscriptions. An adult channel, TVX, is to be added for an extra £9.99 a month.

Corrections

There were some component errors in the Flexible CCTV Security System article in the November and December 2003 issues, as follows:

The value (not listed) of R5 in the stepper unit is 2.2kΩ.

The value (not listed) of R11 in the proximity unit is 10kΩ.

C4, shown in the stepper unit circuit diagram, is not required. The decoupling is provided elsewhere.

The captions to the two Sony items illustrated in our CES report last month were transposed.

We apologise for these errors.

DVD latest

Sonopress, Panasonic, Digital Media Production (DMP) and Microsoft have demonstrated the first European DVD to store HDTV content. The disc uses Microsoft's Windows Media Video HD format, a compression system that enables HD material to be stored on a DVD 9 (dual layer) disc in DVD-ROM form. Sony, Universal, BMG, EMI and Warner are testing fifteen titles. The new discs are slightly thicker than standard CD and DVD discs, at 1.5mm compared to 1.2mm. This is just within the tolerances set by the CD and DVD standards, but there is concern that it could lead to playability problems. The discs, known as DualDisc, are not recognised by Philips, which set the CD standard with Sony, or by the DVD Forum.

Hitachi has launched fourth-generation DVD camcorders, Models DZ-MV550E and DZ-MV580E. Both have a quick-menu function for easy setting up and operation, and a high-speed USB 2.0 port that can transfer data to and from a PC at up to four times faster than an IEEE 1394/Firewire connection.

ARCAM has launched the DiVA Model DV79, a DVD player with an HDMI (high-definition multimedia interface) digital output socket for use with the latest plasma screens and projectors and interlaced or progressive analogue video outputs (NTSC or PAL) for standard displays. Other features include Dolby D, DTS, Dolby Pro Logic II and DVD Audio decoding, a two-way RS232 control port and adjustable lip-sync delays for PAL/NTSC. There are RGB

scart and component-video outputs. A zoom function has 1:25 and 1:5 settings to enable images with different aspect ratios to fill a 'wrong aspect-ratio' screen. The player can handle DVD Audio, DVD Video, CD, SACD, VCD, SVCD, DVD-R, DVD-RW, DVD+R and DVD+RW discs plus MP3, WMA, Photo CD and JPEG files. Price is about £1,000.

The Philips Model HDRW-720 is a DVD recorder with an 80GB hard drive that can store up to 130 hours of video.

The Panasonic DVD recorder Model DMR-E85H also includes an 80GB hard drive. Up to 142 hours of material can be stored on the hard disk and up to sixteen hours on a DVD-RAM disc. The relief recording feature automatically transfers recording to the hard disk should the DVD disc run out of space. If you forget to insert a disc, the relief recording system uses the hard disk instead. The auto renewal recording function automatically records a programme on the hard disk every day or every week. Archiving can be done with one-touch button control at x24 speed for a DVD-RAM disc and x32 speed for a DVD-R disc. For example a one-hour programme can be recorded on a DVD-RAM disc in 2.5 minutes or on a DVD-R disc in two minutes. It's also possible to record from a DVD-RAM disc to the hard disk. There's a progressive-scan output. The price is expected to be about £600.

The recently announced Cirrus Logic CS98300 DVD processor chip will add extra features to DVD recorders, including use with an integrated hard drive, transfer of content from the hard drive to DVD discs, and playback of MPEG-4 and DivX video.

Cirrus's next-generation software further simplifies DVD recorder use. The aim is reduced cost and extra features such as, with the CS92688 MPEG codec, PVR functionality. The latter includes pause, rewind and fast-forward when recording live TV on an optical disc or hard drive.



Sharp is to introduce a new range up-market, high-definition (1,080-line horizontal resolution) LCD TV sets this summer under the name Aquos Titanium, with screen sizes 32, 37 and 45in., including widescreen variants. A DTT tuner will be incorporated as standard, and the audio side will feature 1-bit amplifier technology with aluminium-housed loudspeakers. Features will include progressive scanning and DVI input. A separate AV box will incorporate the analogue and digital tuners and a PC card for displaying images from a digital camera. Prices are expected to range up to £7,500 for the largest-screen model.

Philips fluid-filled lenses

Philips has developed a fluid-filled lens that operates on the same principle as the human eye, changing shape to vary the focal length. It consists of a tube, 3mm in diameter and 2.2mm long, with transparent end caps. There are two liquids that don't mix inside, one water-based and the other an oil. The inside of the tube and one end cap are coated with a water-repellent substance. As a result the water-based liquid is forced to the other end of the tube, where it forms a hemispherical, lens-like mass.

When an electric field is applied to the coating it becomes less water-repellent, allowing the water-based liquid to wet the inside surface of the tube. As a result it becomes less convex. Adjustment of the electric field gives any liquid-lens shape from convex to concave. According to Philips switching over the entire focal range from 5cm to infinity takes only ten thousandths of a second. Little power is drawn, and the device is suitable for mass production.



Toshiba's 0.85in. hard-disk drive has been certified by Guinness World Records as the smallest in the world. It will be featured in the 2005 edition of the Guinness Yearbook, on sale next September. The 0.85in. HDD, which was announced in January, has a storage capacity of 2-4GB. Mass production is expected to start this autumn. It will enable more efficient products such as mobile phones, digital camcorders and portable storage devices to be manufactured.

Interactive TV deal

Two Way TV has signed a contract to provide mobile phone content as an interactive service with ITV1 and ITV2 via Sky Satellite. Viewers will be able to browse and buy from the content via their red button while watching a channel. Content will include video clips, ring tones, logos, wallpaper and Java games. It will also be available via ITV's interactive services menu.

The content will be related to specific programming and tailored to audiences. The first service to be launched will be based around ITV football programming: fans will be able to obtain terrace tunes, pictures of players and video clips of classic football moments, also football-related Java games. A generic pop service will provide chart-single ring-tones, celebrity logos and Java games. A series of new interactive mobile services will be launched throughout the year.

LETTERS

Send letters to "Television", Highbury Business, Media House, Azalea Drive, Swanley, Kent, BR8 8HU or e-mail t.winford@highburybiz.com using subject heading 'Television Letters'.



Please send plain text messages. Do NOT send attachments. Be sure to type your full name, address, postcode, telephone and e-mail address (if any). Your address and telephone number will not be published but your e-mail address will unless you state otherwise. Please send ONLY text intended for the letters page. Correspondence relating to subscriptions and other matters must be sent to the office address given above.

Price of spares

Component suppliers will have to get real about the prices they charge for spare parts. Is it just me or has Samsung, which used to be quite reasonable for spare parts prices, totally gone OTT with its prices for line output transformers and ICs, thereby writing off quite a few of its TV sets? Or is it simply a matter of sell 'em high and scrap 'em fast?

I will end this little ditty with one of my only slightly plagiarised quotes: "never in the field of television manufacture has so much rubbish been made by so few for so many".

From the last of the Mohicans still repairing or at least trying to repair every increasingly difficult or downright impossible to fix, horrendously designed so-called TV set.

Yours hopelessly,
Ray Withey,
Borland TV.

PS I still have fun selling darts, specialising in Phil Taylor, Eric Bristow and of course our own Jackie Wilson.

Bangs in the night

Here's a good one, I say, here's a good one! This 'fault' was with the set in our bedroom, a 28in. Schneider. Imagine what you would say if a customer brought you this set and told you that the symptoms were "we had no problem with it when it was in one bedroom, then we redecorated and put it in the other bedroom where we now sleep".

On the first night we were both woken up at about 2 a.m. by a loud bang. We checked everything. The TV set was off and unplugged, there were no broken windows on the car, and the dog was still asleep downstairs. Very strange. Anyway

we thought no more about it until the same thing happened the following night, this time at about 3 a.m.

I began to think I was losing it. After all I'm a 61 year old TV engineer, and you never see really old TV engineers anywhere, do you? Well, to cut a long story short, it was the TV set. In the first bedroom the radiator was away from the TV set. In the one we now use it was right behind the set, and the cabinet was doing a mini-earthquake, tectonic-plates style, when the cabinet cooled down in the early hours.

I cured it, of course – with some felt strips glued around the edge of the cabinet back. Now we get our much-needed sleep again. But can you imagine getting this set in and putting it on test to wait for the bang, especially when the customer says it happens only when the set is switched off?

Chris Plaice,
Tele-video-services,
Swansea.

Digital carping

There have been a number of comments in the magazine about the allegedly poor quality of digital terrestrial TV. Personally, having used a dual-standard Panasonic DVB television set for about three years now, I would never go back to analogue.

To say that under ideal reception conditions analogue TV gives a more detailed picture is to miss the point entirely. DVB was designed to provide a good picture under almost all reception conditions and does this admirably. Anyone, and there are plenty of them, who has to suffer phenomena such as co-channel interference, multi-path reception and diagonal line crawl because of digital EMF radiation from set-top boxes, VCRs, DVD players and other TV sets would certainly not find analogue reception better. In addition the colours are crisper and clearer with DVB, while the luminance is optimised to the response to detail of the human eye, making the whole picture seem cleaner and clearer. In short it's a

much better viewing experience.

To be fair, cheap Freeview adaptors and set-top boxes are probably not the best means of DVB reception – you get what you pay for. Some are very good while others are barely acceptable. In my experience a good-quality DVB television set will always provide a better picture.

So please, you Luddites out there, quieten down and let's get together and help advise everyone on how to make the best of the DVB system. In a few short years it will be all we have left.

Gerald Gutteridge,
Blaby, Leicester.

Aerial mysteries

In reply to Steve Ball's query (April) about old VHF 405-line TV aerials, I think I might have the answer. He found lengths of coaxial cable inside the elements of a 1960s Band I aerial, and suspected that the manufacturer might have put it there to make the elements heavier and thus shorten the life of the product. Planned obsolescence was probably around in those days, but this wasn't an example of that philosophy. In fact the purpose was to make the aerial last longer.

The rods of a Band I aerial were between two and three metres long, and were made of 12mm aluminium tube. They were very light and whippy and would often oscillate, like a tuning fork, in the wind. The result was a low droning noise that could travel down the chimney and annoy the customer. Before long the aluminium would fatigue and the rod would fall off. The problem was solved when someone discovered that filling the rods to make them heavier prevented the oscillation. Commonly used fillers were oily rope and a mysterious grey fibrous substance. Sawdust was also used and, as a child, I delighted in taking a scrap rod out of dad's van and using it to make a sawdust trail down the street!

Cheap aerials usually didn't have a filling, and the rods were often made from rolled strip rather than tube. This meant that there was a minute gap that

ran the full length of the rod: with the wind in a certain direction, these rods could emit an eerie whistle.

The problem of physical, as opposed to electrical, resonance is still with us. Sometimes a 4m aerial mast will vibrate in the wind. The cause seems to be an accidental combination of the load carried and the exact fixing points. The oscillation frequency is sub-audible, but there's a lot of energy there, as you will find out if you put your hand on a vibrating mast! I've found that a good cure is to fit another aerial about half way up the mast.

For anyone who is interested in old 405-line aerials, there's a section of my website called ancient aerial photography. The website is at <http://www.wrightsaerials.tv/index.html>
*Bill Wright,
Micklebring, Rotherham.*

With reference to the aerial rod mystery mentioned by Steve Ball, Band 1 rods were often filled with sawdust and corked to prevent the 'organ pipe' effect in high winds. The noise produced by open aerial rods (and masts) could be excessive and result in loss of sleep in storm conditions. Snoddies type dealers resorted to cheaper solutions, and often any odd piece of cable would be used. A 20ft alloy mast

produces a very deep low-frequency resonance in a force 9 gale: add to that the higher-frequency rod resonance and life could be difficult.

I hope that this answers Steve's query. There are fewer of us around now who can remember the immediate post-war era of 'gas tellies'!

*Ron Bravery,
Brighton.*

I think I can shed some light on Steve Ball's query about TV aerial rods filled with coaxial cable. In high winds the rods used to vibrate and resonate a terrible noise down the chimney. I have seen rods filled with sawdust, wooden dowels and of course coaxial cable. Sometimes we would put sheet rubber strips between the rods and the mounting boom to reduce the noise.

*Derek Dell,
Dawlish, Devon.*

Picture quality

With reference to Martin McCluskey's letter (March) on the quality of digital reception, I experienced dissolving pictures in the presence of minimal interference with the old ONdigital service, while satellite signals tend to have a watery, 'about to dissolve' look when viewed close up, though this is not so noticeable at a distance.

Last year the local cable firm offered an upgrade from the poor, unreliable ana-

logue service. I had this installed, with some reservations. But I must say that the results are superb, with none of the dissolving quality evident – indeed I would say that it's equal to first-class conventional off-air reception.

My main domestic set is a 30-year old plus RGD Model CR20, fitted with the ITT/KB CVC5 hybrid chassis. With the abysmal quality of many more recent sets, perhaps one needs a G8 or CVC5 to appreciate the latest technology!

As for the NTSC conversions that Martin also mentioned, there have been considerable improvements in some cases since 1996. Programmes such as *CSI* and *Law and Order* are two examples.

So I don't think the future looks too bad. At least our old sets won't become obsolete.

*Brian Renforth,
Wallsend, Tyne and Wear.*

Grundig Model M70-2701

In his March issue Service Casebook Michael Maurice mentioned a Grundig M70-2701 that had broken down twice, for different reasons. To prevent failure of the chopper FET and control IC, the values of the 68kΩ and 270kΩ series resistors should be changed to 150kΩ and 180kΩ (2W). This balances the potential dropper and prevents failure of one of the pair.

*Richard Howell,
Wellington, New Zealand.*

HELP WANTED

The help wanted column is intended to assist readers who require a part, circuit etc. that's not generally available. Requests are published at the discretion of the editor. Send them to the editorial department or email to t.winford@highburybiz.com

Wanted: Used but working Nicam module for the Panasonic S-VHS Model NV-HS900B. The part no. is VEP07787K Paul Hardy, 35 Elderdene, Chinnor, Oxon, OX39 4EQ. Phone 01844 354 878 or email paul_hardy@compuserve.com

Wanted: Circuit diagram for the Philips car radio Model N4X39T, also an output transformer for it. S. Stevenson, 17 Lovell Rise, Eastwood, Essex, SS9 5UB. Phone Steve on 01702 522 929.

Wanted: Cassette-down switch for the Sony Betamax VCR Model SL-C30UB, second-hand or new. Phone Malcolm Parr on 01480 467 723 or email

malcolm@parrtv.freeserve.co.uk

For disposal: B&K 490 CRT rejuvenator, three-meter type. With 11 bases, manual and base list. As new condition. Phone Mark Chandler on 020 7430 3093 or email mark@chandler9594.freeserve.co.uk

Wanted: Service manual or circuit diagram for the little CTV Model TV60, a 5-5in. CRT-type portable originally distributed by Kingavon Home & Leisure. Please email Anthony Bullock at ajb@sphynx.demon.co.uk

Wanted: Circuit diagram for the FM/AM radio section of the Sony CMT-EP30 mini hi-fi system. It uses the LA1823 tuner chip. Any information gratefully received. Please phone David Bolt on 01473 780 833 (Ipswich) or email d.bolt@tesco.net

For sale: *Television* magazines from 1987 to 1992. Some issues missing – 62 copies in all. Phone Mike on 01758 613 790.

Wanted: Circuit diagram or service manual for the Canon fax machine Model B200S (BHT04063). Phone Steve Roberts on 01687 462 189.

Wanted: Replacement line output transformer for the Fidelity Model CTV14R, with the conversion PCB that goes with the replacement type that's no longer available from SEME. Also a remote-control unit (LCD type) for the Akai VSA650 VCR. Colin Pearse, AES Electrics, 54 Nutfield

Road, Merstham, Surrey, RH1 3EP. Phone 01737 217 507.

For disposal: Copies of *Television* from 1975 to 2003, U-View circuit books, service manuals, spare parts and test equipment. Phone David Miles on 0151 932 1419.

Exchange/wanted: Philips W66ESF002X44 and LG W76QAG280X10 tubes in exchange for a Philips W66ECK001X14 tube. Also require a head preamplifier panel for the Ferguson S-VHS VCR Model FV39. Allan Crathorne, 2 Harden Close, Walsall, WS3 1BU. Phone 01922 401 130.

Wanted: Remote-control unit for the Aiwa VCR Model HV-FX3500K. The unit has a jog dial and shuttle ring. Phone Brian Haberland on 01726 813 013, evening if possible.

Wanted: CRT type A63-11X or equivalent for a set fitted with the BRC/Thorn 2000 chassis. Also a Philips N1500 VCR and any dual-standard colour sets. Phone S. Eaton on 0114 257 879 or email julie.eaton2@btinternet.com

Wanted: The following PCBs, working or with minor faults: IF/tuner panel for the Sony Model KV24WX1U (BE3D chassis); video board for the Sharp Model DV51083H; and a power board for the Mitsubishi Model CT2525. Phone Mr Grainger on 01384 566 497 or email brownservices@chapmanselectrical.co.uk



WHAT A LIFE!

Over to you, readers! Donald Bullock comments on letters and emails he's received in recent weeks

A number of readers have sent me letters and emails in recent weeks. Many thanks to you all – they are always welcome. In the last couple of columns I've promised to mention the interesting points that have come up, so here goes.

Douglas Carson of Cumbria tells me that he is now sixty and has been in the trade since 1959. It seems that his business, reconditioning and selling appliances, is getting harder each year. He thinks he might take up writing instead!

"I called on a retired school teacher today" he writes, "because her cordless headphones had expired. The battery flap was missing, and as a result the batteries were moving about under their foam pad. I decided to substitute a piece of card, secured with sticky tape, and asked her if she had the top of say a cornflakes packet. She went off to look.

After five minutes or so she returned, fingering her chin. 'I haven't a cornflakes packet' she announced, 'will the top of a Rice Krispies packet do instead?'"

David Newman of Streatham, London, who entered the trade in 1956, comments on the advent of the transistor. I'll quote from his email: "I remember Shockley, Bardeen and Brattain's discovery of the 'transfer-resistor' effect, the basis of the transistor. As a boy I had a book called *The Boys' Book of Crystal Sets*, which contained a circuit for an 'amplifying diode'. I made one myself, using a piece of crystal and two cat's whiskers, in effect a solid-state triode. But Shockley and his associates worked out the theory, and went on to develop practical devices. What they couldn't have known of course was that they were paving the way to our present computerised world. Where would we be today if electronics had taken the solid-state path much earlier?"

Well, Dave, one of my early customers, an electronics enthusiast, once assured me that by inventing the thermionic diode

Fleming put electronic development back by a quarter of a century!

Early projection sets

Reminiscing further, Dave recalls that one of his first jobs in the trade was to replace a Mullard MW6-2 tube in a Philips projection set. It cost £6.10s, which was a lot of money at the time, and during his efforts at fitting the EHT cable he managed to destroy it. "Not a good start" he says, "I was always in trouble with those early projection sets."

Who wasn't? I suffered at the hands of projection sets myself, and knew several engineers who were driven half mad by them. One developed a nervous rash that defied cure – it continued until he left the trade. Another developed an embarrassing tic. The mechanical jobs would be given to juniors, while qualified engineers concentrated on the circuitry.

On one occasion Dave fitted a new projection tube then switched the set on and stood petrified as a brilliant white line appeared across its face. His boss rushed over to switch the set off, but the damage had been done – the tube had a burnt face. "The set used valves" he continues, "including some EB91 double-diodes that provided CRT protection, switching the tube off in the event of field or line collapse. Their heaters were series-wired separately, so that removing one didn't kill the main heater chain. Someone had at some stage removed one of these EB91 valves. I later learnt that this was sometimes done as a last resort, to restore the beam when an engineer couldn't find the cause of its absence. Happy days!"

A Panasonic TX32PK2

In the January issue I referred to an email from Gerry Meek, who had a problem with a Panasonic Model TX32PK2 (Euro-4 chassis). Steven, who has had a lot of experience with these sets, suggest-

"I haven't a cornflakes packet' she announced, 'will the top of a Rice Krispies packet do instead?'"

ed some possible solutions. The symptoms were unusual effects followed by reversion to standby at the first two attempts to switch the set on, an acceptable picture being obtained on the third attempt – after a delay. After listing Steve's suggestions, I added the thought that the problem could be caused by the tube.

Gerry reports that he tried Steve's suggestions then decided to tap the neck of the tube gently. This worked, the picture appearing in the normal way. He repeated the treatment twice more for luck, and the tube has behaved itself ever since.

The set's owner naturally fears that the fault may recur, and has contacted Panasonic for help in meeting the absurdly expensive (£300) cost of a new tube.

More tube tapping

Tube neck tapping was featured in another email, from Jim Corrigan in Glasgow. "I've been in the trade for twenty five years" he comments, "and never cease to be surprised by the flow of nutters that come my way. The latest lives in the east end of Glasgow, in a rather rough housing estate with a wide spectrum of head cases. His complaint, about a monstrous 32in. Sanyo EB6 receiver, was a 'green picture'. The house was a shambles, and I had to fight my way through acres of junk to reach the set, while being attacked by a savage Jack Russell terrier. As I switched the set on the owner snatched the dog away, smacked it around the head and launched it through the back door. At that it began to gnaw at the door in protest."

By the way Jim, as you all know, I do love dogs . . .

Jim goes on to say that the picture came up green, so he removed the back of the set and gave the neck of the tube a sharp tap with the handle of his screwdriver. This instantly produced a normal picture. He gave the customer a reverential look and told him that a new tube would be needed, at great cost.

"But you've just cured it!" the customer exclaimed.

"That was only a test" Jim replied, "it won't last."

"Aw, don't confuse me with technicalities" the customer continued, "I'm just

happy that you made it work again."

Jim departed hastily, after giving the tube another tap and noting that it still behaved. Two days later the customer came on the phone.

"That test you carried out has gone again" he reported, "like you said it would. But it was cheap compared to the cost of a new tube. So can you come and do it again? I'll pay of course . . ."

Picture quality

A couple of letters in the March issue interested me and brought back memories. Martin McCluskey's reference to digital picture quality was one. He describes digitally-derived pictures as unnatural-looking, of low definition and with clearly visible pixellation effects where there is movement. I think he's got most of it in one.

Our TV pictures in Spain exhibit all the deficiencies he mentions plus another one that's even more maddening, and is the result of the low signal level imposed by broadcasters. I refer to breakup of the picture, and a metallic clicking and interruptions to the sound, when the signal level falls a little. If the signal was an analogue one we might get a little noise (snowy vision) and, in severe cases, a little hissing on the sound. But the picture would continue to be viewable, which it isn't with digital transmission. Almost as annoying is the pixellation effect he mentions with movement. This is particularly evident when the signal level falls ever so slightly. The non-moving parts of the scene stay rigid but the moving parts, which are usually people and often close-ups of faces, break up into jumping mosaic patterns. The effect is hideous.

Broadcasting standards

All this is, I suppose, just one more step in the decline of broadcasting standards. Our radio programmes are no longer a patch on what they were, neither in their content, their presentation nor their technical quality.

Having been around for a fairly long time, I am convinced that the present troubles must all be laid at the door of those who, fifty years ago, set out with such dedication to destroy the BBC's monopoly. The BBC was, they argued, old-fashioned, authoritative and stultified. It gave viewers and listeners not what they wanted but what was considered to be good for them. A little competition could, they suggested, only be a good thing.

I followed it all and remember it well. The Campaign for Change proposed commercial television. This brought uproar in the House of Commons, but the Campaign insisted that it would give

the public a wider choice and that the competition would improve programme standards. It eventually won the day, though numerous safeguards were imposed by Parliament. These included an embargo on sponsored TV (where the sponsor, as paymaster, controls the programme content), a severe limitation on advertising time per hour, in well spaced out segments, and certain public-service responsibilities.

What could not be controlled however was the over-familiar 'matey' presentation of the commercial programmes or their quality. The power of money in a free-for-all was not appreciated. With my slight knowledge of publishing, I saw at once that before spending money an advertiser would want to be sure that his advertising would be seen by as many people as possible. Thus programme content and presentation would be carefully tailored to this end – 'dumbed down' as we say today.

And so we were treated to ITV. I vividly remember the first bit I saw, in that sunny yet cosy Foyles' workshop. The presentation was a deliberate shambles, and the programme featured a precocious and strident Noelle Gordon, with an unruly trio led by a shark-nosed chap who occasionally pounced at an electric organ. They were delighted with themselves, and the unscripted 'show' contained about six laughed-off slips a minute.

I phoned ITV to ask what they thought they were up to. A hysterical voice at the other end told me that I had just seen the new face of British television. This was not entirely accurate. The situation was to worsen rapidly. The advertisements got longer and became more strident, while the presenters came to resemble and sound like drop-outs. Things like 'ratings figures' were introduced, and the routed BBC lowered its standards to gain audience share. Channels Four and 5 came, also commercial radio. Instead of rising as a result of the competition, the quality of programmes slumped to lower and lower levels. And the BBC was caught up in the general deterioration.

Those Philips sets

I also agree with Martin about the excellent quality of the Philips G8 chassis and its picture. Having suffered at the hands of the initial Philips G6 colour chassis, I bought a G8 with some trepidation. But I was delighted with its performance and the ease of servicing. One afternoon, when I slipped back to the house to see Greeneyes and toddler Paul watching a children's programme, two visitors called: my accountant and an insurance man. They were both impressed with the G8 and asked if I could obtain sets for them.

The sets that subsequently arrived were in fact fitted with the later G9 110° chassis, which was troublesome to say the least. I resolved never again to sell a TV set to a friend or colleague – and never to service their sets either. To do so is a fine way of putting such relationships under considerable strain. It can also damage your pub life!

Downleads

The other letter that caught my eye was from Ron Bravery, who reckons he gets some of Snoddies' customers! I've also experienced many a pool of water, some inside sets, caused by rainwater running down inside a coaxial cable. In one such case, many years ago, an old lady's BBC-only set was destroyed. She asked us to supply a new set that would provide her with the new TV (she hadn't read my comments above of course!). So the sales force visited her home in the Cotswolds, accompanied by the aerial riggers.

The problem was to find enough Band III signal. At last the riggers gave up their attempts on the roof and called it a day. They threw their rig down by the front door. At that moment the customer ran out and said "you've done it at last, a lovely picture, come in and see".

She was right. The aerial boys left their rig where it was, and the lady grew a climbing rose over it. Thereafter she used her back door!

Help wanted

I need a bit of help with a technical problem. Greeneyes likes the sound quality we get from my new stack of Technics audio unit separates, but she's not too keen about having it all piled up in her nice, tidy lounge. So I thought I would be clever: put it all behind a room divider and operate it from my usual chair by bouncing remote-control signals over the divider via the ceiling. In fact there are two remote-control units, one for the amplifier and one for the CD player. But my scheme doesn't work as well as I had hoped, and I'm told that what I need is a remote-control extender – a system that picks up the infra-red remote-control signals, converts them to RF, then converts them back to IR within sight of the unit being controlled.

Does anyone know enough about these newfangled things to give me some advice? What type to get, and from where? As always, I can be reached by email at donald@wheatleypress.com

Oh, and keep the comments rolling in!

Days of DC

We nowadays never have to think about the mains supply: just plug in and go. It was not so in the period up to the early Sixties however, when AC was distributed at several voltages and there were still quite a lot of areas that had a DC supply. Keith Cummins recalls the days of DC mains supplies, and explains why they were eventually abandoned

A Nowadays we don't think twice about plugging into the standard 240V, 50Hz mains supply. But in years gone by this was not always so: there could be several different types of supply in one town. When, as a young man, I started to work in the TV trade in Southampton we had to contend with 200, 210, 220, 230 and 240V, 50Hz AC mains supplies plus large areas of the town that were supplied at 200V DC. How did this mixed bag come about? Historically the DC came first, so it is interesting to consider how it was distributed and its effect on later power-distribution decisions.

When electricity was first introduced and started to displace gas lighting, it was generated by local power stations that supplied the immediate higher-population

areas. Town supplies were independent: there was no National Grid, so the local electricity authorities were likewise all independent. They normally supplied DC at a range of voltages between 200-240V, and DC became the conventional, established supply standard. This was to lead to severe complication of the distribution system as, with time, the areas being served increased – as we shall see later.

Development of power distribution

First however some details of DC generation and distribution, as it first developed. A three-wire system was normally used to distribute DC, as shown in Fig. 1. Two generators were connected

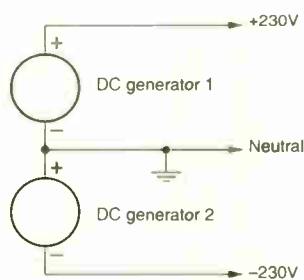


Fig. 1: The basic three-wire DC distribution arrangement.

in series, with their common centre connection earthed and connected to the centre neutral line. As a result the two live generator outputs were positive and negative with respect to neutral. Usually one side of the street would be fed from live positive and neutral, the other side being fed from live negative and neutral. The system had the advantage that the neutral line had to carry only the difference current between the two sides of the street, and consequently needed just half the cross-sectional area of copper conductor. It was common practice to run large motors etc. from the two live lines, i.e. from double the nominal mains voltage, thereby halving the current.

The situation could be particularly hazardous for TV engineers working on the 'negative-live' side of the street. The chassis of an early AC/DC TV set would be permanently live: there was no option of reversing the mains-lead connections. The DC was inherently more dangerous than an equivalent AC supply, since

current flow through the body would tend to lock muscles rather than throw the victim clear, as happens with AC. So we had to be careful. There was an advantage with DC however: it was demonstrated by my grandfather, who charged his car battery by connecting it in series with an electric fire!

As the suburbs extended so did the need to distribute electricity over greater distances. It was not possible to extend three-wire DC systems indefinitely however, because of the currents and voltage drop involved. It was recognised that high-voltage AC, together with the use of transformers, would enable power to be distributed efficiently over large distances. But there was one snag: at the time, in the 1920s, it had been decided to generate AC at 25Hz. This couldn't be used for lighting purposes, because of the objectionable flicker. So the AC distributed to outlying areas needed to be converted to the three-wire DC standard.

Sub-stations

Sub-stations that contained rotary machines were set up for this purpose. These machines were AC-DC converters with slip-rings at one end and a commutator at the other. The incoming three-phase 25Hz AC, at typically 11kV, was first fed to transformers with split secondaries for each phase, thus providing a six-phase supply for the rotary converter, which ran synchronously with the supply frequency. Two such machines were of course required to feed the three-wire DC distribution system.

Because of the amount of control and maintenance required, rotary-converter sub-stations were permanently manned on a shift basis. As the load varied, more or fewer machines were required and decisions made about their operation. Before it was switched to the DC system, a machine had to be run up to synchronous speed. This was often achieved by the use of an auxiliary 'pony' motor that ran the machine up to speed before power was applied to the slip-rings. The machine would then lock into synchronism with the supply, its output being checked before connection to the local distribution network. These sub-stations were substantial installations, with machines that were often capable of delivering 2MW.

Complex, manned sub-stations were a considerable overhead for the electricity

authorities. So the advent of the mercury-arc rectifier was greatly welcomed. This device, which operates like a multi-anode diode, needed little maintenance and made the introduction of unmanned sub-stations possible. A typical rectifier set-up is shown in Fig. 2.

The six phases from the transformer were fed to the six anodes of each rectifier. Auxiliary electrodes keep the discharge 'struck' for starting and low-load operation. When a 25Hz AC supply is being rectified, there will be a $6 \times 25 = 150\text{Hz}$ ripple on the resultant DC. This proved to be of little consequence, apart from the risk of interference with DC-only radio receivers – in some cases these needed improved HT supply smoothing. The mercury-arc rectifier was very efficient. Figures of better than 90 per cent could be achieved at full load.

Balancing

The three-wire system was designed to operate with a reasonably-balanced load. But, under variable conditions, it was possible for an unacceptable degree of imbalance to occur. The result could be asymmetrical rectifier loading and excessive voltage drop in the neutral line. To overcome the problem a self-balancing arrangement was used, see Fig. 3.

This has two balancing machines with their shafts coupled together. Each can run as either a shunt motor or generator, depending on the loading. If one side of the system is lightly loaded, the relevant machine runs as a motor, driving its companion which generates extra power for the more heavily-loaded side. In a perfectly-balanced situation the two machines run in an idling condition. Note the cross-connection of the fields of the two machines. It was claimed that this improved the sensitivity of the system to imbalance and provided more precise compensation.

Poor regulation

Despite the foregoing description, I recall some really appalling regulation with nominal 200V DC supplies that could fall to 165V. This resulted in dim 9in. pictures with 14in. black-and-white TV sets during cold weather!

AC/DC television and radio receivers were available but the situation was different with radiograms, which usually had an AC turntable motor. One customer of ours ran his radiogram from a rotary transformer, whose frequency was not very stable and also depended on the supply voltage. The turntable's speed stability was generally terrible, and the music sounded awful. But the

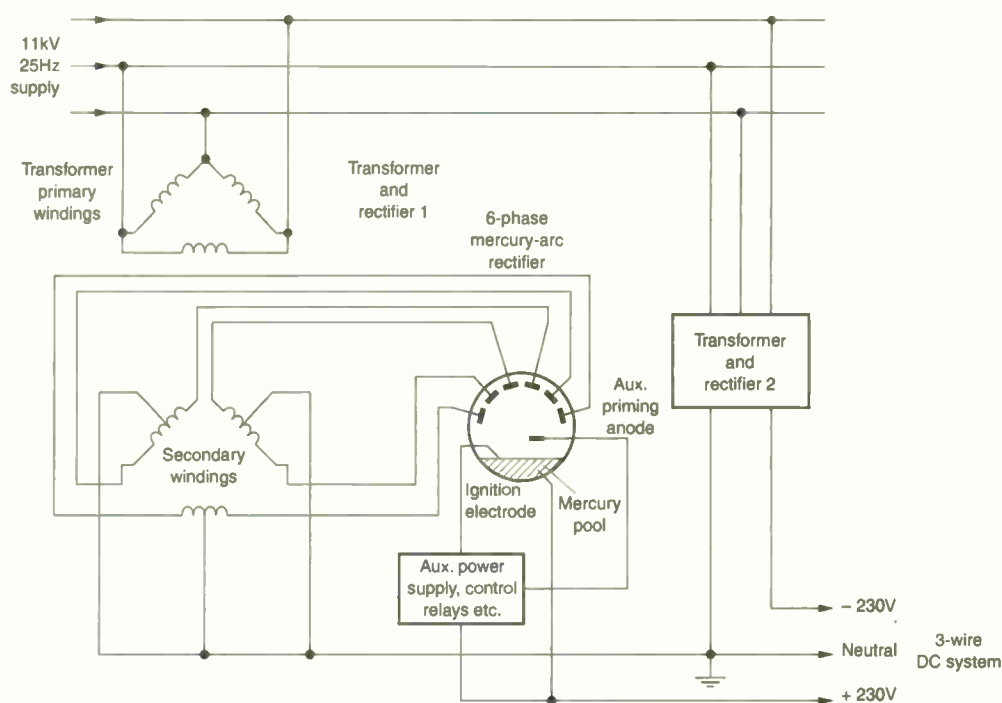


Fig. 2: Simplified mercury-arc rectifier circuit.

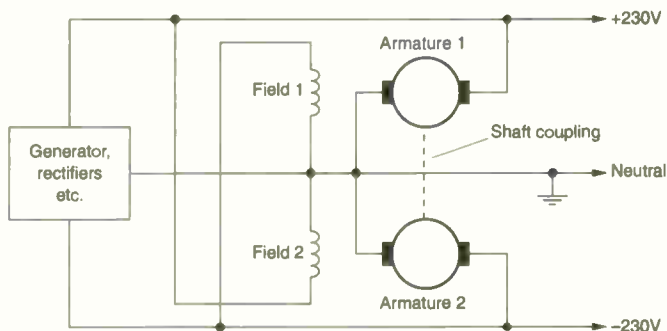


Fig. 3: A three-wire balancing system.

customer thought it was better than nothing. Perhaps we were all more tolerant in those times.

Rationalisation

By 1929 the Electricity Commissioners had decreed that the frequency of all future AC supplies should be 50Hz. Some authorities had already come to this decision and distribution at 50Hz, which is flicker-free, was well under way, leading to the construction of the National Grid. The days of the complex electricity supply sub-station were numbered: AC sub-stations only needed transformers. It was not until the early 1960s however that 240V AC was established throughout the country and the few remaining DC supplies were superseded. As laid down in the contemporary IEE Regulations, 240V AC and the ring-main with 13A

sockets eventually took over everywhere.

Looking back, I can still recall my surprise at the size of the arc drawn when unplugging an electric fire from an unswitched, DC-powered 10A two-pin socket. There was no quenching of the arc as occurs with AC. So you had to be quick to avoid burning away the plug pins! The arc produced an ominous hissing sound.

Mains sockets

Finally, how many different types of mains socket can you remember? We had two-pin sockets rated at 2A, 5A, 10A and 15A. Then there were three-pin sockets rated at 2A, 5A and 15A. Lastly there was the dreaded Wylex plug, which was used with some cooker mains switches and was generally used to connect kettles. How many of you recall that one?!

Digital Radio Mondiale

Last year saw the launch of Digital Radio Mondiale, a new digital radio system for use in the long-, medium- and short-wave bands. The DRM consortium was formed in 1998, and in 2001 the ITU recommended the system for worldwide use. **J. LeJeune** describes the technology and lists current transmissions

Digital Radio Mondiale (DRM), a new digital radio system for use in the long-, medium- and short-wave bands, was launched in 2003. The DRM consortium was formed in 1998, with the aim of replacing existing analogue services in these bands with something better, and in 2001 the ITU recommended the system for worldwide use. The DRM launch was in June, at Geneva, when a number of the world's top broadcasting organisations started to provide services.

Pros and cons of HF broadcasting

Let's start by considering briefly the pros and cons of HF broadcasting. The advantage is mainly the coverage achieved, the disadvantage being poor audio quality. Some short-wave broadcasters now use FM transmitters, fed either by satellite or landline, to reach specific target areas. Compared to HF transmissions, FM is vastly superior. Poor audio quality also affects a broadcaster's style. The presence of interference means that the broadcasting of speech has to be slower, with ponderous enunciation, while the narrow bandwidth means that music is emaciated and is therefore not strongly featured.

DRM opens up new possibilities for existing short-wave broadcasters. The

audio quality is good, and the coverage in the MF and HF bands is the same as with analogue AM stations. In addition there's the possibility of running a data service alongside the programme material to add station identification, programme contents, alternative frequencies etc. The style of former years will not suit the new medium however, and there's a risk that audiences could be lost unless the full potential of DRM is exploited.

Programme origination and distribution

As with normal production techniques, the programme material can be edited and recorded. When the broadcaster uses a computer-based digital-editing suite with hard-disk storage, some compression is required to conserve disk space. The use of a high bit rate at the origination stage, for example 384kbits/sec MPEG Layer 3, is essential however to achieve high quality. This will offset the effects of subsequent compression in the distribution chain and at the transmitters. The data that leaves the studios is passed to the transmitters via the distribution networks: minimum compression in these links is desirable.

The DRM Multiplex Distribution Interface (MDI) encodes the audio at the studio output. The resultant bit stream contains the compressed audio and service data, such as the station ID, a 128-character text message and a list of alternative frequencies. An MDI can encode up to four services, with the attendant data streams sharing the available bit rate. The additional information, with error protection as well, adds a further 25 per cent to the payload. Thus a typical MDI stream fits neatly into a transmission channel of between 32-64kbits/sec. The precise requirement depends on DRM encoder and modulator settings.

This simplified description assumes that all transmitters are fed with the same data stream and transmit the same content. If the same programme is to be broadcast from different transmitters, it will be

essential to produce the master signal at as high a bit rate as possible to avoid the effects that can be introduced by cascaded encoders.

The system can be tailored to meet the needs of the band in use and the bandwidth available. This can provide simulcasting in digital format alongside an analogue SSB signal within a single channel or, at the other extreme, the use of adjacent 9kHz channels. A choice of six modes enables the transmissions to be matched to the conditions. For LW and MW services bit rates of 23.63-30.54kbits/sec are recommended, using 16QAM. For SW use the bit rates can be 20.96-29.8kbits/sec. The higher bit rates are required for stereo audio programmes.

Transmission

For broadcasters that use several transmitters simultaneously, DRM offers the possibility of a synchronised chain radiating the same service. The SFN (Single Frequency Network) concept first came into being with the use of COFDM (Coded Orthogonal Frequency Division Multiplex) transmissions for terrestrial digital TV. The effect of an SFN is similar to that with RDS via FM, but with seamless transition from one transmitter to another. DRM offers the alternative of MFN (Multiple Frequency Network) operation, with the same service being broadcast by transmitters that use different frequencies. This feature is valuable for SW use, where propagation conditions vary throughout the day.

MFN operation requires a receiver that's equipped with AFS (Alternative Frequency Switching) software and is regularly reprogrammed over the air to take into account daily and seasonal changes in conditions. A receiver equipped in this way will switch itself to the strongest signal that carries the required service and will have noticeably reduced audio dropouts. MFN operators have to maintain a transmission time and frequency database that can be downloaded to receivers via the transmitter network.

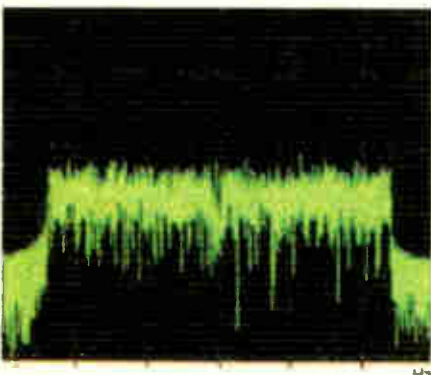


Photo 1: Oscilloscope display of a DRM signal, occupying a 9kHz channel, picked up with a spectrum analyser.

TELEVISION BOOKS

AND HOME ELECTRONICS REPAIR

The Television Book Service offers access to our team of specialist publishing experts. We can order any book or CD-ROM currently in print from *War And Peace* to the *Newnes Guide to Television and Video Technology*. All books are delivered free of charge within the UK unless otherwise stated. Contact us at the numbers below:

Telephone: **01737 812727** or **01737 812676**

Fax: 01737 813526

Email: salesteam@boffinbooks.demon.co.uk

DVD PLAYERS AND DRIVES

K F Ibrahim
(College of North West London)



This text is based on hands-on experience and acts as a guide to DVD technology and its application, with a special focus on design issues. The principles of the subject are introduced from the basics, and DVD applications are illustrated by genuine technical information.

Aug 2003 ▲ 256 pages ▲ Glossary ▲ Index
PB ▲ Published in UK

Code 0 7506 5736 7

£24.99

ELECTRONIC CLASSICS: COLLECTING, RESTORATION AND REPAIR

Andrew Emmerson



This text encompasses all aspects of buying, collecting, restoring, repairing, sourcing parts, professional services, clubs and societies. The first part covers technical aspects of restoration and details where components can be found; the second presents useful information for collectors.

Aug 1998 ▲ 256 pages ▲ Index
10 halftones ▲ 50 line illustrations ▲ PB
Published in UK

Code 0 7506 5736 8

£21.99

CLOSED CIRCUIT TELEVISION: CCTV INSTALLATION, MAINTENANCE AND OPERATION

Joe Cieszynski



CCTV surveillance is one of the fastest growing areas in the security industry, and this is a thorough guide to the technical side of CCTV – including installation, maintenance, video recording, cameras and monitors. The second edition is fully dual-standard for PAL and NTSC systems.

2nd edition ▲ Sept 2003 ▲ 256 pages
Glossary ▲ Index ▲ PB ▲ Published in UK

Code 0 7506 5738 4

£24.99

DICTIONARY OF VIDEO AND TELEVISION TECHNOLOGY

Jack Tsatsoulin



This work provides comprehensive and contemporary information on the essential concepts and terms in video and television, including coverage of test and measurement procedures. The CD accompanying the text includes an electronic version of the book.

Sept 2002 ▲ 365 pages & CD-Rom
Published in UK

Code 0 7506 5738 5

£29.99

NEWNES GUIDE TO TELEVISION & VIDEO TECHNOLOGY

Eugene Trundle



An exploration of television and video technology. It covers the fundamentals of digital television (satellite, cable and terrestrial) and digital video, as well as providing a grounding in analogue systems.

3rd edition ▲ Feb 2001 ▲ 432 pages ▲ Index
PB ▲ Published in UK

Code 0 7506 4810 4

£17.99

NEWNES GUIDE TO DIGITAL TV

Richard Brice



Covering all aspects of digital television, this text encompasses the electronics of the equipment, data compression, television production, servicing and the different transition methods - terrestrial, satellite and cable. The text has been updated with developments since the 2000 edition.

2nd edition ▲ Oct 2002 ▲ 304 pages ▲ Index
45 illustrations ▲ 15 photographs ▲ HB
Published in UK

Code 0 7506 5721 9

£24.99

INTRODUCTION TO DIGITAL SYSTEMS

John Crisp



This self-study text introduces digital electronics from first principles, before going on to cover all the main areas of knowledge and expertise. It covers the practicalities of designing and building circuits, including fault-finding and the use of test equipment.

Feb 2000 ▲ 302 pages ▲ Glossary ▲ Index
PB ▲ Published in UK

Code 0 7506 4583 0

£18.99

NEWNES DICTIONARY OF ELECTRONICS

S W Amos; R S Amos



Aimed at engineers, technicians and students working in the field of electronics, this dictionary provides clear and concise definitions, including TV, radio and computing terms, with illustrations and circuit diagrams.

4th edition ▲ Mar 2002 ▲ 394 pages
100 illustrations ▲ PB ▲ Published in UK

Code 0 7506 5647 1

£12.99

PRACTICAL ELECTRONIC FAULT FINDING AND TROUBLESHOOTING

Robin Pain (Design Engineer, Cotag International Ltd)



A text using simple circuit examples to illustrate principles and concepts fundamental to the process of analog and digital fault finding. It aims to help the reader tackle any job, from fixing a TV to improving the sound of a hi-fi. A digital multimeter and oscilloscope are needed for these jobs.

Apr 1996 ▲ 284 pages ▲ Index
50 line illustrations ▲ PB ▲ Published in UK

Code 0 7506 3161 2

£21.99

PRACTICAL ELECTRONICS HANDBOOK

Ian Sinclair



A collection of all the key data, facts, practical guidance and circuit design basics needed by a spectrum of students, electronics enthusiasts, technicians and circuit designers. It provides explanations and practical guidance, and includes new sections on SHF techniques and intruder alarms.

5th edition ▲ Feb 2000 ▲ 571 pages
Illustrations ▲ PB ▲ Published in UK

Code 0 7506 4583 7

£16.99

RSGB RADIO & ELECTRONICS COOKBOOK

Radio Society of Great Britain



Only a basic knowledge of electronics is assumed for this collection of electronics projects, and it is ideal for all electronics and DIY enthusiasts and experimenters. Designed by the RSGB, the UK radio amateurs federation, the projects are clearly explained step by step.

Nov 2000 ▲ 336 pages ▲ PB ▲ Illustrations
Published in UK

Code 0 7506 5214 4

£17.99

REFERENCE DATA FOR ENGINEERS: RADIO, ELECTRONICS, COMPUTERS AND COMMUNICATIONS

Mac E Van Valkenburg; Edited by Wendy Middleton



Written by professionals for professionals, this is a complete reference for engineers. As well as addressing radio technology data, it covers digital electronics, computers and communications.

9th edition ▲ Aug 2001
1568 pages & CD-Rom ▲ 1385 line illustrations
HB ▲ Published in UK

Code 0 7506 7291 0

£90.00

SERVICE ENGINEER'S POCKET BOOK

Lewis & Sinclair



This title aims to provide the service engineer with all the necessary information to carry out work on domestic electronics equipment. The coverage ranges from satellite reception to NICAM. Both analogue and digital equipment are covered, and there are chapters on common problems.

Jan 1998 ▲ 238 pages ▲ HB

Code 0 7506 3418 0

£14.99

SERVICING TV, SATELLITE & VIDEO EQUIPMENT

Eugene Trundle



A practical hands-on guide for service engineers, installation technicians and servicing students, this text emphasises the practical business of fault diagnosis and repair of TV, satellite and video equipment.

Revised 2nd edition ▲ Nov 2001 ▲ 336 pages
Symptom index ▲ PB ▲ Published in UK

Code 0 7506 5587 0

£21.99

TELEVISION MICROPROCESSOR IC DATA FILES

J Edwards

Microprocessor ICs are the most complicated part of TV equipment and present special problems to the engineer. This text covers the most popular microprocessor ICs. Each device is presented graphically with the relevant data information given against each pin.

Mar 1997 ▲ 240 pages ▲ 200 line drawings

PB ▲ Published in UK

Code 0-7506-3315-2

£19.99



TELEVISION IC DATA FILES

J Edwards

A compendium of data on all the most common integrated circuits used in televisions. Each device is illustrated with a pin-out diagram, and all the measurements and signal data in the book were taken under actual working conditions. This second edition contains over 70 new ICs.

2nd edition ▲ Jan 2000 ▲ 245 pages

PB ▲ Published in UK

Code 0-7506-4581-4

£18.99



TV FAULT-FINDING GUIDE

Edited by Peter Marlow

A distillation of the most-used fault reports from 11 years of *Television* magazine. Arranged by make and model, it features over 200 reports on over 300 models of television, including diagnosis and repair advice.

Mar 2000 ▲ 387 pages ▲ Illustrations

PB ▲ Published in UK

Code 0-7506-4623-8

£20.99



VALVE AMPLIFIERS

Morgan Jones

The author's straightforward approach, using as little maths as possible, should be of use to those with only a limited knowledge of the field as well as being the standard reference for experts in valve audio. Design principles and construction techniques are also provided.

3rd edition ▲ Aug 2003 ▲ 624 pages ▲ Index

PB ▲ Published in UK

Code 0-7506-5644-8

£29.99



VCR FAULT-FINDING GUIDE

Edited by Peter Marlow

A distillation of the most-used fault reports from 11 years of *Television* magazine. Arranged by make and model, it features over 2000 reports on over 200 models of VCR, including diagnosis and repair advice.

Mar 2000 ▲ 447 pages ▲ Illustrations ▲ PB

Published in UK

Code 0-7506-4624-9

£20.99



VCR IC DATA FILES

J Edwards

This text aims to provide the workshop technician and the field engineer with a convenient method of fault-finding without the need to consult workshop manuals. The most popular ICs used in video recorders are covered. Each device is presented graphically with data given against each pin.

Jul 1998 ▲ 448 pages ▲ 200 line illustrations

PB ▲ Published in UK

Code 0-7506-2993-8

£20.99



VIDEO AND CAMCORDER SERVICING AND TECHNOLOGY

Steve Beeching

A comprehensive guide to domestic VCR technology and repair techniques. This edition brings the information fully-up-to-date, with expanded coverage of camcorders, sections on DVD equipment and the latest VCR technology.

5th edition ▲ Apr 2001 ▲ 323 pages

Illustrations ▲ PB ▲ Published in UK

Code 0-7506-5829-7

£20.99



VIDEO DEMYSTIFIED

Keith Jack

This edition has been updated to include information on digital television, datacasting, interactive video, digital camcorders and VCRs, and video interfacing. Coverage is international, including European, Asian and North/South American video standards, methods and techniques.

3rd edition ▲ Jul 2001 ▲ 784 pages & CD-Rom

References ▲ Glossary ▲ Index ▲ PB

Published in UK

Code 0-878737-54-6

£50.00



THE DIGITAL SATELLITE TV HANDBOOK

Mark E Long

A handbook and CD-ROM pack on digital satellite television. It provides an overview of all the digital TV platforms in use world-wide. It includes satellite coverage maps and transmission parameters that readers will need to receive digital TV services from any location in the world.

Sept 1999 ▲ 207 pages & CD-Rom ▲ PB

Code 0-7506-7171-8

£41.99



NEWNES GUIDE TO RADIO AND COMMUNICATIONS TECHNOLOGY

Ian Poole

This is a guide to the technology and applications of modern radio and communications equipment. The author's approach provides a useful foundation for college students and technicians seeking an update on the latest technology.

Jul 2003 ▲ 352 pages ▲ Index ▲ PB

Published in UK

Code 0-7506-5412-3

£16.99



VALVE RADIO & AUDIO REPAIR HANDBOOK

Charles Miller

A practical manual for collectors, dealers and service engineers of valve audio and radio equipment. This edition includes new material on restoration and valve amplifiers.

2nd edition ▲ Apr 2000 ▲ 280 pages
▲ 10 halftones ▲ 50 line illustrations ▲ PB
Published in UK

Code 0-7506-3995-4

£20.99



NEWNES TV & VIDEO ENGINEER'S POCKET BOOK

Eugene Trundle

This updated text provides a pocket tool for service engineers. It presents a range of essential information in a compact form, covering television reception, satellite and cable television, video recorders, colour camera technology, teletext and fault-finding.

3rd edition ▲ Oct 1999 ▲ 512 pages ▲ HB

Code 0-7506-4174-0

£17.99



TELEVISION ORDER FORM

Please order or search the following:

Code	Description	Qty	Price

POSTAGE & PACKING FREE IN THE UK* TOTAL

Name Daytime Tel

Address

Postcode

I enclose a cheque/postal order value £ payable to 'Boffin Books Ltd'

Please debit my Access/Visa/Switch/Delta card Issue number (Switch only)

Card Number Expiry Date

Signed

* Postage charges outside the UK available upon request or email: salesteam@boffinbooks.demon.co.uk

Post to: Boffin Books Ltd, 24 Walton Street, Walton-on-the-Hill, Tadworth, Surrey KT20 7RT, UK

If you are ordering by credit card, need further information or would like to use our search facilities, call

01737 812727 Fax 01737 813526

The order/telephone is open from 9am to 5pm, or leave your order on our out-of-hours answering machine or email us at

salesteam@boffinbooks.demon.co.uk

When placing orders please quote: Name Address (house & delivery) Details telephone number Bank/Credit card number

Expiry date Details of order. Please note that prices may change, but are correct at time of going to press.

Repair notes on **Toshiba** projection TVs

John Coombes provides fault-finding guidance on sets fitted with the **C5SS**, **C8SS** and **C0OP** projection chassis

Our company has sold and serviced many Toshiba projection TV sets in recent years. The following notes summarise our servicing experience with them.

Model 43PJ93B (C8SS chassis)

There are two power supply circuits, a standby supply that provides a regulated 5V output (+5V-1) and the main chopper power supply. The standby supply is fed from a small mains transformer and, amongst other things, provides the DC feed to the relay (SR80) that controls the input to the chopper circuit. Fig. 1 shows the arrangement. A second relay (SR81) shorts out the surge-limiting resistors after an initial delay – this reduces unnecessary dissipation during normal operation. The standby circuit is immobilised when the X-ray protection plate interlock is disconnected. A short across the standby 5V supply will result in a dead set with no red LED display. The usual cause of this is failure of the 6.2V zener diode D7709 on the convergence PCB – check it by replacement.

The main power supply is based on an STR-Z4267 chopper IC (Q801). There are four windings on the isolated side of the chopper transformer, with each one feeding a bridge rectifier. Fig. 2 shows the

HT rectifier circuit. There is also a half-wave voltage-doubler circuit that generates a 36V supply for the convergence board. A hybrid IC (Z801, type HIC1019) on the secondary side of the chopper circuit is used for excess current (sensed across R853) and over-voltage protection and for regulation error sensing. Regulation feedback is applied to Q801 via optocoupler Q862 (type TLN621).

If, when the set is switched on, it trips to standby followed by four clicks from the relays there is no mains input to the chopper circuit. This usually means that there is an overload. The first check is to isolate the deflection panel by disconnecting BB21 and BB22. The voltage across the HT smoothing capacitor C886 (47 μ F, 160V) should then be 125V, with or without a 60W lamp as a dummy load. If the HT voltage is correct there is probably a fault in the line output stage. Note that the 2SD2253FA line output transistor Q404 incorporates a parallel diode. The feed to the line output stage is via R444 (0.39 Ω , 1W). Note also that in projection models there are three sets of scanning coils: the field scan coils are in series and the line scan coils in parallel.

If there is no HT at C886, check whether the 2A circuit protector Z856 is open-circuit. If it is, check the HT bridge rectifier D860 (type D4SBL40) for shorts and the HT reservoir capacitor C876 (330 μ F, 160V).

If the HT rectifier circuit is OK, check for shorts across the other rectifiers on the secondary side of the chopper circuit then, if necessary, turn to the primary side. The mains bridge rectifier is D802 (type LN65860) while C810 (560 μ F, 400V) is its reservoir capacitor. If there is 300V across C810, check the chopper chip Q801 (STR-Z4267) by replacement.

There are quite a lot of useful check points. If tripping is cured by disconnecting fuse F870 (4AT) there's a fault in the convergence circuitry – F870 is in series with the voltage-doubler circuit

that produces the 36V supply. The connections to the deflection PCB are sockets BP21 and BP22: 125V should be present at pins 6, 7 and 8 of BP21.

If there is a problem in the field output stage, check its 35V supply at test point P415. This supply is derived from the line output transformer via R327 (3.3 Ω , 1W fusible), D302 (type EU2A) and the current sensing resistor R370 (1.5 Ω , 0.5W), with C310 (2,200 μ F, 50V) as the reservoir capacitor and C320 (100 μ F, 50V) for smoothing. If the voltage is low or missing, suspect the field output IC Q301 (LA7833S). Usually if Q301 is faulty the relay will click on and off, shutting down the power supply.

The field output stage can be isolated by disconnecting R327. Field collapse won't show, as CRT blanking comes into operation. If the tripping stops and the receiver doesn't go into standby, sound will be present and the cause of the fault will be in the field output stage. To avoid CRT damage, don't run the receiver for long with R327 disconnected.

The heater supply for the CRTs is derived from the line output stage. It's rectified for protection purposes (X-ray protection). You can check for correct operation at test point P416, where the voltage should be about 22V. This voltage is fed back for protection purposes to pin 13 of the HIC Z801.

If the red LED at the front is lit, the standby power supply is providing its 5V output (+5V-1).

There is another protection system that's built into the DPC E/W PCB and is related to the HT supply to the RGB output stages. The RGB HT supply is derived from the line output transformer and should be 200V across C446 (33 μ F, 250V). Note that the set will trip to standby if operated without the DPC PCB being in position, because there is no EW control and the voltages in the line output stage will rise above the trip level. The protection-trip latch is within the HIC

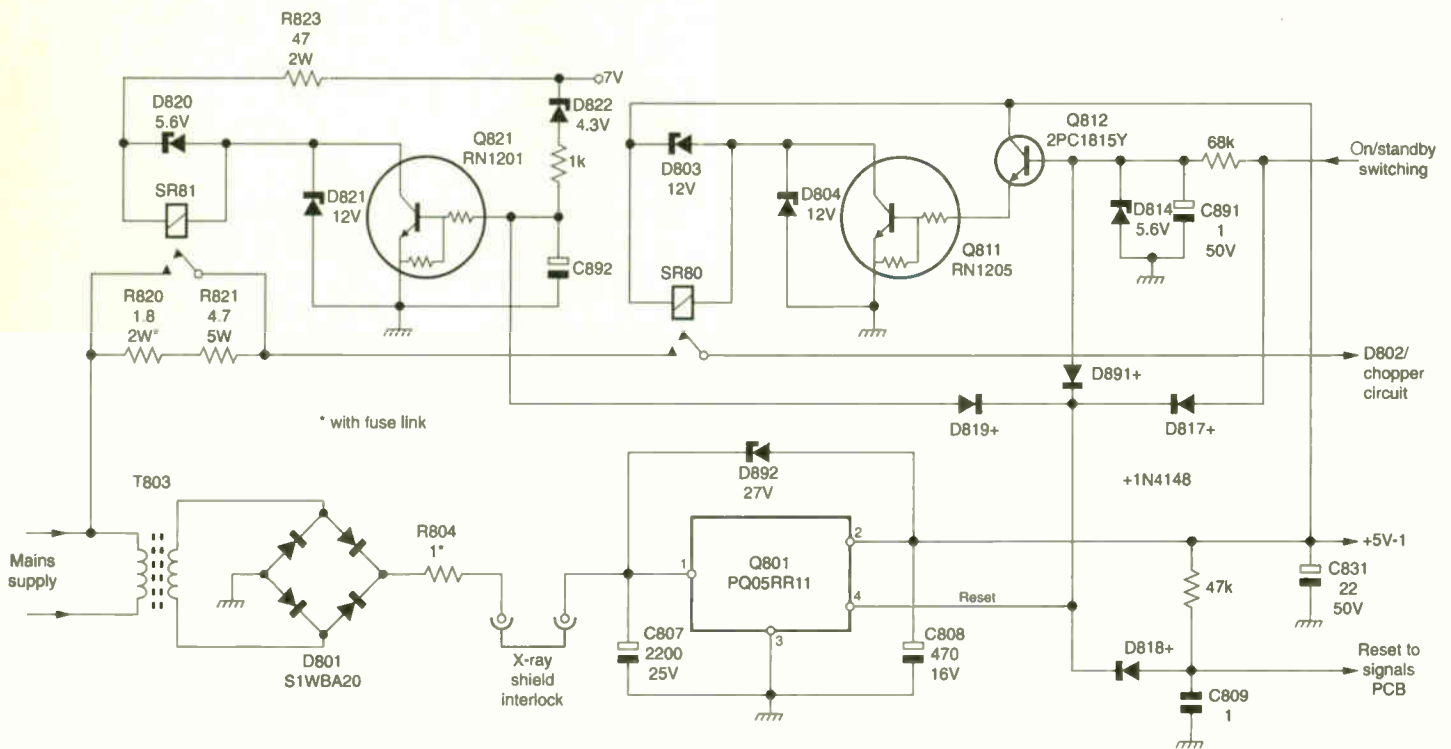


Fig. 1: The standby power supply arrangement in the Toshiba C8SS projection chassis.

by

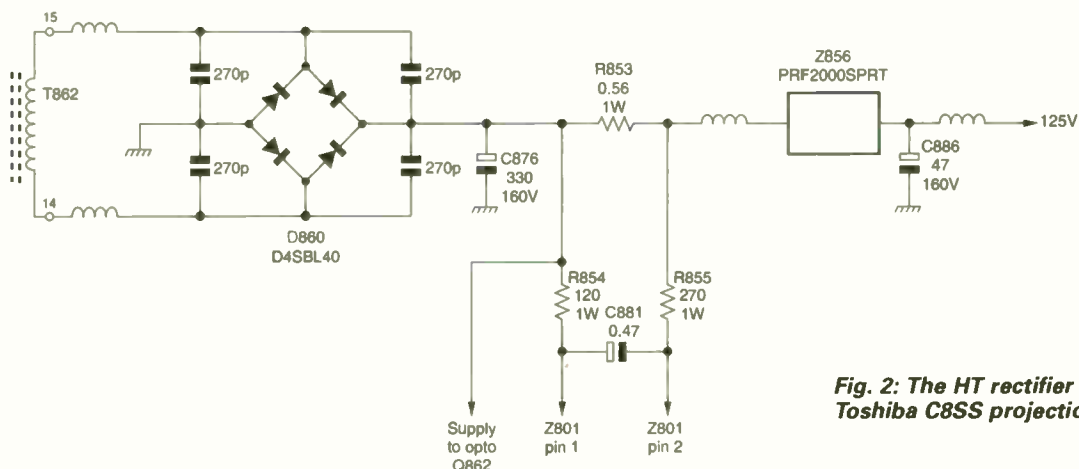


Fig. 2: The HT rectifier circuit in the Toshiba C8SS projection chassis.

Z801. Table 1 shows the voltages that should be present at the pins of Z801.

The convergence board should have 7V, 5V, 36V, +18V and -18V supplies at socket P803. This board also has a socket (P702) that's convenient for monitoring I²C bus data activity.

If there is an intermittent crackle from the loudspeaker, especially when cold, replace the Dolby Digital unit with the new improved version (U2).

Models 48PJ6DB and 55PJ6DB (C5SS chassis)

This chassis employs a somewhat different power supply arrangement. There are two

chopper power supplies. The main one (power supply 1) is on the deflection/power PCB and is switched in by a relay. The other one (power supply 2) is on the convergence output/power 2/audio amplifier board. This one produces the +5V-1 standby supply for the microcontroller IC and the front LED. It should be present at pin 5 of the L78MR05FA regulator chip Q852.

If the picture is completely out of convergence and the LED at the front of the set is flashing green/red, the digital convergence circuitry is not operating. For this to function +18V, -18V and +30V supplies are required. These are provided

power supply 2 and are protected by 2AT fuses, F802, F803 and F804 respectively. A quick check on the fuses will usually reveal that F803 is open-circuit. If a replacement fails, check the convergence module. The flashing LED indicates that the power protection circuit has operated.

The main 125V HT rail, for the line output stage, is produced by power supply 1. It will not be switched on if the +18V and +5V-1 supplies from power supply 2 are missing. As mentioned above, the +18V supply is protected by fuse F802. Q852, which produces the +5V-1 standby supply, receives an 18.6V input at pin 1. This is obtained from D863 (EU2A)/C869

Table 1: Z801 pin functions and voltages, C8SS chassis

Pin	Function, voltage
1	HT voltage monitoring. Should be 125V
2	HT current monitoring. Should be 125V
3	Optocoupler drive for HT regulation. Should be 119V
5	6V from internal reference zener diode
11	25V. Monitors the audio output supply
13	X-ray protection. Normally 22V
14	Protection sensing input. Normally 0V. Any voltage here will trip the set to standby
15	Standby 5V supply. Used by internal latch (trip circuit)
16	Power-on control from microcontroller chip QA01. 5V = on, 0V = standby

(47 μ F, 50V) with protection provided by Z868 (PRF5000).

So if the set is dead with no light from the front LED power supply 2 is not working. The feed to the chopper transformer T863 is via fuse F807 (2AT). If this fuse is open-circuit, check the resistance between the fuse and chassis. If the reading is low, suspect the STR-S6708 chopper chip Q803. Also check the 6-2V zener diode D854.

If there is no centre or surround audio, check the 26.5V supply to ICs Q621 and Q641. This is provided by power supply 2 and is protected by F808 (4AT). Check Q641 and/or Q621 (both type TA8200AH) by replacement if F808 is open-circuit. Should Q621 or Q641 be faulty, check the associated 1N4148 protection diodes D621-6 or D641-6.

The left/right audio output chip Q601 (type LA4282) is on the signals board. A problem you can get here is the right channel noisy with TV and AV inputs, the noise does not vary with the setting of the volume control and eventually the sound is muted. In this event check the muting transistor Q682 (2SC2878A) by replacement.

If the field scan jumps and there is poor convergence, check that the VD waveform is present at pin 20 of P708 on the convergence/power supply 2 panel. Absence of this waveform probably means that Q774 (2SC1815Y) is faulty. If there are convergence errors, check the convergence output ICs Q751 and Q752 (both type STK392-110). If one or the other has overheated or failed, check resistors R7716/7721/7711 and R7726/7731/7736 respectively. These are all 2.2 Ω , 2W resistors.

If the bottom of the picture is blank with bulging on the left-hand side but is OK when the set has warmed up, check the V-stop protection transistor Q350 (2SC1815Y) on the DPC PCB for leakage.

Models 40WH08, 46WH08 and 56WH08 (COOP chassis)

These newer sets use a similar power supply arrangement to the C8SS chassis, with a transformer (T803), bridge rectifier

(D801, type S1WBA20) and a 5V regulator (Q810, type PQ05RR11) to produce the standby 5V-1 supply, and a main chopper circuit that produces a 120V HT supply for the line output stage, also various other outputs. This power supply is based on an STR-Z4369 chopper chip (Q801). There is an extra chopper power supply however that produces an audio 26V supply. This is based on an STR-F6668 chip (Q823). These circuits are all on a separate power PCB.

There's a very good out-of-circuit test for the STR-F6668 chip. Connect 18V (two PP3 batteries in series) between pins 4 and 5, positive to pin 4. Then use a scope, with Y input via a x10 probe, to monitor the waveforms at pins 1, 2 and 3. There should be a 16 μ sec sawtooth waveform with an amplitude of about 0.6V every 66 μ sec at pin 1. At pins 2 and 3 there should be an 8 μ sec square pulse of approximately 7V amplitude every 66 μ sec. These waveforms were illustrated on page 97 in the December 2001 issue of *Television*.

If the set is dead and the LED is out, check the mains input fuse F801 (3-15AT) on the power PCB. Next check for 240V AC at connector P888B. If there is no voltage here, suspect the on/off switch, which can be temporary bypassed as a check by removing the plug from socket P888A on the deflection PCB and inserting it in socket P801A on the power supply PCB. If the voltage is present at P888B, check that the 5V-1 standby supply is present at pin 4 of connector P840B. If not, suspect the 5V regulator Q810 (type PQ05RR11).

If the LED is lit however check for standby/on switching (0/5V) at pin 7 of P840B. If this is incorrect, check the standby switching circuit which is on the signals panel.

The next check if necessary is for 240V AC at the surge limiter resistor R821 (4-7 Ω , 5W). If there is no voltage here, check both surge limiters R821 and R820 (1-8 Ω , 2W fusible) for the open-circuit condition and the operation of relay SR80. If R821 or R820 is open-circuit, check whether the mains bridge

rectifier D802 (LN65860) is short-circuit. There's a kit for this repair. If everything is OK up to this point check for 300V DC at circuit protector Z860 (PRF4000SPRT), which is in the feed between D802 and the main chopper circuit. If this fuse is open-circuit there is clearly a major failure in the chopper circuit: a check between Z860 and the power supply chassis (live) will show whether the chopper chip Q801 is short-circuit.

The next check if necessary is for the presence of the 120V HT supply at circuit protector Z856 (PRF2000SPRT). If there is no voltage here, lift connector BB21A to check whether the cause of the trouble is in the power supply or on the deflection panel.

General information

Safety: Don't attempt to operate one of these sets with the X-ray protection plate at the front removed (it's under the front plastic cover beneath the speaker grill). A safety interlock lead that has to be disconnected to gain access to the CRTs is attached to the plate. When the lead is disconnected the power supply is disabled. Overriding this connector and removing the plate will expose you to harmful X-rays from the CRTs.

Service mode: To enter the service mode, press the mute button on the remote-control unit once, then press and hold it down while pressing the menu button on the TV set. Make sure the remote-control unit is present when you collect a projection set or when one is brought into the workshop.

Screen problems: If the picture is defocused in one spot the cause may be a mark on the screen, or damage that distorts the image. In some cases a complete new screen may be required. A change in colours on the screen can be caused by an electronic fault or dirt on the screen – general dust or cigarette smoke. Odd displays can be caused by dust etc. A good clean will usually restore normal pictures. ■

Grandata Ltd

distributor of electronic components

Television Repair / Mod Kits

MAKE & MODEL	KIT TYPE	CODE
ALBA		
1452T	PSU	ONWAKIT
1427T	PSU	ONWAKIT
1402	PSU	ONWAKIT
1455T	PSU	ONWAKIT
1456T	PSU	ONWAKIT
1458T	PSU	ONWAKIT
1459T	PSU	ONWAKIT
1499Y	STANDBY	MODKIT37
14SLTX	STANDBY	MODKIT37
1799Y	STANDBY	MODKIT37
2002	PSU	ONWAKIT
2009B	PSU	ONWAKIT
2052T	PSU	ONWAKIT
2152T	PSU	ONWAKIT
2099TX	STANDBY	MODKIT37
BTV17	STANDBY	MODKIT37
CTV501	PSU	ONWAKIT
CTV701	PSU	ONWAKIT
CTV840	PSU	ONWAKIT
CTV841	PSU	ONWAKIT
CTV485	PSU	ONWAKIT
AKAI		
CT1417	PSU	ONWAKIT
CT2159U	PSU	ONWAKIT
CT2162UNT	PSU	ONWAKIT
CT2863UNT	PSU	ONWAKIT
DECCA/TATUNG		
F SERIES	PSU	MODKIT30
TVC563	STANDBY	MODKIT37
GOLDSTAR		
CF25A50F	FRAME	MODKIT36
CF25C22C	FRAME	MODKIT35
CF28A50F	FRAME	MODKIT36
CF28C22F	FRAME	MODKIT35
CF28C28F	FRAME	MODKIT36
CF29C42F	FRAME	MODKIT35
GOODMANS		
147TT	PSU	ONWAKIT
149T	PSU	ONWAKIT
1430RA	PSU	ONWAKIT
1430RS	PSU	ONWAKIT
1430RW	PSU	ONWAKIT
1450T	PSU	ONWAKIT
1455TS	PSU	ONWAKIT
2019R	PSU	ONWAKIT
2029T	PSU	ONWAKIT
2029TA	PSU	ONWAKIT
COMPACT 11	PSU	MODKIT47
F16 CHASSIS	FRAME	GOODKIT1
F16 CHASSIS	LINE	GOODKIT1

MAKE & MODEL	KIT TYPE	CODE
GOODMANS..continued		
F16	PSU	GOODKIT1
F16	VIDEO	GOODKIT1
GRUNDIG		
CUC 2050	PSU	MODKIT48
CUC 2051	PSU	MODKIT48
CUC 2058	PSU	MODKIT48
CUC 2059	PSU	MODKIT48
CUC 2080	PSU	MODKIT48
CUC 7350		GRUNDIGKIT1
CUC 7301/3		
(BUZ90)	PSU	GRUNDIGKIT2
CUC 7301/3		
(MJF18004)	PSU	GRUNDIGKIT3
HINARI		
HIT14RC	PSU	ONWAKIT
JVC		
AV29SX1EK	FIELD O/P	JVCKIT1
AV29SX1EN	FIELD O/P	JVCKIT1
AV29SX1EN1	FIELD O/P	JVCKIT1
AV29SX1PF	FIELD O/P	JVCKIT1
AV29TSIE1	FIELD O/P	JVCKIT1
C14E1EK	PSU	ONWAKIT
C14T1EK	PSU	ONWAKIT
C21ET1EK	PSU	ONWAKIT
CS21M3EK	PSU	ONWAKIT
MATSUI		
1455	PSU	ONWAKIT
1496R/T (H3N90)	PSU	MODKIT43
1496R/T (BUZ90)	PSU	MODKIT44
1498	PSU	ONWAKIT
2086	PSU	ONWAKIT
2096R/T (H3N90)	PSU	MODKIT43
2096R/T (BUZ90)	PSU	MODKIT44
2098	PSU	ONWAKIT
21V1N (BUZ90)	PSU	GRUNDIGKIT2
21V1T (MJF18004)	PSU	GRUNDIGKIT3
TVR180R/208	STANDBY	MODKIT37
TVR185T	STANDBY	MODKIT39
mitsubishi		
AV1 SERIES	PSU	MITSKIT3
CT1M5B	PSU	MITSKIT3
CT21M5BT	PSU	MITSKIT3
CT25M5BT	PSU	MITSKIT3
CT21A2STX	TDA 8178S	MITSKIT1
CT21AX1B	PSU	MITSKIT3
CT21A3STX	TDA 8178S	MITSKIT1
CT21AV1BS	PSU	MITSKIT3
CT25A2STX	TDA 8178S	MITSKIT1
CT25A3STX	TDA 8178S	MITSKIT1

MAKE & MODEL	KIT TYPE	CODE
mitsubishi..continued		
CT25A4STX	TDA 8178S	MITSKIT1
CT25A6STX	TDA 8178S	MITSKIT1
CT25AV1B	PSU	MITSKIT3
CT25AV1BS	PSU	MITSKIT3
CT25AV1BD	PSU	MITSKIT3
CT25AV1BDS	PSU	MITSKIT3
CT28AV1B	PSU	MITSKIT3
CT28AX1BD	PSU	MITSKIT3
CT28AV1BDS	PSU	MITSKIT3
CT29AS1	TDA 8178S	MITSKIT2
CT29A4	TDA 8178S	MITSKIT2
CT29A6	TDA 8178S	MITSKIT2
CT29B2	TDA 8178S	MITSKIT2
CT29B3	TDA 8178S	MITSKIT2
CT29B6	TDA 8178S	MITSKIT2
CT33B3	TDA 8178S	MITSKIT2
M5 SERIES	PSU	MITSKIT3
NE/NIKKAI		
CE25 CHASSIS	PSU	NIKKAIKIT1
C289FTXN	PSU	NIKKAIKIT1
C28F41FXN	PSU	NIKKAIKIT1
PANASONIC		
IC561	TDA 8175	PANKIT1
TX25XD60	VERT OUTPUT	PANKIT2
TC28XD60	VERT OUTPUT	PANKIT2
TX28XD70	VERT OUTPUT	PANKIT2
TX29XD70	VERT OUTPUT	PANKIT2
TX-W26D3	VERT OUTPUT	PANKIT2
PHILIPS		
310.10708		PHILKIT3
310.20491		PHILKIT2
310.20496		PHILKIT10
310.31994		PHILKIT6
310.32252		PHILKIT5
310.32253		PHILKIT4
310.32254		PHILKIT9
310.32255		PHILKIT7
310.32262		PHILKIT8
310.62264		PHILKIT1
ANUBIS A	SOPS	PHILKIT2
CP110 CHASSIS	SOPS	PHILKIT8
G90A CHASSIS	SOPS	PHILKIT10
G90B CHASSIS	SOPS	PHILKIT10
G110 CHASSIS	SOPS	PHILKIT3
GR2.1 CHASSIS	SOPS	PHILKIT1
GR2.2 CHASSIS	SOPS	PHILKIT1
D-16 CHASSIS	SOPS	PHILKIT6
HSM VIDEO	SOPS	PHILKIT5
JSM VIDEO	SOPS	PHILKIT4
KSM VIDEO	SOPS	PHILKIT9
LSM VIDEO	SOPS	PHILKIT7

MAKE & MODEL	KIT TYPE	CODE
SAMSUNG		
CI5944	FRAME	SAMKIT2
CI6844	FRAME	SAMKIT2
VIK310	PSU	SAMSUNGKIT
VIK320	PSU	SAMSUNGKIT
VIK350	PSU	SAMSUNGKIT
VI375	PSU	SAMSUNGKIT
VI395	PSU	SAMSUNGKIT
WINNER 1	PSU	SAMSUNGKIT
SHARP		
51CS03H	PSU	SHARPKIT1
51CS05H	PSU	SHARPKIT1
56FW53H	PSU & DOLBY	MODKIT45
59CS03H	PSU	SHARPKIT2
59CS05H	PSU	SHARPKIT2
59CS08H	PSU	SHARPKIT2
59DS03H	PSU	SHARPKIT3
59FW53H	PSU & EW	MODKIT49
66CS03H	PSU	SHARPKIT2
66CS05H	PSU	SHARPKIT2
66CS08H	PSU	SHARPKIT2
66FW53H	PSU & DOLBY	MODKIT45
66FW53H	PSU & EW	MODKIT49
66FW54H	PSU & EW	MODKIT49
76FW53H	PSU & DOLBY	MODKIT45
76FW53H	PSU & EW	MODKIT49
76FW54H	PSU & DOLBY	MODKIT45
76FW54H	PSU & EW	MODKIT49
DA-100 CHASSIS	PSU & EW	MODKIT49
SONY		
SLV715HB	VCR - PSU	MODKIT40
SLV777UB	VCR - PSU	MODKIT40
THOMSON		
35029400		THOMKIT2
35065920		THORNKIT1
FV70	PSU	THORNKIT1
ICC7 CHASSIS	TDA 8178FS	THOMKIT1
ICC7 CHASSIS	FRAME	THOMKIT3
ICC8 CHASSIS	TDA 8178FS	THOMKIT1
ICC8 CHASSIS	FRAME	THOMKIT3
ICC9 CHASSIS	EAST/WEST	THOMKIT4
ICC17 CHASSIS	PSU	MODKIT41
ISS20 (TV-DVD)	PSU	MODKIT46
R3000	PSU	THOMKIT2
R4000	PSU	THOMKIT2
TX92F CHASSIS	EAST/WEST	THOMKIT4

ORDER CODE	PRICE
GOODKIT1	£ 11.00
GRUNDIGKIT1	£ 10.50
GRUNDIGKIT2	£ 10.50
GRUNDIGKIT3	£ 10.50
JVCKIT1	£ 11.00
MITSKIT1	£ 3.00
MITSKIT2	£ 15.00
MITSKIT3	£ 6.00
MODKIT30	£ 10.00

ORDER CODE	PRICE
MODKIT35	£ 9.50
MODKIT36	£ 5.00
MODKIT37	£ 6.50
MODKIT39	£ 8.50
MODKIT40	£ 6.00
MODKIT41	£ 6.00
MODKIT43	£ 7.00
MODKIT44	£ 7.00
MODKIT45	£ 4.00

ORDER CODE	PRICE
MODKIT46	£ 12.00
MODKIT47	£ 15.50
MODKIT48	£ 8.00
MODKIT49	£ 13.00
NIKKAIKIT1	£ 12.00
ONWAKIT	£ 12.00
PANKIT1	£ 15.00
PANKIT2	£ 9.00
PHILKIT1	£ 10.00

ORDER CODE	PRICE
PHILKIT2	£ 2.50
PHILKIT3	£ 4.00
PHILKIT4	£ 4.25
PHILKIT5	£ 5.75
PHILKIT6	£ 5.50
PHILKIT7	£ 7.60
PHILKIT8	£ 4.25
PHILKIT9	£ 7.50
PHILKIT10	£ 8.50

ORDER CODE	PRICE
SAMKIT2	£ 8.00
SAMSUNGKIT	£ 16.00
SHARPKIT1	£ 11.00
SHARPKIT2	£ 11.00
SHARPKIT3	£ 9.00
THOMKIT1	£ 7.00
THOMKIT2	£ 12.00
THOMKIT3	£ 9.00
THOMKIT4	£ 4.00

New Arrival !!

Philips L01.1E Chassis PSU Repair Kit

Fits the following models :

28PT4457/05 , 28PW5407/05 , 28PW6006/05

Order Code : MODKIT50

Price : £ 18.00 + vat

New Arrival !!

Vestel 11AK31 Chassis PSU Repair Kit

Fits the following brands :

Bush , Goodman , Hitachi , Toshiba
Models BD2851S , BD2951S , BD2581S, BD3251S

Order Code : MODKIT51

Price : £ 10.00 + vat

K.P. House , Unit 15 , Pop In Commercial Centre , Southway , Wembley , Middlesex . HA9 0HB England

Tel: (020) 8900 2329

Fax : (020) 8903 6126

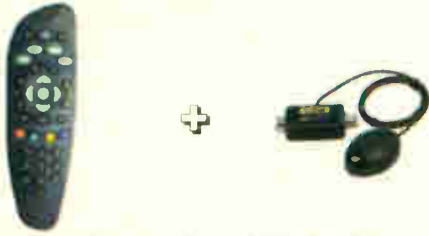
Email : sales@ggrandata.co.uk

Grandata Ltd

distributor of electronic components

Digital Satellite Accessories

Sky™ Digital Remote & TV Link Eye Combination



Order Code : SKYPACK1

Price : £ 16.00 + vat each

5 +

£ 14.50 + vat each

Carriage Charged at £ 5.00 + vat

Sky™ Digital Remote Controls



Order Code : RCSKY

Price £ 7.95 + vat

5 or more £ 7.45 + vat each

10 + £ 6.95 + vat each

Carriage Charged at £ 5.00 + vat

Sky™ Digital Remote & SLx Link Eye Combination



Order Code : SKYPACK2

Price £ 13.00 + vat each

5 + £ 11.50 + vat each

Carriage Charged at £ 5.00 + vat

SLx Link Eye

Allows control of Sky™ Digibox via the signal feed for second TV



**Order Code
27833R**

£ 5.80 + vat each

10 or more

£ 4.80 + vat each

Sky™ Digital TV Link Eye

Order Code : TVLINKEYE

**Price
£ 10.00 + vat**

5 +

**£ 7.99 + vat
each**



SLx Amp By Pass Kit

For use with aerial amplifiers and Sky™ Digibox

Allows for operation of Link Eye in conjunction with a distribution amplifier



Order Code 27829R

Price: £ 5.00 + vat

Satellite Repair / Mod Kits

Amstrad DRX100

Tuner Repair Kit

**Order Code
SATKIT35**

**Price
£ 1.40 + vat**

Amstrad DRX100

PSU Reliability Kit

**Order Code
SATKIT36**

**Price
£ 12.00 + vat**

Amstrad DRX100

PSU Repair Kit

**Order Code
SATKIT37**

**Price
£ 13.50 + vat**

Grundig GDS200

Digital Satellite Receiver Repair Kit

Early psu
MODEL : DSO - 0385 REV C

**Order Code
SATKIT34A**

Price : £ 10.00 + vat

Grundig

GDS200 / GDS300

Digital Satellite Receiver Repair Kit

LATER psu TYPE REV 03
DSO - 0375 REV A DSO - 0385 REV 5

**Order Code
SATKIT34B**

Price : £ 10.00 + vat

Digital Satellite Receivers Fan Kit

Suitable for

Amstrad DRX100 , DRX200
Grundig GDR200 , GDS200
Pace Digibox

plus many more analogue makes and models

Order Code : FANKIT1

Price : £ 10.00 + vat

Panasonic Digital Satellite Receiver Fan Kit

Suitable for Panasonic TU-DSB20/30 , TU-DSB31/35

Order Code : FANKIT2

Price : £ 15.00 + vat

Grundig Digital Satellite Receivers Reliability Kit

These kits contain capacitors that are generally of higher specification than those fitted by the manufacturers.

GDS200

Early PSU
DSO0385 Rev C

Kit Contains 9 capacitors

Code : RELKIT34A

Price: £ 4.00 + vat

GDS200 / GDS300

Later PSU
DSO0375 Rev A
DSO0385 Rev F

Kit Contains 11 capacitors

Code : RELKIT34B

Price: £ 4.00 + vat

GDS200 / GDS300

Later PSU
Rev 03

Kit Contains 13 capacitors

Code : RELKIT34C

Price: £ 4.00 + vat

GDS200 / GDS300

Samsung PSU
PSSH370601B

Kit Contains 12 capacitors

Code : RELKIT34D Price: £ 4.00 + vat

GDS300

Samsung PSU
PSSH370603B

Kit Contains 13 capacitors

Code : RELKIT34E Price: £ 4.00 + vat

105°C Electrolytic Capacitors

VALUE	CODE	PRICE PER PACK
6.3 Volts		
220uF	CAP163	£0.70
470uF	CAP164	£0.80
10 Volts		
100uF	CAP118	£0.45
220uF	CAP165	£1.00
470uF	CAP29	£1.20
680uF	CAP166	£1.20
1000uF	CAP119	£1.50
2200uF	CAP120	£2.10
3300uF	CAP167	£1.60
10 Volts		
22uF	CAP121	£0.35
33uF	CAP122	£0.35
47uF	CAP123	£0.35
100uF	CAP124	£0.60
150uF	CAP168	£0.65
220uF	CAP125	£0.80
330uF	CAP30	£1.75
470uF	CAP31	£1.75
680uF	CAP32	£2.10
1000uF	CAP33	£2.10
1200uF	CAP169	£1.50
1500uF	CAP170	£1.50
2200uF	CAP34	£5.25
3300uF	CAP35	£5.00
4700uF	CAP36	£6.10
6800uF	CAP171	£4.50
25 Volts		
10uF	CAP37	£0.45
15uF	CAP172	£0.45
22uF	CAP38	£0.45
33uF	CAP126	£0.40
47uF	CAP39	£0.48
68uF	CAP127	£0.55
100uF	CAP40	£0.70
120uF	CAP128	£0.85
150uF	CAP41	£0.95
220uF	CAP42	£1.20
330uF	CAP43	£1.40
470uF	CAP44	£1.90
680uF	CAP45	£3.15

VALUE	CODE	PRICE PER PACK
25 Volts...continued		
1000uF	CAP46	£3.65
1500uF	CAP47	£3.90
2200uF	CAP48	£2.00
3300uF	CAP49	£2.20
4700uF	CAP50	£3.65
6800uF	CAP51	£3.90
35 Volts		
1uF	CAP130	£0.40
3.3uF	CAP131	£0.40
4.7uF	CAP132	£0.45
10uF	CAP52	£0.50
22uF	CAP53	£0.45
33uF	CAP54	£0.50
47uF	CAP55	£0.85
68uF	CAP133	£0.55
100uF	CAP56	£0.85
150uF	CAP57	£0.95
220uF	CAP58	£1.45
330uF	CAP134	£1.60
470uF	CAP135	£1.75
680uF	CAP59	£6.50
1000uF	CAP60	£4.35
1500uF	CAP173	£4.00
2200uF	CAP61	£2.45
3300uF	CAP62	£10.00
4700uF	CAP136	£3.50
40 Volts		
2200uF	CAP174	£1.80
2200uF	CAP175	£2.00
50 Volts		
0.47uF	CAP176	£0.35
1uF	CAP137	£0.35
2.2uF	CAP138	£0.35
3.3uF	CAP139	£0.35
4.7uF	CAP140	£0.35
6.8uF	CAP177	£0.45
10uF	CAP63	£0.50
22uF	CAP64	£0.70
33uF	CAP141	£0.85
47uF	CAP65	£0.85
68uF	CAP142	£0.90

VALUE	CODE	PRICE PER PACK
50 Volts...continued		
100uF	CAP66	£0.85
220uF	CAP67	£1.75
330uF	CAP68	£2.45
470uF	CAP69	£4.35
680uF	CAP70	£4.90
1000uF	CAP71	£5.25
1500uF	CAP143	£4.50
2200uF	CAP72	£3.25
3300uF	CAP144	£3.25
63 Volts		
0.22uF	CAP145	£0.45
0.33uF	CAP178	£0.35
0.47uF	CAP73	£0.35
1uF	CAP74	£0.35
1.5uF	CAP179	£0.35
2.2uF	CAP75	£0.35
3.3uF	CAP76	£0.50
4.7uF	CAP77	£0.35
6.8uF	CAP180	£0.50
10uF	CAP78	£0.50
15uF	CAP79	£0.95
22uF	CAP80	£0.75
33uF	CAP81	£0.85
47uF	CAP82	£0.95
56uF	CAP181	£1.10
68uF	CAP83	£1.30
100uF	CAP84	£1.20
150uF	CAP85	£2.80
220uF	CAP86	£2.80
330uF	CAP87	£4.00
470uF	CAP88	£5.25
680uF	CAP89	£5.00
1000uF	CAP90	£5.40
2200uF	CAP182	£2.20
4700uF	CAP183	£4.00
100 Volts		
0.1uF	CAP184	£0.80
0.22uF	CAP185	£0.80
0.33uF	CAP186	£0.80
0.47uF	CAP91	£0.50
1uF	CAP92	£0.85
1.5uF	CAP93	£0.70

VALUE	CODE	PRICE PER PACK
100 Volts...continued		
2.2uF	CAP94	£0.50
3.3uF	CAP95	£0.50
4.7uF	CAP96	£0.50
6.8uF	CAP187	£0.80
10uF	CAP97	£0.95
22uF	CAP98	£1.05
33uF	CAP99	£1.55
47uF	CAP100	£1.75
68uF	CAP188	£1.30
100uF	CAP101	£2.10
220uF	CAP102	£6.00
330uF	CAP189	£3.00
470uF	CAP103	£6.00
680uF	CAP190	£3.00
1000uF	CAP191	£3.00
150 Volts		
0.47uF	CAP192	£0.45
1uF	CAP193	£0.45
2.2uF	CAP146	£0.45
3.3uF	CAP194	£1.00
4.7uF	CAP195	£1.00
10uF	CAP147	£1.40
22uF	CAP148	£1.80
33uF	CAP149	£2.30
47uF	CAP196	£2.20
100uF	CAP150	£3.25
220uF	CAP197	£3.00
470uF	CAP198	£3.25
200 Volts		
22uF	CAP199	£1.60
100uF	CAP151	£3.25
220uF	CAP200	£2.50
330uF	CAP201	£2.50
250 Volts		
0.47uF	CAP202	£0.60
1uF	CAP152	£0.60
2.2uF	CAP203	£1.30
3.3uF	CAP104	£1.75
4.7uF	CAP204	£2.00
10uF	CAP105	£2.60
22uF	CAP153	£2.30

VALUE	CODE	PRICE PER PACK
250 Volts...continued		
33uF	CAP206	£1.75
47uF	CAP106	£4.35
100uF	CAP154	£4.50
220uF	CAP155	£2.00
330uF	CAP206	£2.50
350 Volts		
1uF	CAP156	£1.70
2.2uF	CAP207	£1.20
3.3uF	CAP157	£1.50
4.7uF	CAP208	£1.10
10uF	CAP158	£2.25
22uF	CAP159	£3.40
33uF	CAP209	£2.60
47uF	CAP210	£1.50
100uF	CAP211	£3.00
330uF	CAP212	£5.00
400 Volts		
0.47uF	CAP213	£0.60
1uF	CAP107	£2.15
2.2uF	CAP108	£2.25
3.3uF	CAP214	£2.25
4.7uF	CAP109	£3.15
10uF	CAP110	£4.00
22uF	CAP111	£2.50
33uF	CAP215	£2.50
47uF	CAP216	£3.50
68uF	CAP112	£3.50
100uF	CAP160	£4.00
150uF	CAP217	£3.20
220uF	CAP161	£7.00
560uF	CAP162	£4.00
450 Volts		
1uF	CAP113	£2.80
2.2uF	CAP114	£3.20
3.3uF	CAP218	£3.20
4.7uF	CAP115	£4.95
10uF	CAP116	£5.50
22uF	CAP219	£4.15
33uF	CAP219	£3.00
47uF	CAP220	£2.00
100uF	CAP221	£3.00

Aerial & Satellite Installation Accessories

SLx Aerial Amplifiers

Now with built in Digital ByPass Operates with Sky™ DigiEye

Class leading noise figure of 4dB or less

6dB signal amplification on all models



Description	Order Code	Price
2 Way - No Bypass	SLX2	£ 8.00 + vat
2 Way - With Bypass	SLX2B	£ 9.25 + vat
4 Way - No Bypass	SLX4	£ 13.00 + vat
4 Way - With Bypass	SLX4B	£ 14.00 + vat
6 Way - No Bypass	SLX6	£ 18.00 + vat
6 Way - With Bypass	SLX6B	£ 19.00 + vat
8 Way - No Bypass	SLX8	£ 18.50 + vat
8 Way - With Bypass	SLX8B	£ 20.00 + vat

SLx Masthead Amplifiers

UHF TV antenna pre amplifier designed for the professional aerial installer

15dB gain masthead amplifier ideal for majority of domestic installations

26dB gain masthead amplifier for longer cable runs (loss of more than 3dB) or if connected to passive splitters

Requires 12V DC power supply via downlead either via dedicated power supply unit or from a distribution amplifier with line powering

15dB Amp Order Code : 27830R
Price : £ 4.30 + vat

26dB Amp Order Code : 27831R
Price : £ 4.50 + vat

SLx Masthead Amp PSU
Order Code : 27832R
Price : £ 5.00 + vat

Postage for 2+ £ 5.00 + vat



Coax Plug Aluminium



Order Code : PLG51
Bag of 10
Price : £ 1.25 + vat

Bag of 100
Price : £ 9.00 + vat

Screw Type Coax Plugs



Order Code : PLG62
Bag of 10
Price : £ 1.60 + vat

Bag of 100
Price : £12.50 + vat

Twist On F Connectors



Order Code : PLG101
Bag of 10
Price : £ 1.00 + vat

Bag of 100
Price : £ 6.00 + vat

SLx Satellite Finder

Allows the user to find the best azimuth / elevation settings for a satellite dish, resulting in the best signal reception / picture and sound quality

Compact design
Backlit meter scale
Audible signal strength reading
Adjustable level control
Adjustable sensitivity adjustment
Frequency Range : 950 - 2250Mhz



Order Code : 27860R **Price : £ 10.00 + vat**

Grandata Ltd

distributor of electronic components

Transistors / Linear IC's

Part No.	Price	Part No.	Price	Part No.	Price	Part No.	Price	Part No.	Price	Part No.	Price	Part No.	Price	Part No.	Price		
BU208A	£0 75	IRF5450	£5 00	MJE350	£0 80	STK4191	£9 00	STK5464	£3 00	STR371	£4 00	TDA2450-3	£10 00	TDA4665	£2 50	TDA8138	£2 00
BU2506DF	£0 90	IRF5740	£3 00	MUF		STK4191 X	£14 00	STK5466	£5 00	STR380	£3 50	TDA2461	£0 70	TDA4670	£4 75	TDA8138A	£1 30
BU2908DX	£1 00	IRF5840	£3 00	MUF16206	£4 50	STK419-130	£15 00	STK5467	£4 00	STR381	£3 90	TDA2501	£3 00	TDA4671	£5 00	TDA8138B	£2 00
BU2508A	£1 00	IRF610	£0 80	MUF18004	£1 75	STK419-140	£16 00	STK5468	£3 00	STR384	£4 10	TDA2506T	£8 00	TDA4680	£3 50	TDA8139	£2 00
BU2508AF	£1 10	IRF611	£1 20	MUF18006	£2 00	STK4192	£7 00	STK5471	£9 00	STR384	£3 50	TDA2507	£4 50	TDA4681	£4 50	TDA8140	£2 00
BU2508AX	£1 10	IRF620	£1 00	MUF18008	£1 75	STK4197 II	£9 50	STK5472	£3 75	STR40090	£3 50	TDA2510	£4 50	TDA4682	£2 75	TDA8143	£1 60
BU2508D	£1 30	IRF630	£0 75	MUF18204	£2 50	STK4198 II	£10 50	STK5473	£4 80	STR40115	£6 00	TDA2514A	£5 00	TDA4686	£5 00	TDA8145	£1 20
BU2508DF	£1 20	IRF634	£1 25	STK0025	£4 20	STK4199II	£10 50	STK5474	£5 00	STR4090A	£6 00	TDA2515	£4 50	TDA4687	£5 00	TDA8146	£2 00
BU2508DX	£1 50	IRF640	£1 50	STK0039	£6 00	STK420	£4 00	STK5476	£3 50	STR41090	£3 30	TDA2520-1	£9 00	TDA4700A	£7 50	TDA8153	£10 00
BU2520AF	£1 70	IRF640F	£2 00	STK086	£10 00	STK420A II	£10 50	STK5477	£4 50	STR4142	£4 50	TDA2521	£8 00	TDA4710H	£7 00	TDA8170	£1 70
BU2520AX	£1 40	IRF630S	£2 00	STK1039	£4 60	STK420AII	£10 50	STK5478	£2 50	STR4211	£3 15	TDA2522	£12 00	TDA4714C	£3 50	TDA8171	£2 30
BU2520DF	£2 25	IRF642	£2 00	STK1040	£6 40	STK4211 II	£10 00	STK5479	£3 00	STR43111	£9 50	TDA2523	£8 50	TDA4716C	£4 50	TDA8172	£2 00
BU2520DX	£2 00	IRF644	£2 00	STK1049	£7 00	STK4211 V	£8 00	STK5481	£4 70	STR440	£8 00	TDA2525	£3 50	TDA4720	£6 60	TDA8173	£1 75
BU2522AX	£1 50	IRF650	£2 00	STK1050	£6 50	STK4221 II	£12 00	STK5482	£2 85	STR441	£9 50	TDA2530	£3 00	TDA4725	£7 50	TDA8174	£2 00
BU2525A	£3 25	IRF710	£1 00	STK1060	£7 00	STK4231 II	£10 50	STK5483	£4 40	STR44115	£4 75	TDA2548	£2 00	TDA4780	£6 00	TDA8175	£7 00
BU2525AF	£2 20	IRF720	£0 85	STK2025	£6 20	STK4231 V	£14 00	STK5486	£4 50	STR442	£16 00	TDA2549	£3 00	TDA4800	£3 00	TDA8177	£3 00
BU2525AX	£1 90	IRF730	£0 90	STK2028	£5 00	STK4241	£10 50	STK5487	£5 25	STR450A	£7 00	TDA2558	£4 00	TDA4810	£5 00	TDA8177F	£3 50
BU2525D	£2 40	IRF740	£0 90	STK2029	£6 00	STK4241 V	£12 50	STK5488	£4 80	STR451	£8 00	TDA2560Q	£7 00	TDA4850	£4 75	TDA8179S	£7 50
BU2525DF	£1 75	IRF740F	£3 00	STK2030	£10 00	STK4272	£5 00	STK5490	£4 50	STR45111	£5 50	TDA2560-3	£14 00	TDA4851	£3 25	TDA8180	£12 50
BU2527AF	£4 00	IRF820	£0 90	STK2038	£7 00	STK4273	£5 50	STK561	£4 00	STR4512	£4 00	TDA2574V	£3 50	TDA4852	£3 25	TDA8205	£12 50
BU2527AX	£2 50	IRF830	£0 85	STK2048	£9 50	STK4274	£5 00	STK583	£4 15	STR452	£4 75	TDA2576A	£9 00	TDA4854	£5 00	TDA8212	£3 50
BU2527DF	£2 00	IRF830F	£1 80	STK2058 IV	£16 00	STK4274	£5 00	STK5632	£4 00	STR453	£5 00	TDA2577A	£2 00	TDA4855	£6 00	TDA8214B	£10 50
BU2527DX	£2 00	IRF840	£0 85	STK2101	£10 50	STK430	£5 00	STK5720	£3 00	STR454	£13 00	TDA2578A	£7 00	TDA4856	£5 00	TDA8215H	£3 50
BU2532AL	£3 25	IRF840F	£1 75	STK2110	£5 50	STK4301	£5 00	STK5725	£3 50	STR455	£5 50	TDA2579A	£2 10	TDA4858	£3 50	TDA8217	£2 25
BU2708AF	£2 00	IRF9140	£10 00	STK2139	£6 75	STK4311	£6 50	STK5730	£3 00	STR456	£4 70	TDA2579B	£3 25	TDA4860	£2 00	TDA8303	£2 50
BU2708AX	£2 00	IRF9230	£4 00	STK2155	£9 00	STK433	£4 00	STK583	£4 00	STR457	£6 00	TDA2652	£48 00	TDA4861	£3 50	TDA8304	£4 00
BU2708DF	£2 00	IRF9510	£1 50	STK2230	£4 70	STK4332	£3 65	STK6316	£3 00	STR470	£3 00	TDA2653A	£4 50	TDA4866	£2 75	TDA8305	£5 00
BU2708DX	£2 00	IRF9511	£1 50	STK3102 II	£5 30	STK435	£3 75	STK6324B	£5 00	STR50020	£3 50	TDA2710-1	£4 00	TDA4880	£4 50	TDA8305A	£5 00
BU2720AX	£2 00	IRF9520	£1 50	STK3106	£25 00	STK4352	£5 00	STK6327	£12 00	STR50092	£5 50	TDA2820M	£1 00	TDA4918A	£17 00	TDA8310	£6 00
BU2720DF	£2 00	IRF9530	£1 25	STK3122 III	£7 25	STK436	£4 30	STK6328A	£4 00	STR50103A	£2 60	TDA2822M	£0 60	TDA4930	£5 00	TDA8350Q	£2 75
BU2720DX	£2 00	IRF9531	£2 00	STK3152 II	£9 00	STK4362	£4 50	STK6431	£6 00	STR50112A	£6 50	TDA4935	£3 00	TDA4935	£3 00	TDA8351	£2 00
BU2722AF	£3 30	IRF9540	£1 75	STK3156	£5 00	STK437	£6 00	STK6607	£4 00	STR50113	£5 00	TDA4940	£2 00	TDA4940	£2 00	TDA8354Q	£2 75
BU2725AF	£2 00	IRF9541	£2 00	STK350-030	£7 00	STK4372	£4 90	STK6712BIV	£5 50	STR50115	£5 00	TDA4941	£2 80	TDA4941	£2 80	TDA8356	£2 00
BU2725DF	£2 00	IRF9610	£0 95	STK392-040	£12 00	STK439	£5 00	STK6722	£6 50	STR50213	£4 00	TDA4942	£2 00	TDA4942	£2 00	TDA8360N3	£8 00
BU2725DF	£2 00	IRF9620	£0 85	STK401-050	£8 00	STK4392	£5 00	STK6732	£10 00	STR50300	£4 75	TDA4950	£3 60	TDA4950	£3 60	TDA8361AN3	£8 00
BU2727AF	£2 00	IRF9622	£2 00	STK401-080	£9 00	STK441	£6 80	STK6822	£7 50	STR51041	£5 00	TDA4951	£3 00	TDA4951	£3 00	TDA8361N3	£9 00
BU2727A	£2 00	IRF9630	£1 30	STK401-120	£10 00	STK4412	£4 50	STK6875	£6 50	STR51213	£5 00	TDA5010	£3 00	TDA5010	£3 00	TDA8362AN	£12 00
BU2727AF	£2 00	IRF9640	£2 30	STK401-140	£12 00	STK443	£7 00	STK6922	£10 00	STR51424	£7 00	TDA5011	£4 50	TDA5011	£4 50	TDA8362AN3	£7 50
BU506DF	£1 00	IRFBC20	£1 10	STK4017	£4 00	STK4432	£6 00	STK6932	£4 50	STR53041	£4 00	TDA5050	£9 00	TDA5050	£9 00	TDA8362B3	£8 50
BU508AF	£0 60	IRFBC30	£1 20	STK4019	£7 80	STK457	£4 70	STK6962	£2 75	STR54041	£3 20	TDA5051	£3 00	TDA5051	£3 00	TDA8362N3	£12 00
BU508APH	£0 60	IRFBC40	£2 10	STK402-040	£7 00	STK459	£5 60	STK6972	£3 00	STR5412	£2 80	TDA5052	£3 00	TDA5052	£3 00	TDA8362N4	£9 00
BU508AXI	£0 90	IRFBC50	£2 25	STK402-070	£7 00	STK460	£6 60	STK6981B	£5 00	STR55041	£4 50	TDA5053	£2 60	TDA5053	£2 60	TDA8362N5	£12 00
BU508D	£0 75	IRFD120	£1 00	STK402-070	£7 00	STK461	£6 00	STK6982	£6 00	STR55041	£4 50	TDA5054	£3 50	TDA5054	£3 50	TDA8362N6	£15 00
BU508DF	£0 85	IRFD9120	£1 20	STK402-071	£7 00	STK463	£9 50	STK6982H	£6 00	STR58041	£2 50	TDA5055	£4 00	TDA5055	£4 00	TDA8363N3	£11 50
BU508DR	£1 00	IRFD9220	£1 00	STK402-090	£8 00	STK465	£9 00	STK7216	£4 20	STR59041	£3 00	TDA5056	£3 25	TDA5056	£3 25	TDA8370	£11 50
BUH1015	£4 25	IRFF120	£3 00	STK4021	£3 80	STK473	£8 20	STK7217	£2 50	STR60001	£5 25	TDA5057	£2 20	TDA5057	£2 20	TDA8372A	£16 50
BUH1215	£4 50	IRFIBC40	£1 00	STK402-100	£9 00	STK4793	£8 00	STK7225	£5 00	STR6000X	£5 75	TDA5058	£2 80	TDA5058	£2 80	TDA8374	£10 00
BUH515	£2 00	IRFIBC40G	£2 00	STK402-100	£9 00	STK4803	£10 00	STK7226	£17 00	STR6020	£2 70	TDA5059	£3 00	TDA5059	£3 00	TDA8375A	£12 50
BUH515D	£2 50	IRFP054	£4 00	STK402-120	£9 00	STK4813	£8 00	STK7233	£7 00	STR61001	£4 75	TDA5060	£3 50	TDA5060	£3 50	TDA8376	£15 00
BUH517	£2 75	IRFP064	£5 00	STK4024 II	£5 50	STK4833	£8 50	STK7251	£5 00	STR7001	£6 00	TDA5061	£3 00	TDA5061	£3 00	TDA8380	£2 00
BUH517D	£1 75	IRFP140	£2 50	STK4025	£5 30	STK4843	£7 20	STK7253	£6 50	STR80145	£4 75	TDA5062	£3 75	TDA5062	£3 75	TDA8412A	£4 00
BUH715	£4 25	IRFP150	£2 40	STK4026	£4 80	STK4853	£17 00	STK7300-060	£6 50	STR81145	£3 75	TDA5063	£7 00	TDA5063	£7 00	TDA8425	£5 00
BUL310	£1 25	IRFP240	£3 00	STK4026II	£4 80	STK4863	£7 00	STK7300-080	£6 00	STR81159	£4 00	TDA5064	£6 75	TDA5064	£6 75	TDA8430	£5 00
BUL381	£1 60	IRFP340	£2 50	STK4026V	£5 00	STK4873	£11 00	STK7308	£7 00	STR8124	£10 00	TDA5065	£2 00	TDA5065	£2 00	TDA8433	£6 00
BUL381D	£1 25	IRFP450	£2 70	STK4032	£5 50	STK4880-10	£9 00	STK7309	£4 00	STR83145	£5 00	TDA5066	£3 50	TDA5066	£3 50	TDA8440	£3 00
BU111A	£0 35	IRFP350	£3 25	STK4032 II	£5 10	STK488 050	£8 00	STK7310	£3 20	STR83159	£7 00	TDA5067	£5 00	TDA5067	£5 00	TDA8443	£3 50
BU111AF	£0 35	IRFP360	£8 00	STK4034 X	£9 25	STK4893	£10 00	STK7310 II	£5 50	STR8420	£8 00	TDA5068	£3 25	TDA5068	£3 25	TDA8451	£3 25
BU111AX	£0 50	IRFP450	£2 70	STK4036	£4 70	STK4913	£9 00	STK7340	£3 50	STR8425	£10 00	TDA5069	£0 80	TDA5069	£0 80	TDA8453	£3 50
BU112	£0 80	IRFP460	£4 00	STK4036V	£8 00	STK501	£5 50	STK7340 II	£5 00	STR8435	£10 00	TDA5070	£3 00	TDA5070	£3 00	TDA8455	£9 50
BU112A	£0 80	IRFP9140	£14 00	STK4038	£6 80	STK50322	£3 50	STK7348	£4 00	STR8441	£10 00	TDA5071	£3 50	TDA5071	£3 50	TDA8461	£9 50
BU112AF	£0 80	IRFP9240	£3 00	STK4040 II	£6 50	STK5314	£4 75	STK7356	£4 25	STR8442	£10 00	TDA5072	£3 00	TDA5072	£3 00	TDA8465	£3 75
BU118	£0 80	IRFPCC40	£3 00	STK4042 II	£8 00	STK5315	£5 00	STK7358	£4 40	STR8443	£10 00	TDA5073	£3 00	TDA5073	£3 00	TDA8466	£5 00
BU118A	£0 80	IRFPCC50	£4 50	STK4046	£9 50	STK5323	£6 00	STK7359	£4 25	STR8444	£10 00	TDA5074	£3 00	TDA5074	£3 00	TDA8467	£5 00
BU118AF	£0 85	IRFP															

Grandata Ltd

distributor of electronic components

Line Output Transformers

Part No	Code	Price	Part No	Code	Price	Part No	Code	Price	Part No	Code	Price	Part No	Code	Price
ALBA			HITACHI..continued			PANASONIC..continued			PHILIPS..continued			THOMSON..continued		
3714002	LOT02	£12.00	2433453	LOT82	£12.50	TLF 14568 F	LOT40	£15.00	AT 2079 / 21	LOT395	£12.00	10588080.P2	LOT1505	£19.00
043714002J	LOT02	£12.00	2433751	LOT01	£13.00	TLF 14584 F	LOT41	£17.00	AT 2079 / 24	LOT392	£15.00	151128140	LOT1505	£19.00
43700000	LOT02	£12.00	2433752	LOT01	£13.00	TLF 14586 F	LOT42	£17.00	AT 2079 / 40	LOT73	£11.50	151281.4	LOT1505	£19.00
AMSTRAD			2433891	LOT23	£12.50	PHILIPS			AT 2079 / 99	LOT276	£14.00	15128140	LOT1505	£19.00
1810951	LOT55	£14.00	2433892	LOT84	£14.50	3119 108 31260	LOT90	£12.50	AT 2079/30 01	LOT106	£12.50	1513144.6	LOT1505	£19.00
3714002	LOT02	£12.00	2433893	LOT23	£12.50	3119 108 31290	LOT73	£11.50	AT 2079/30102	LOT106	£12.50	15314460	LOT1505	£19.00
043714002J	LOT02	£12.00	2433952	LOT33	£10.00	3119 108 31440	LOT433	£16.00	SAISHO			1532873 A	LOT1505	£19.00
43700000	LOT02	£12.00	2434001	LOT226	£14.50	3119 108 31441	LOT433	£16.00	3714002	LOT02	£12.00	3233500	LOT244	£14.50
AM152591	LOT55	£14.00	2434142	LOT33	£10.00	3119 108 31442	LOT433	£16.00	043714002J	LOT02	£12.00	3233900	LOT244	£14.50
FERGUSON			2434393	LOT405	£22.50	3119 198 62930	LOT57	£11.00	43700000	LOT02	£12.00	40011200	LOT244	£14.50
00 D-3-508-002	LOT381	£15.50	2434593	LOT44	£10.50	3122 108 10246	LOT111	£15.00	7140021	LOT02	£12.00	40148300	LOT244	£14.50
06 D-3-083-001	LOT82	£12.50	2435006	LOT401	£17.00	3122 138 36070	LOT111	£15.00	SHARP			TOSHIBA		
06 D-3-083-002	LOT82	£12.50	2435131	LOT251	£14.50	3122 138 36072	LOT111	£15.00	RTRNF 1220 CEZZLOT39	£18.50	1810951	LOT55	£14.00	
06 D-3-084-001	LOT23	£12.50	2436201	LOT90	£12.50	3122 138 36920	LOT57	£11.00	RTRNF 2001 CEZZLOT338	£17.50	2433751	LOT01	£13.00	
06 D-3-087-001	LOT23	£12.50	23236465	LOT392	£15.00	3122 138 36922	LOT57	£11.00	RTRNF 2006 CEZZLOT308	£13.50	23236098	LOT288	£14.00	
06 D-3-088-001	LOT84	£14.50	2433891H	LOT23	£12.50	3122 138 36923	LOT57	£11.00	RTRNF 2023 CEZZLOT310	£15.00	23236198	LOT288	£14.00	
06 D-3-093-001	LOT204	£16.00	45150504	LOT362	£16.00	3122 138 37050	LOT132	£15.00	SONY			23236201	LOT395	£12.00
06 D-3-508-003	LOT276	£14.00	MATSUI			3122 138 37620	LOT90	£12.50	1-439-286-00	LOT46	£13.00	23236245	LOT395	£12.00
06 D-3-512-001	LOT204	£16.00	20070	LOT438	£16.00	3122 138 37771	LOT129	£14.00	1-439-286-11	LOT46	£13.00	23236255	LOT289	£15.00
29201-022-01	LOT63	£17.00	20071	LOT438	£16.00	3122 138 38040	LOT73	£11.50	1-439-286-12	LOT46	£13.00	23236427	LOT395	£12.00
473197	LOT304	£15.50	20072	LOT438	£16.00	3122 138 38123	LOT395	£12.00	1-439-286-13	LOT46	£13.00	23236428	LOT289	£15.00
D 059 / 37	LOT200	£14.00	20073	LOT438	£16.00	3128 138 20200	LOT433	£16.00	1-439-286-21	LOT46	£13.00	23236424	LOT129	£14.00
GOODMANS			20074	LOT438	£16.00	3128 138 20201	LOT433	£16.00	1-439-332-41	LOT100	£15.00	TFB 4090 AD	LOT395	£12.00
1142.5057	LOT1164	£15.00	20075	LOT438	£16.00	3128 138 20202	LOT433	£16.00	1-439-332-42	LOT101	£14.50	TFB 4124 AE	LOT392	£15.00
1142.5077	LOT1164	£15.00	3714002	LOT02	£12.00	3138 108 30100	LOT106	£12.50	1-439-332-52	LOT100	£15.00	TFB 4124 AP	LOT392	£15.00
1142.5079	LOT1164	£15.00	3221008	LOT438	£16.00	3138 108 30101	LOT106	£12.50	1-439-363-11	LOT268	£14.00	<p>We are stockist of both Konig and HR Diemen LOPT's This is just a selection of the LOPT's that we stock....Please call on 020 8900 2329 for copy of our LOPT catalogue</p>		
1142.5081	LOT1164	£15.00	043714002J	LOT02	£12.00	3138 108 30103	LOT106	£12.50	1-439-363-21	LOT268	£14.00			
1152.5016	LOT1934	£19.00	043221088P	LOT438	£16.00	3139 128 30400	LOT90	£12.50	1-439-387-11	LOT311	£14.50			
1179.0387	LOT1147	£16.00	43700000	LOT02	£12.00	40348-08	LOT1577	£18.00	1-439-387-21	LOT311	£14.50			
1192.0527	LOT1147	£16.00	71400021	LOT02	£12.00	40348A-08	LOT1577	£18.00	1-439-416-11	LOT255	£16.00			
1352.5008	LOT1167	£15.00	mitsubishi			4812 140 10246	LOT111	£15.00	1-439-416-12	LOT255	£16.00			
1352.5008E	LOR1934	£19.00	731003	LOT51	£15.50	4812 140 10349	LOT106	£12.50	1-439-416-21	LOT255	£16.00			
1352.5016	LOR1934	£19.00	334 P 18506	LOT51	£15.50	4812 140 10369	LOT90	£12.50	1-439-416-23	LOT255	£16.00			
1352.5027	LOT1270	£16.00	OREGA			4812 140 10421	LOT90	£12.50	1-439-416-41	LOT255	£16.00			
1352.5033	LOT1270	£16.00	40153201	LOT349	£17.50	4822 140 10246	LOT111	£15.00	1-439-416-51	LOT255	£16.00			
HINARI			ORION			4822 140 10274	LOT123	£14.50	THOMSON					
3714002	LOT02	£12.00	3714002	LOT02	£12.00	4822 140 10306	LOT57	£11.00	105009.8	LOT1505	£19.00			
043714002J	LOT02	£12.00	043714002J	LOT02	£12.00	4822 140 10349	LOT106	£12.50	10500980	LOT1505	£19.00			
43700000	LOT02	£12.00	43700000	LOT02	£12.00	4822 140 10381	LOT128	£13.00	10500980.P1	LOT1505	£19.00			
CF 124 B	LOT67	£14.50	PANASONIC			4822 140 10384	LOT127	£15.50	10531460	LOT1505	£19.00			
CF 124 E	LOT67	£14.50	TLF 14512 F	LOT39	£18.50	4822 140 10406	LOT73	£11.50	105660.6	LOT1505	£19.00			
HITACHI			TLF 14520 F	LOT40	£15.00	4822 140 10544	LOT433	£16.00	105660060	LOT1505	£19.00			
2424593	LOT44	£10.50	TLF 14521 F	LOT39	£18.50	4822 140 10566	LOT433	£16.00	10566060	LOT1505	£19.00			
2432461	LOT169	£15.00	TLF 14567 F	LOT39	£18.50	AT 2076 / 10	LOT57	£11.00	10566060.P2	LOT1505	£19.00			
2432761	LOT169	£15.00	PHILIPS			AT 2077 / 81	LOT121	£15.00	105880.8	LOT1505	£19.00			
						AT 2078 / 21	LOT395	£12.00	10588080	LOT1505	£19.00			
						AT 2079 / 15	LOT129	£14.00						

CD Pick Ups and Mechanisms

Part No	Price	Part No	Price	Part No	Price
CDM12.1 Mechanism	£14.00	KSS 213 B	£8.75	OPTIMA 6 S	£11.50
KHM220AAA		KSS 213 C	£9.50	OPTIMA 5	£11.50
DVD Laser	£ 40.00	KSS 213 D	£16.00	RCTRTH8151	£20.00
KSS 210A Original	£11.00	KSS 213 F	£12.00	RCTRTH8112	£14.00
KSS 210A Replacement	£9.50	KSS 240 A	£30.00	RCTRTH8147 Mech	£ 10.00
KSS 210 B	£15.00	NKS 240 A			
		Replacment for KSS240A	£20.00		

Check out our Online Catalogue at
www.grandata.co.uk

This advertisement is just a selection of our stock.

Please contact us if you cannot find the part you are looking for.

* Please add £1 p+p and VAT to all orders (Unless Otherwise stated) * All components are brand new

* We accept payment by Access , Switch , Visa , Cheque and Postal Order

* All prices quoted are subject to availability and may be changed without prior notice

E & OE

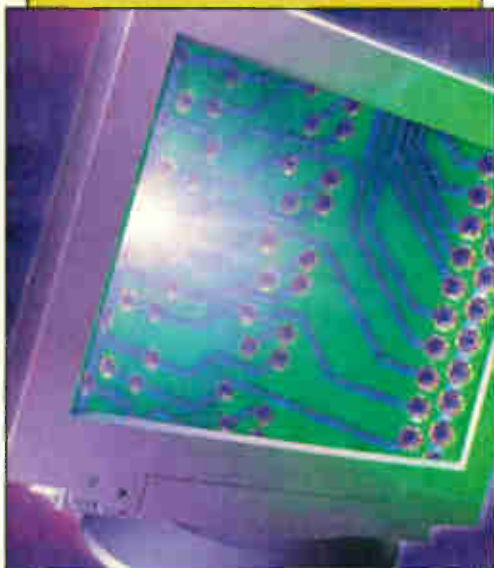
K.P. House , Unit 15 , Pop In Commercial Centre , Southway , Wembley , Middlesex . HA9 0HB England

Tel : (020) 8900 2329

Email : sales@grandata.co.uk

Fax : (020) 8903 6126

Website : www.grandata.co.uk



MONITORS

Fault reports from
Bob Bradley
 and
Gerry Mumford

We welcome fault reports from readers – payment for each fault is made after publication.

Reports can be sent by post to:

Television Magazine Fault Reports,
 Highbury Business,
 Media House,
 Azalea Drive, Swanley,
 Kent BR8 8HU

or e-mailed to:
t.winford@highburybiz.com

NEC LCD 1525-BK

Most of the problems I've had with these 15in. TFT flat-screen monitors have been caused by the inverter board, NEC part no. 79PL0955. It provides DC-AC 12V to power the cold-cathode fluorescent lamps, NEC part no. 79PU0380, at the top and bottom of the LCD screen. They illuminate it by providing a backlight. Without this the display is dull and unreadable.

To gain access to the inverter board, start by removing the stand and back cover. Once inside, remove the twelve screws that retain the metal screening plate. When this has been lifted away you should see three PCBs. The inverter board is the long one on the left-hand side. The interface board is at the centre, and the audio board on the right-hand side.

There are two identical circuits on the inverter board. They power the top and bottom lamps independently. One or the other circuit or both can fail, causing a variety of symptoms – dull at the top of the screen, dull at the bottom or dull all over.

It's common to find that one or the other or both of the two 1.5A Pico fuses in the centre of the board have blown. This is usually associated with failure of zener diode ZD1 and/or zener diode ZD3. Diodes D3 and/or D4 (General Semiconductors type SS14) can also fail. Most of the components on the board are of the surface-mounted type. As a guide, you should be able to read approximately 5.5V across zener diodes ZD1 and ZD3 if they and their associated circuitry are operating correctly.

It's also worth checking the two high-voltage disc ceramic capacitors at each end of the PCB. They have a tendency to burn. Replace as necessary with the same type of capacitor. B.B.

NEC LCD 400

Two models come under the guise of LCD 400. The one that's the subject of this fault report is Model 141 LHS-1, which is a 14in. TFT flat-screen monitor. On the whole it's very reliable, the usual complaint being about a general degradation of the picture/display quality. The cause is ageing – these monitors were manufactured in 1999. Unlike a monitor with a CRT, where the cause could be a low-emission tube, in this case the cause is the backlights that are fitted at the top and bottom of the LCD panel.

When you inspect the lampholder assemblies you will see that in addition to the cold-cathode fluorescent lamps ageing (blackened at the ends) the lampholders themselves add to the poor light output: their silvered coating peels away from the gold-

coloured backing and curls over the lamp, impeding the light output. The solution is to replace both lamp assemblies, which are supplied as a pair (NEC part no. 79N0003). The upper lampholder carries the letter A while the lower one has letter B.

It's fairly easy to dismantle the unit. Lay the monitor down on its face and remove the base/stand assembly that houses the power supply, then the back cover. This reveals a metal screening plate, to which the interface PCB is attached – it's not necessary to remove this PCB. A number of screws around the screening plate fix it to the cabinet front. Remove these screws and lift the screening plate off. Take great care when you do this, as a ribbon cable that connects the interface PCB to a PCB mounted on the display panel below the plate is still attached at this stage, and a lot of damage can be done if care is not taken. My advice is to lift the left-hand edge of the metal plate gently and slide your hand in to pinch together the clips that hold the ribbon plug and socket together. Having done this, remove the other two connectors that are alongside. The screening plate can then be lifted clear, exposing the LCD display panel.

Replacement of the lamp units is as follows. Unfasten the clamp that retains the lamp cables, then disconnect the cable sockets from the connectors on the inverter board. Lift part A's black-plastic retaining clip then, holding the lamp cables, gently withdraw the lampholder by sliding it out. Repeat for part B. Fit the new lamps, then reassemble the monitor in the reverse order.

At power up go into the settings screen and do a factory default to normalise all previous settings. You should then have a display that's almost as good as new. B.B.

Elonex M557 (MN015COM)

The symptoms with this 15in. monitor were EW bowing and excessive width. A quick inspection revealed that one of the EW modulator diodes, D830 (ER306), had overheated and looked quite scorched. It read leaky at 70Ω. A new diode cured the fault.

The diode is mounted vertically at the rear of the chassis and, oddly, one end is soldered to the line output transistor's heatsink. G.M.

Tiny M-M7F22TY (Panasonic MHV15W chassis)

This monitor produced a display with EW bowing and excessive width. Checks in the line output stage showed that EW modulator diode D552 (type RG2A) had a 5Ω leak. Replacement of this diode restored correct width and straight edges. G.M.

Digital audio image restoration

K. Rutherford describes a recently-developed technology that enables the optical sound tracks on films from the Golden Age to be preserved

Over the past three years Technicolor Creative Services has developed a digital audio image restoration technology that enables the sound on films from the Golden Age to be preserved. It's a new approach to the reproduction and restoration of old optical sound tracks, and has been given the name AIR (Audio Image Restoration). The optical track is treated more as a photographic image than an audio recording. This enables the image to be digitally processed to compensate for image-spread distortion, spurious artefacts and hiss.

Hollywood's Golden Age lasted from about 1930 until the early 1950s, during which period the majority of films were provided with a monophonic, optically-recorded sound track. Unless these films have been carefully stored, they will have decayed with time and suffered from the effects of use. The optical track will have been scratched and will have faded, and will also have picked up dirt. The optical sound track is placed inside the sprocket holes alongside the picture frames, and is approximately a tenth of an inch (2.5mm) wide. Fig. 1 shows the arrangement.

Fig 1: Position of the optical sound track on a 35mm movie film.

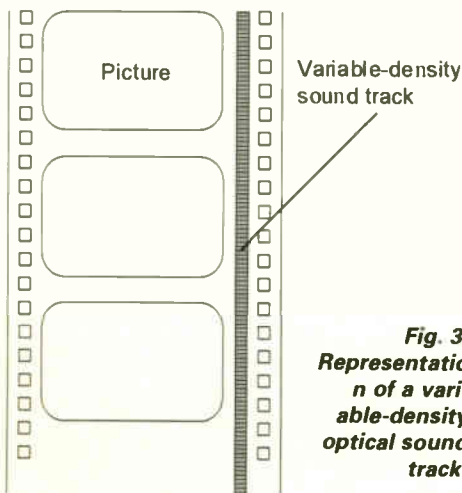


Fig. 3: Representation of a variable-density optical sound track.

Golden Age Technology

Originally two types of recording were used. One system modulated the output from a lamp called an Aeolight. This was a gas-discharge lamp, the discharge taking place in a small, rectangular cavity in a ceramic block. The electrodes were sputtered on to the opposite, long sides of the cavity. See Fig. 2. Light from the cavity was focused on to the negative film to produce a ribbon of exposed emulsion, in which the modulation produced ripples in the density of the exposure. This is illustrated in Fig. 3. Care was required in setting up the exposure. Over-exposure resulted in a light print with a good deal of

distortion because of signal clipping. Under-exposure created a dark print with similar clipping and noise created by the granular nature of the film's emulsion. To get it right one had to hit the middle of the gamma curve, see Fig. 4.

The other method of recording sound on film optically was the variable-area system, see Fig. 5. This used a device known as a light valve, which consisted of an aluminium ribbon that was suspended under tension in a strong magnetic field – rather like a ribbon microphone. See Fig. 6. The audio signal was fed to the ribbon, which moved in the magnetic field, acting as a variable shutter to light from an

Rectangular cavity with upper and lower surfaces metallised.

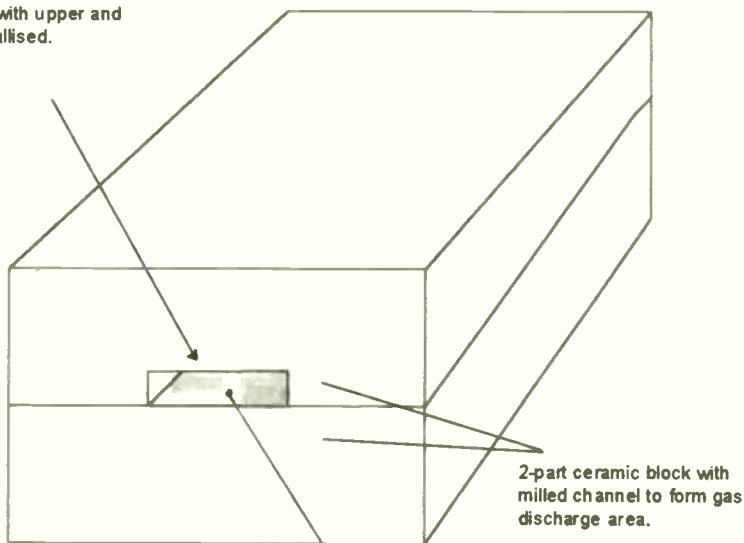


Fig. 2: The Aeolight used for variable-density optical audio recording. The helium-filled gas-discharge tube was operated at 200-400V.



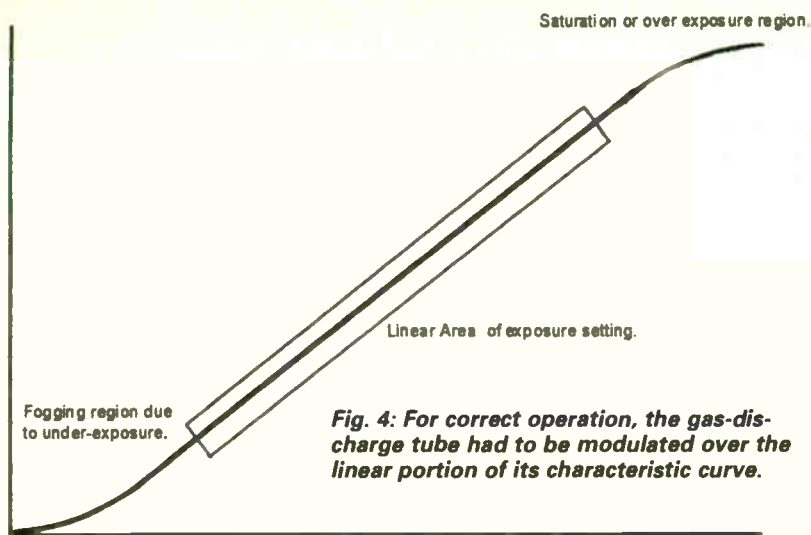


Fig. 4: For correct operation, the gas-discharge tube had to be modulated over the linear portion of its characteristic curve.

incandescent exciter lamp. This was run from a DC source to avoid intensity modulation by hum. The light passed through an aperture, whose width was carefully designed to be less than half a wavelength at the top audio frequency – usually about 8kHz. This was done at the standard film speed of 18in./sec. The result was a sound track that resembled an oscillogram of an amplitude-modulated RF carrier wave.

Of the two methods the variable-area one was preferred and retained, because of its superior frequency response and amplitude. It still required care with exposure at the time of recording, and also while printing to avoid scatter of the exposure illumination. Over-exposure of the film causes sibilance in the reproduced audio, because of image spread from scatter.

There is also the problem of intermodulation, caused by the light bleeding at the edges of the aperture. This produces spurious exposure of the film in areas adjacent to that where the focus falls.

Causes of deterioration

Today we have digital audio, noiseless backgrounds and wide frequency responses. This makes the films of the Golden Age of Hollywood sound like 78 RPM records. Fading of the emulsion reduces the contrast (amplitude) available, and increased amplification to compensate is accompanied by increased hiss. Blemishes in the track as a result of ageing, and damage and dirt caused by inconsiderate use, introduce 'noises off' that further detract from the quality of the audio.

Restoration

Just as many audio disc recordings have been cleaned up and re-released as CDs, so the turn of the old optical film sound track has come. It is insufficient however just to remove the ticks, pops and hiss from these tracks. Some way of restoring the original photographic image, which is what the sound track is,

has to be undertaken first.

Enlarged portions of the optical track are examined to determine the best course of action for the restoration process. The optical image is scanned at high resolution and cleaned up in the graphical mode, removing sprocket-hole shadows that can in some cases introduce a 96Hz buzz in the background. Another step is to black out grey unmodulated 'land' at each side of the track, using a set of algorithms that have the effect of reducing grey noise and rustling sounds from the film grain. Other digital processes counteract distortion caused by image spread during printing. This is done by producing a computer model of the spread. Fig. 7 shows a variable-area optical track before and after processing.

Cleaning up variable-density optical tracks is more complex. Further distortion-correction algorithms have to be added to correct for the effect of intermodulation distortion and to adjust the gamma curve. Fig. 8 shows a variable-density track before and after restoration.

The cleaned-up sound-track image, existing as a digital image only, is then stored in memory from which it can be taken as a WAV file that can be edited and possibly augmented in an audio workstation. Alternatively the WAV file can be played back as baseband audio or copied on to a new digital master and remarried with the picture. As the process does not require the recording of the sound and picture on film again, the entire production can be stored digitally for presentation.

Much can be done today with the products of yesteryear. The pioneers of this restoration work ensure that the quality of these old recordings is improved while the character is retained.

Fig. 8: Variable-density recording before (left) and after (right) restoration.



Fig. 5: Representation of variable-area optical sound film recording.

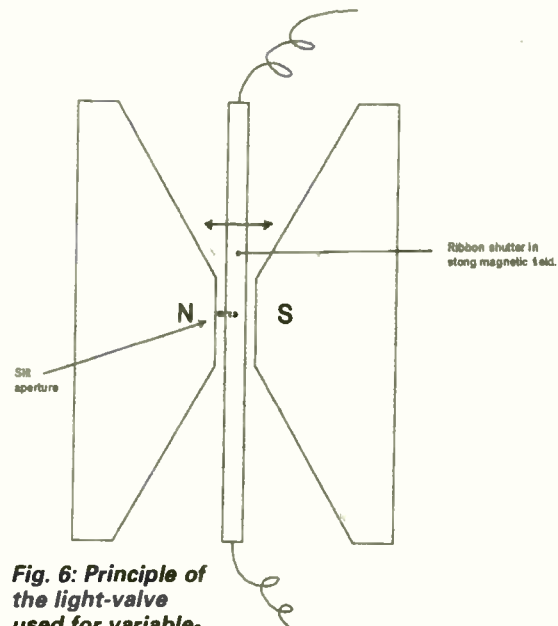


Fig. 6: Principle of the light-valve used for variable-area recording.

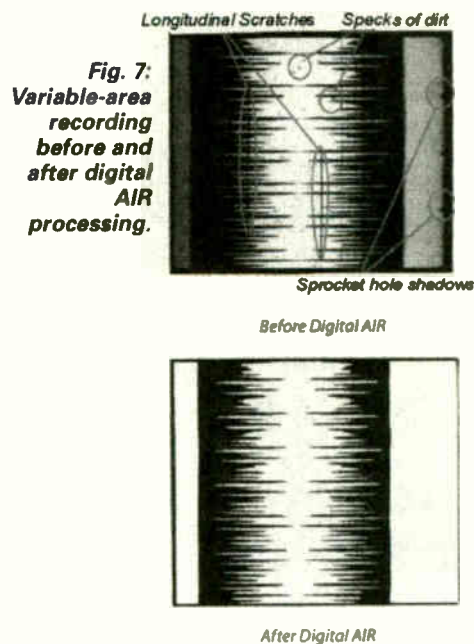
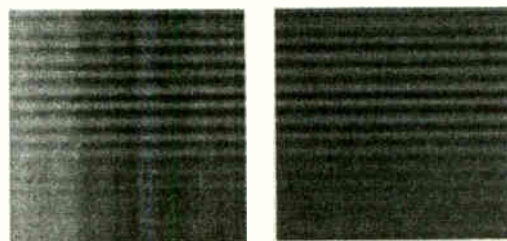


Fig. 7: Variable-area recording before and after digital AIR processing.



14" CTV R/C
FROM



£29.99

20" CTV R/C
FROM



£37.99

28" WIDESCREEN
R/C TEXT FROM



£99.99

32" WIDESCREEN
R/C FROM



£199.99

TECHNIKA
MULTIREGION
DVD FROM



£24.99

VCR'S FROM



SPECIAL!!

£16.99

DVD'S FROM



MULTIREGION

£24.99

KE14P2B



14" Tv/Vcr Combi
From

£54.99

Panasonic
KXFP155



Plain Paper Fax

£59.99

INFLATABLE
Speakers From



Brand New!!

£12.50

Hitachi Radio
Alarm Clock



£39.99

SONY DAV-S888

NEW!!



*Sony Dvd Home Cinema
*Dvd/Cd/Cdr/Cdrw/Mp3 Playback
*6 Speaker System
*Total 600W: 100W x 5 100W RMS
(10% THD), 12 Months Warranty!

£497.99

TECHNICS SCHDV560



SPECIAL!!

*Technics Compact Component
Stack System
*CD, Tape, Tuner
*Input select
*Silver w/Brown Side Panels

£199.99

DANSAI
MULTIREGION
DVD FROM



£29.99

OMICRON HALOGEN HEATER



Halogen Technology
Instant Heat
Variable Heat Settings
Low, Medium & High
Thermal Safety Cut Out
Stability Safety Cut Out
Double Safety Grills
Low Running Costs
Oscillating Feature

Brand New!! Only £15.99

INTERCOM SECURITY SYSTEM



*Bell camera and full Accessories included
*Additional camera sold separate
*Infra Red Camera for Night vision
*Built in Mic for sound
*optional electric door latch activation
*Switch Between camera with A/B switch
*Two Way speech
*250 metre cable
*Audio/visual output

£34.99

MORPHY RICHARDS
2 SLICE TOASTER



£7.49

PHILIPS FWC115 MICRO HIFI
MINI HIFI SYSTEM



£39.99

POP IDOL KARAOKE MACHINE



£84.99

FIRST AUSTRIA MCB-1050
MINI HIFI



£44.99

FIRST AUSTRIA MCD1010
MICRO HIFI SYSTEM



£29.99

TECHNICS SP-96



BRAND NEW!!

3x SURROUND SPEAKERS
SILVER!!

£13.99

Naiko Dishwasher
NDW080



£49.99

Panasonic
NVGS10B



£269.99

HITACHI
Cv800/810



£16.99

HITACHI
HTDK150EUK



£119.99

WWW.TRADEELECTRONIX.CO.UK INFO@TRADEELECTRONIX.CO.UK

MUCH MORE TV'S VCR'S DVD'S HIFI'S ETC IN STOCK!!

All Goods are Graded unless otherwise stated, Goods are subject to Vat, carriage & availability Prices subject to change without prior notice

Trade
ElectroniX

30/34 River street Digbeth B'ham B5 5SA
Tel:0121 773 3300 Fax 0121 773 2300

The following list gives spares department addresses and telephone numbers or, where these are the same, service department or head office addresses and telephone numbers. Also included are details of various spares distributors. Stocks of spares may no longer be available for defunct brands.



TV/VCR SPARES GUIDE 2004

Aiwa Business Division
Dealer spares Tel 0870 1699 602
Fax 0870 1699 603.
e.mail: rosemary.small@eu.aiwa.com
Account holders only. See also
CPC, KSA Wholesale Components,
SEME and Willow Vale.

Akai Spares from Prima
International, Prima House, Premier
Park, Oulton, Leeds LS26 8ZA.
Tel 0113 251 1500
Fax 0113 251 1515.
e.mail: akaispares@prima-
international.com
See also CPC, Chas Hyde and
Wizard.

Akura See CPC, also Iain Stewart.

Alba Radio Ltd., 12 Thames
Road, Barking, Essex IG11 0HZ.
Spares for Alba, Bush, Roadstar
and some Goodmans and Hinari
models. Some Brother microwave,
Dirt Devil and Power Devil spares.
Tel 020 8787 3000
Fax 020 8787 3110.
See also CPC, SEME, Willow
Vale, and Wizard.

Amstrad Spares handled by
CPC. See also Willow Vale and
Wizard.

A.R.D. Electronics Plc.,
Warehouse and Distribution
Centre, Shorten Brook Way,
Altham Business Park, Altham,
Accrington, Lancashire BB5 5YL
Tel 01282 683 000
Fax 01282 683 010.
e.mail: sales@ardelectronics.com

Beko Plc., Beko House, 36/38
Caxton Way, Watford Business
Park, Watford, Herts WD 8QZ.
Tel 0870 774 1059

Fax 0870 774 1090.
e.mail:spares@beko.co.uk
See also SEME.

Beovision/Beocord Bang and
Olufsen UK Ltd., Unit 630,
Wharfedale Road, E. Triangle,
Winnersh, Berks RG415TP.
Tel 0118 969 2288
Fax 0118 969 3388.

Binatone Telecom plc., Unit 1,
Ponders End Industrial Estate, East
Duck, Lees Lane, Enfield EN3 7SP.
Tel 01325 304473
Fax 020 8344 8877
Trade only.

BPL Spares for TV sets made in
India Pre 1997 available from
Falmouth Hi Fi, 14 Market Strand,
Falmouth, Cornwall TR11 3DE.
Tel 01326 313 412.
e.mail: falmouthhifi@yahoo.co.uk

Bush See Alba Radio Ltd. Also
CPC, SEME and Willow Vale.

Cambridge Spares available
from CPC and SEME.

Canon Consumer Imaging
Service Centre, Unit 130
Centennial Park, Elstree WD6 3SE.
Tel 0870 241 2161
Fax 020 8731 4139.
See also CPC.

Comet Group plc., After Sales,
PO Box 92, Preston PR2 9GY.
Tel 08706 052 020
Fax 01772 664 835.
e.mail:accessoriesdirect@cpc.co.uk

CPC Plc., Component House,
Faraday Drive, Fulwood,
Preston, Lancs PR2 9PP.
Tel 08701 20 25 30

Fax 08701 20 25 31.
e.mail:sales@cpc.co.uk
online:www.cpc.co.uk
Authorised spares distributor for
AEG, Aiwa, Alba, Amstrad,
Ariston, Bauknecht, Belling,
Blomberg, Bosch, Brandt, Braun,
Brother, Bush, Candy, Cannon,
Citizen, Creda, Crusader,
Daewoo, Delonghi, Electra,
Electrolux, English Electric, Epson,
Ferguson, Fidelity, Funai, Goblin,
Goldstar, Goodmans (Alba),
Goodmans (Comet), Grundig,
Grundig B.S., Hewlett Packard,
Hinari, Hitachi, Hoover, Hotpoint,
Iberna, Ignis, Indesit, Ingersoll,
JVC, Kelvinator, Kenwood Audio,
Krupps, Lec, Leisure, Lexmark, LG,
Logik, Matsui, Miele, Moffat,
Morphy Richards, Moulinex, Neff,
Newworld, Norfrost, Nova
Scotia, Ocean, Olivetti, Orion,
Pace, Panasonic, Parkinson
Cowan, Philips, Pioneer, Proline,
Pye, Russell Hobbs, Saisho,
Samsung, Sanyo, Scandinova,
Scholtes, Sharp, Sony, Swan,
Technics, Technogas, Technolec,
Thomson, Toshiba, Tricity Bendix,
Triumph, Venturer, Whirlpool, and
Zanussi

Crown Spares available from
Key Electronics. See also SEME.

Daewoo Electronic Sales UK
Ltd., Daewoo Building, 640
Wharfedale Road, Winnersh
Triangle, Wokingham, Berks
RG41 5TP.
Tel 01189 252 577
Fax 01189 252 532.

Note: Daewoo brand products
only, not OEM products. For the
latter, refer to the original
distributor. Account holders only.
See also CPC and SEME.

Decca See Tatum (UK) Ltd. Spares
for chassis up to and including the
110/115 series available from D&S
Electronic Services, 78 Well
Meadow, Bridgnorth, WV15 6OE.
Tel 01746 766 641.

Denon Spares available from
Hayden Laboratories Ltd., Hayden
House, Chiltern Hill, Chalfont St
Peter, Gerrards Cross, Bucks SL9
9UG.
Tel 01753 888 447
Fax 01753 880 019.
e.mail:info@denon.co.uk

Dual See Wizard Distributors.

Elftone Electronics Ltd., 4
Beresford Avenue, Wembley,
Middx HA0 1YZ.
Tel 020 8902 6222
Fax 020 8903 5011.
e.mail: enquiry@elftone.com

Etron Brand name used by
Nikkai Imports Ltd.

Eurosat Distribution Ltd, 5,
Oxgate Centre, Oxgate Lane,
London NW2 7JA.
Tel 020 8452 6699
Fax 020 8452 6777.
www.eurosat.co.uk

Expert. Sets use Tatum, GEC, or
Luxor chassis.

Falmouth Hi Fi, 14 Market
Strand, Falmouth, Cornwall TR11
3DE. Spares available for Pre
1997 BPL, Dansai, Datsurai, Kuro
and Zenor.
Tel 01326 313 412.
e.mail: falmouthhifi@yahoo.co.uk

Ferguson Spares available from
Thomson Sales UK Ltd., 30 Tower



TV/VCR SPARES GUIDE 2004

View, Kings Hill, West Malling,
Kent ME19 4NQ.
Tel 01732 520 958
Fax 01732 520 971.
Trade only.
e.mail: spares@thomson.net
See also CPC, HRS, Chas Hyde,
SEME and Wizard.

Fidelity Spares available from
SEME, HRS, CPC, Wizard and
Willow Vale.

Finlux Spares available from
GenServe Ltd.

Fisher Spares available from
Sanyo UK Sales Ltd., Sanyo
House, Otterspool Way, Watford,
Herts. WD2 8JX.
Tel 01923 477 350
Fax 01923 477 355.
See also CPC and Chas Hyde.

Fujitsu General, Unit 150
Centennial Park, Centennial
Avenue, Elstree, Herts WD6 3SG.
Tel 020 8731 3450
Fax 020 8731 3451
e.mail:
ann.north@fujitsugeneral.co.uk
www.fujitsugeneral.co.uk

GEC Spares available from CPC,
HRS, and SEME.

General See Fujitsu General.

GenServe Ltd.,
11 Caen View, Rushy Platt,
Swindon SN5 8WQ.
Service 01793 886 333
Spares 01793 886 322.
Spares available for Finlux,
Nokia, Luxor, Salora and Skantic.
Fax 01793 886 323.
e.mail:genserve@dial.pipex.com

GoldStar See LG Electronics UK
Ltd. Also A.R.D, CPC, Charles
Hyde and SEME.

Goodmans See Alba Radio Ltd.
or Comet Group plc. depending
on model. Also CPC.

Grundig Spares available from
CPC and Willow Vale. Spares for
VCR4000 and SVR4004 ranges
available only from Willow Vale.

Harwood Spares available from
Key Electronics.

Hinari Spares available from
CPC, Chas Hyde and SEME.

Hira The Hira Co., Ltd., Elizabeth
House, 1 Elizabeth Street,
Manchester M8 8JJ.
Tel 0161 8347 432
Fax 0161 8324 566.

Hitachi Sales (UK) Ltd.,
Dukes Meadow, Millboard Road,
Bourne End, Bucks SL8 5XF.
Tel 01628 643 435
Fax 01628 643 000.
www.hitachi.service
See also Charles Hyde and
Willow Vale.

HMV Sets use Ferguson or
Fidelity chassis.

HRS Electronics Ltd., Medco
House, Connect Business Park,
Bordesley Green Road,
Birmingham, B9 4UA.
Tel 0121 766 6668
Public orderline
Tel 0121 766 5124
Fax 0121 766 7274.
e.mail:
mailorder@connect-distribution.co.uk
Wide range of video, audio and
television spares for Fidelity,
GEC, Hitachi, NIKKAI, Pace,
Philips, Pye, Saisho, Sanyo,
Sharp, Tatung, Toshiba and many
more. Also all leading domestic
appliance brand spares.

Charles Hyde & Son Ltd.,
Number 1, Halifax Way,
Pocklington Industrial Est,
Pocklington, Yorks YO42 1NR.
Tel 0870 990 9474
Fax 0870 990 9473.
Web site: charleshyde.co.uk
Sole authorised UK spares
distributor for Akai, Hitachi,
Marantz, Nokia, Sanyo, Teac,
Tascam and Yamaha.
Sole UK distributor for "COM"
Ruvido RC programming system.

Sanyo trade technical help line
(by subscription) Approved spares
and accessories distributor for
Alba/Bush, Thomson/Ferguson,
JVC, Goldstar, LG, Matsui, Philips,
Saisho and Sharp.
ASWO Distributor for UK and
Ireland.

Extensive spares stocks available
for Mitsubishi, Samsung, Sony
and Toshiba.

Selected ranges of specific
genuine and/or replacement
pattern spares for Decca, Fidelity,
Hinari, GEC, Grundig, Luxor,
NordMende, Orion, Panasonic,
Saba, Salora, Sentra, and Tatung.
Full range of semiconductors,
passive components, triplers,
LOPTs and remote controls.

Iain Stewart
3 Royds Avenue, Linthwaite,
Huddersfield HD7 5QU.
Tel 01484 842 761
Mobile 0777 307 0474.
Stockist for Akura, NEI and
Nikkai spares.

ITT Spares available from
GenServe Ltd. See also CPC.

JVC (UK) Ltd., JVC House, JVC
Business Park, Priestley Way,
Staples Corner, London NW2 7BA.
Tel 0870 330 5001
Fax 020 8452 5415.
e.mail:accessories@jvc.co.uk
Account holders only.
See also CPC, Chas Hyde and
Willow Vale.

Kenwood Electronics UK Ltd.,
Kenwood House, Dwight Road,
Watford, Herts WD18 9EB.
Tel 01923 816 444
Fax 01923 819 131.
See also KSA.

Key Electronics Unit 5, Brow
Mills Industrial Estate, Brighthouse
Road, Hipperholme, Halifax
HX3 8EF.
Tel 01422 203676
Fax 01422 263224.
Spares for Crown Corporation,
Harwood, Kyosho, NIKKAI and
Ssangyong products.

Konica Plane Tree Crescent,
Feltham, Middx TW13 7HD.
Tel 020 8751 6121
Fax 020 8755 0681.

Körting See SEME.

KSA Wholesale Components,
582 Green Lane, Small Heath,
Birmingham B9 5QG.
Tel 0121 772 2834
Fax 0121 772 7487.
Authorised spares distributor for
Aiwa, Kenwood, Philips, Philex,
Pioneer, and Samsung.

Kyosho Spares available from
Key Electronics.

LG Electronics UK Ltd., LG House,
264 Bath Road, Slough, Berks SL1
4DT.
Tel 0870 607 5544
Fax 01753 517 445.
See also A.R.D. Electronics, CPC
and Willow Vale.

Lloytron Laltex Group, Laltex
House, Leigh Commerce Park,
Greenfold Way, Leigh, Lancashire
WN7 3XH.
Tel 01942 687 000
Fax 01942 687 070.

Logik Brand name used by
Dixons. Spares available from
Partmaster, CPC, HRS.

Loewe Spares available from
SEME and Wizard.

Luxor Spares available from
GenServe Ltd., CPC, Charles
Hyde and Willow Vale.

Manhattan
Eurosaf Distribution Ltd., Oxgate
Lane, London NW2 7JA.
Tel 020 8452 6699
Fax 020 8452 6777.

Marantz Hi Fi UK Ltd.,
Kingsbridge House, Padbury
Oaks, 575/583 Bath Road,
Longford, Middx UB7 0EH.
Tel 01753 680 868
Fax 01753 680 428.
See also Charles Hyde & Son
Ltd.

Matsui Brand name used by
Currys and Dixons. Spares
available from Partmaster. Also
CPC, Charles Hyde, SEME and
Wizard.

Mitsubishi Spares available
SEME, CPC, Willow Vale and
Wizard.



TV/VCR SPARES GUIDE 2004

Morphy Richards

Spares available from Roberts Radio Technical Services.

NEC Spares available from SEME and CPC.

NEI See Iain Stewart and SEME.

Nikkai Spares available from CPC, HRS, Iain Stewart, Key Electronics and Wizard.

Nokia Spares available from GenServe Ltd. and Charles Hyde.

NordMende Spares available from Thomson Multimedia. See also SEME.

Orion See CPC and Chas Hyde.

Pace Micro Technology plc, Victoria Road, Saltaire, Shipley, West Yorkshire, BD18 3LF. Tel 01274 532 000 Fax 01274 537 128. e-mail: eesa.bismillah@pace.co.uk Spares also available from SEME Eurosai, HRS, and CPC.

Panasonic (UK) Ltd., Panasonic House, Willoughby Road, Bracknell, Berks RG12 8FP. Tel 01344 860 133 Fax 01344 861 598. See also SEME Ltd. e-mail: spares@panasonic.co.uk

Partmaster Direct, PO Box 1924, Sheffield S2 5XX. Tel 0870 909 0444 Fax 0870 909 0333. www.partmaster.co.uk e-mail: sales@partmaster.co.uk Spares for Dixons/Currys ranges - Matsui, Link, Logik, Prinz, Saisho and Sanyo. Most manufacturers parts available.

Philips Consumer Electronics

Spares, 420/430 London Road, Croydon CR9 3QR. Tel 020 8683 3746 Fax 0208 781 8906. e-mail:

cesparesuk.orders@philips.com Account holders only supplied. See also CPC, HRS, Chas Hyde, KSA, Willow Vale and Wizard.

Pioneer (GB) Ltd., Pioneer House, Hollybush Hill, Stoke Poges, Slough SL2 4QP. Tel 01753 789 876 Fax 01753 789 534. Account Holders only. See also CPC, KSA and SEME.

Prinz Brand name used by Dixons. See Partmaster.

Proline Brand name used by Comet Group plc.

Pye See Philips Service. Also SEME.

Quart see Denon.

Questar See CPC.

Roberts Radio Technical Services 97-99 Worton Road, Isleworth, Middx TW7 6EG. Tel 0208 560 6644 Fax 020 82329739 Helpline 020 8758 0338. e-mail: spares@rmtv.co.uk Spares for Roberts Radio and Morphy Richards models.

Roadstar See Alba, CPC and SEME.

Saisho Brand name used by Dixons. See Partmaster, CPC, HRS, Charles Hyde, SEME, Willow Vale and Wizard.

Salora Spares available from GenServe Ltd. and CPC.

Samsung Euro Service Centre, Unit A, Stafford Park 12, Telford Shropshire TF3 3BJ. Tel 01952 207 171 Fax 01952 293 459 (spares only). Also CPC, Charles Hyde, KSA, Willow Vale and Wizard. Agents in Ireland Don Berg Electronics Ltd., School Masters

House, Ranafast, Co Donegal, Eire. Tel 00 353 754 8275 Fax 00 353 757 1031.

Sonyo UK Sales Ltd., Sanyo House, Otterspool Way, Watford, Herts WD25 8JY. Tel 01923 477 350 Fax 01923 477 355. See also Chas Hyde, and Partmaster.

Schneider Spares available from Wizard and CPC.

SEME Ltd., Hudson Road, Melton Mowbray, Leics LE131BS. Sales Hotline 01664 484 000 Fax 01664 563 976. e-mail: sales@seme.co.uk Web: www.seme.co.uk Sole authorised distributor for Beko, Black Diamond, Daewoo, Loewe, Mitsubishi, Pioneer and Toshiba.

Authorised spares distributor for AEG, Airflow, Alba, Aiwa, Baird, Beko, Bendix, Bissell, Bush, Crown, Creda, Cannon, Daewoo, Electrolux, Europart, Ferguson, Hotpoint, JVC, LG, Matsui, Merloni, Morphy Richards, Panasonic, Pace, Philips, Pioneer, Pye, Parkinson Cowan, Saisho, Scholtes, Siemens, Sharp, SMEG, Sony, Tatung, Technics, Thomson, Tricity, Thorn and Zanussi. Spares available for Akai, Amstrad, Bush, B&O, Braun, Burley, Cambridge, Crosslee, Decca, Denon, Dyson, Fisher, Finlandia, Finlux, GEC, Goodmans, Grundig, Hinari, Hitachi, Kenwood, Leisure, Logik, Nokia, Numatic, Orion, Pifco, Proline, Saba, Sabre, Salora, Samsung, Schneider, and Suncrest.

Sharp Spares available from A.R.D. Electronics, Willow Vale, CPC, HRS, SEME and Wizard.

Siemens Spares available from Appliance Care Limited, Unit F4, Ballymount Drive, Ballymount Road Industrial Estate, Walkinstown, Dublin 12. Tel 00353 145 02655 Fax 00353 145 02520.

Skantic Spares available from GenServe Ltd.

Sony UK Ltd., Spares Division, PO Box 58, Newbury, Berks RG13 9LQ. Tel 01635 861 133 Fax 01635 874 099. Sony and Aiwa account holders only. See also CPC, Chas Hyde, Willow Vale and Wizard.

Ssangyong Spares available from Key Electronics.

Steepletone Products Ltd., Park End Works, Croughton, Nr Brackley, Northants NN13 5RD. Tel 01869 810 081 Fax 01869 810 784.

Tatung (UK) Ltd., Service Division, Stafford Park 10, Telford, Shropshire TF3 3WF. Tel 01952 290 111 Fax 01952 292 096. Dealers only. Non-account holders should contact Wizard or www.servicebridge.co.uk.

Technics See Panasonic.

Telefunken Spares available from Thomson Multimedia (see Ferguson).

Teleton See Fujitsu General.

Texet Spares available from The Hira Co, Ltd.

Thomson See Ferguson and Willow Vale.

Thorn brand equipment. Spares available from Wiltsgrove.

Toshiba European Service Centre, Units 6/7 Admiralty Way, Southern Trading Centre, Camberley, Surrey GU15 3DT. Tel 01276-694 000 Fax 01276-600 521. www.toshiba.co.uk See also A.R.D. Electronics, CPC, HRS, KSA, Chas Hyde, SEME, Willow Vale and Wizard.

Trical Brand name used by Hinari Consumer Products Ltd.

Trio See Kenwood Electronics.



TV/VCR SPARES GUIDE 2004

Wharfedale See Wiltsgrove

Willow Vale Electronics Ltd.,
Connect Business Park, Bordesley
Green Road, Birmingham B9 4UA
Tel 0870 6000 271
Fax 0870 6000 272.
E-mail sales@willowvale.co.uk
Web www.willowvale.co.uk
Appointed spares distributor for
JVC and Sharp.

Spares distributor for Alba,
Amstrad, Aiwa, Bush, Grundig,
Hitachi, LG, Mitsubishi, Pace,
Panasonic, Philips, Saisho,
Samsung, Sony, Tatung,
Thomson, Toshiba.
Distributor for Altai, Antex, AWI,
Classic, Electrotube, ERL, Hameg,
Kamasa, Labgear, MBO, Mercury
Telecraft, One for All, Philex,
Portasol, Servisol, Treston, TTI,
Uniross, Vogels, Wavetek, Weller,
and many others.

Wiltsgrove Ltd., 35-38 River
Street, Digbeth, Birmingham B5
5SA.
Tel 0121 772 2733
Fax 0121 766 6100.
e-mail: sales@wiltsgrove.co.uk
Official distributor for Antex,
Adcola, CME, König, Nikkai,

Philex and Thorn.
Spares also stocked for Akai,
Aiwa, Akura, Alba, Amstrad,
Beko, Bush, Daewoo, Decca,
Ferguson, Fidelity, Finlux,
Goldstar, Goodmans, Granada,
Grundig, Hinari, Hitachi,
Hyundai, JVC, Kenwood, LG,
Matsui, Orion, Panasonic, Philips,
Proline, Roadstar, Samsung,
Sansui, Sanyo, Schneider, Sharp,
Sony, Tatung, Thomson, Toshiba,
Wharfedale and HR Diemen.

Wizard Distributors, Empress
Mill, Empress Street, Manchester
M16 9EN.
Tel 0161 872 5438 or
Tel 0161 848 0060
Fax 0161 873 7365
e-mail:
sales@wizard-distributors.co.uk

Website: Information, spares
catalogue and order page
www.wizard-distributors.co.uk
Sole authorised distributor for
Tatung/Decca. Approved
distributor for Ambersil, Antex,
Classic, Mercury, Philex, Servisol
and Sharp.

Spares also stocked for Akai,
Alba, Bush, Dual, Ferguson,
Hitachi, Loewe, Matsui,
Mitsubishi, Philips, Saisho,
Samsung, Schneider, Sentra, Sony
and Toshiba. Trade only.

Yamaha

Spares available from Charles
Hyde

Zenor Made in India models see
BPL.

General/miscellaneous parts suppliers

Cricklewood Electronics
40-42 Cricklewood Broadway,
London NW2 3ET
Tel 020 8452 0161
Fax 020 8208 1441.
www.cricklewoodelectronics.co.uk

Economic Devices,
The Coach House, Muxton Lane,
Telford, Shropshire
Tel 01952 273130
Fax 01952 405478.
e-mail: john@telepart.co.uk

East London Components,
63 Plashet Grove, East Ham,
London E6 1AD.
Tel 020 8472 4871
Fax 020 8503 5926.

Electromail, PO Box 33,
Corby, Northants NN17 9EL.
Tel 01536 204555
Fax 01536 405 555.

Electrovalue Ltd,
Unit 5, Beta Way, Thorpe Ind.
Park, Egham, Surrey TW20 8RE.
Tel 01784 433 604
Fax 01784 433 605.

Express Tubes,
The Mill, Mill Lane, Rugeley,
Staffs WS15 2JW.
CRTs only supplied

Tel 01889 577 600
Fax 01889 575 600.

**Farnell Electronic
Components**, Canal Road,
Leeds LS12 2TU.
Tel 0870 1200 200
Fax 0870 1200 201.

Grandata Ltd,
KP House, Unit 15, Pop In
Commercial Centre, Southway,
Wembley, Middx HA9 0HB.
Tel 020 8900 2329
Fax 020 8903 6126.
e-mail:sales@grandata.co.uk

J.W. Hardy,
231 Station Road, Stechford,
Birmingham B33 8BB.
Tel 0121 784 8478
Fax 0121 789 7931.

Irwin Electronics,
Unit 200, JC Albyn Complex,
Burton Road, Sheffield S3 8BX.
Tel 0114 273 9622
Fax 0114 273 7919.

LRC Broadcast S
5 Whitfield Street, London
W1T 2SA.
Tel 020 7323 2107
Fax 020 7323 2191.

Manor Supplies,
9 Whitchurch Parade,
Whitchurch Lane, Edgware,
Middx HA8 6LR.
Tel 020 8952 8808
Fax 020 8952 8809.

Maplin Electronics, Freepost
NEA9433, Barnsley S73 0BR.
Tel 01226 751 155
Fax 0870 264 6001.
e-mail: <recipient>@maplin.co.uk
Website: www.maplin.co.uk

MCES, 15 Lostock Road,
Davyhulme, Manchester M41
0ES.
Tel 0161 746 8037
Fax 0161 746 8136.
www.mces.co.uk
Tuner, modulator, upper drum,
LNB and digital TV equipment
repairs.

Nikko Electronics, 358
Kingston Road, Ewell, Surrey
KT19 0DT
Tel 020 8393 7774
Fax 020 83937395.

Philex Electronic Ltd.,
Philex House, Kingfisher Wharf,
London Road, Bedford MK42
0NX
Tel 01234 263 700

Fax 01234 267 097.
e-mail: sales@philex.com

PV Tubes, 108 Abbey Street,
Accrington, Lancs BB5 1EE.
Tel 01254 390 936
Fax 01254 872 166.

RS Components, PO Box 99,
Corby, Northants NN17 9RS.
Tel 01536 201 201
Fax 01536 201 501.

Sendz Components,
63 Bishopsteignton,
Shoeburyness, Essex SS3 8AF.
Tel 01702 338 894
Fax 01702 338 805.

**TW Electronics (Newbury)
Ltd.**, Beacon House, Harts Lane,
Burghclere, Newbury, Berks
RG20 9JZ.
Tel 01635 278 678
Fax 01635 278 266.

Vista Electronics,
Unit 2, Wingate Grange
Industrial Estate, Wingate, Co.
Durham TS28 5AH.
Tubes:Tel 01429 837 100
Components: 01429 838 057.
Fax 01429 837 101.



What a Lovely Pair!



HORIZON DIGITAL TERRESTRIAL METER

HDTM

- Signal Strength and BER displayed together
- Pre and post BER displayed on sub menu
- 10 pre programmed transmitters (via website) or all channel step through
- Audible tune-in, with back light
- 7 or 8 MHz channels
- 2K and 8K mode
- Automatic Transmission and constlation
- VHF (band3) and UHF bands
- RF input range 167-862 MHz
- Input dynamic range -72dBm~-20dBm
- Input connector BNC. Input imp75 ohms. Loop through
- External power for mast amplifiers, etc.
- Built in universal charger 80-250 V Ac. Intelligent charger (CE approved) with delta V delta T detection. Fast charge, then Trickle
- Run time with full charge: Minimum 5 hours from 2.5 Ah battery
- Figure of 8 mains input connector. 2.1 mm Female PSU plug for external charge via supplied car charger
- Computer interface: Serial port (Com 1-4) for upgradeable software on transmitters.

HORIZON DIGITAL SATELLITE METER

HDSMV2

- Signal Strength and BER displayed together
- 32 Transponders or 16 satellites, horizontal & vertical
- Audible tune-in, with back light
- DVB, C&Ku band, Mpeg, V Sat compatible
- Input dynamic range -65dBm~-25dBm
- Input connector F-female. Input imp 75 ohms
- Symbol Frequency rate from 1 Msps~45Msps
- Universal charger 80 V ~ 250 V Ac Intelligent Charger (CE approved) with delta V delta T detection Fast charge, then Trickle
- Run time with full charge (single LNB). Minimum 3 hours from 2.4Ah battery
- Figure of 8 mains input connector 2.1 mm Female PSU plug for external charge v a car charger
- LNB short circuit protection 500 mA automatic limiter
- RF input range 950- 2150 MHz
- Computer interface: Serial Port (COM 1,2,3 or 4) for upgradeable software on satellite settings.

www.horizonhge.com

Speed up your installations call NOW on +44 (0)20 8281 3777
or email sales@horizonhge.com for a reliable solution



COLOUR TRADE

**POSSIBLY
LARGEST & OLDEST
EST. IN
THE UK EST FOR
30 YEARS**

Wholesaler Distributors & Expert Agents of
Domestic Electronics & Appliances

**FULL RANGE OF FACTORY
GRADED TV's DVD / VIDEOS
HI-FI SMALL & LARGE
DOMESTIC GOODS**

www.colourtrade.com

**WHOLESALE MADE EASY ON LINE, SIGN UP
NOW FOR OUR WHOLESALE PRICES.
ALL ORDERS DISPATCHED ON THE SAME DAY.**

**Now Available
TV's, DVD's, VCR & AUDIO**

Over 40 years of genuine experience

Experts on:-

Thomson • Sanyo • Beko • LG • Tatung • Ferguson
Bush • Funai • Pacific • Dansai • Samsung & more

**TECHNICAL SUPPORT
0907 076 70 80**

Call cost 60p min

MAIN DEALER

- Thompson
- Sanyo
- Beko



Tel: 0121 359 7020 Fax: 0121 359 6344

Phoenix House, 190 Bridge St. West, Newtown, Birmingham B19 2YT

Email: inquiries@colourtrade.com



DX and Satellite Reception

Terrestrial DX and satellite TV reception reports. Digital, broadcast and satellite TV news. DXing past, present and future. DAB reception in Canada. Roger Bunney reports



Reception via Hellas-Sat (39°E) during a police/military operation in Piraeus harbour. The schooner that was searched - a live picture at sunset.

There was very little DXTV reception during February. In fact the only reports I've received relate to Sporadic E signals. January 31st produced an unidentified ch. E3 signal, while the following day produced signals in chs. E3 and E4, again unidentified.

The ch. E3 Izana (Canary Is) transmitter has now closed down, but Hugh Cocks in the Algarve reports that the ch. E2 Madrid transmitter was still in operation in mid-February. It seems certain that there will be minimal SpE reception from Spain this coming season. DTT services are to start in neighbouring Portugal this summer and national coverage is expected to be achieved within three years. So we can expect announcements about the closedown of RTP analogue transmissions before long.

Over the past few decades Germany has been a rich source of Band III and UHF DX signals during enhanced tropospheric conditions. But the north German states are fast moving to DTT, using the DVB-T standard, and as DTT transmissions start the analogue transmitters will close down. There will be no period of parallel analogue/digital transmissions. The latest news on German services is as follows:

Koln/Bonn region: DTT to start on May 24 with 16-programme multiplexes on channels E26, E29, E36, E43, E49, E65 and E66. A further eight programmes per multiplex will be added from November 8.

Hanover/Braunschweig region: DTT to start on May 24 with 16-programme multiplexes on channels E8, E23, E24, E28, E31, E36, E44 and E60. A further eight programmes per multiplex will be added from November 8. Transmitter powers Hanover 20kW, Henningen 5kW, Braunschweig 5kW, BS-Kraftwerk 2kW.

Bremen/Unterweser region: DTT to start on May 24 with 16-programme multiplexes on channels E22, E29, E32, E42, E49 and E55. A further eight programmes per multiplex will be added from November 8. Transmitter powers Bremen 20kW, Steinmimmen 5kW, Schiffdorf 5kW.

Dusseldorf/Ruhrgebiet region: DTT to start on November 8 with eight-programme multiplexes on channels E9, E25, E29, E35, E39, E48, E52, E53, E55, E59, E64 and E66. A further 16 programmes per multiplex will be added from April 4 2005.

Hamburg/Lubeck region: DTT to start on November 8 with 24-programme multiplexes. Transmitter powers Hamburg-1 50kW, Hamburg-2 10kW, Berkenthin 20kW, Lubek 10kW.

Kiel region: DTT to start on November 8 with 16-programme multiplexes on channels E21, E24, E26, E35, E45, E50 and E55, with alternative channel allocations E5, E36 and E39. A further eight programmes per multiplex will be added from May 8 2005. The Kiel transmitter will run at 20kW.

DX reception of DAB signals has already been reported: we await the first report of DTT DX reception in Europe!

Satellite sightings

The most remarkable sighting this month was on Saturday February 7. Roy Carmen (Dorking) phoned and suggested that I check Hellas-Sat (39°E) where "something" was going on. It seemed that the police, aided by military forces, had taken over a two-masted schooner in Piraeus harbour, NW of Athens. The ship was being searched, and there were reports of injuries following an incident at the railway station. Inflatables were zooming around in the harbour, and there were flashing lights from numerous police vehicles. It was the biggest thing in Greece that weekend. Two satellite feeds were in operation from about 1500 until after 2200 hours, but the reporters spoke Greek which made it extremely difficult to grasp what the drama was all about.

Strangely there were no reports elsewhere, or in the next day's papers. The live pictures and reports for broadcaster ERT were at 11.182GHz V, "Police Fokea". At 11.173GHz V there were just colour bars with "Hellasat" inlaid, while at 11.191GHz V there were colour bars with "Police Piraeus-1 wrong line standard" inlaid. All three transmissions had a symbol rate of 6,070 and 3/4 forward error correction.

A week later tragedy struck at a water theme park in central Moscow when the roof collapsed, plunging ice, snow and debris over the swimmers. At least 26 people died in the rubble and sub-zero temperatures. The Russian uplink truck NTV RUS-2 was soon at the scene, relaying pictures of the survivors, rescue operations and ambulances taking the injured to hospital. The same uplink truck was in operation a few nights later using the same satellite and frequency: check Eutelsat W2 (16°E) at 12.563GHz H (5,632, 3/4).

Transatlantic ice hockey has reappeared via the Atlantic Bird-1 (12.5°W) GlobeCast lease (11.014GHz, H, 20,145, 3/4). The three-channel multiplex carried two matches on the 16th, LA versus NY in the Islanders Hockey series on channel 1 and the Ottawa Senators versus the NY Rangers on channel 2. It was in the clear. NASA-TV often uses this frequency for press conferences and, in recent times, has been reporting on the latest findings from the Mars probes and surface ranger units. A NASA presentation usually starts at about 1800 hours GMT and runs for about an hour, covering current activities and plans. The satellite has also been carrying, at 11.430GHz H (30,000, 5/6), a free-to-air promotion for the Eutelsat Open Sky internet service.

Unfortunately there is audio distortion and smudgy video with some of the multi-language repeats. For more information, check www.eutelsat.net, www.opensky.fr or www.broadsat.com. There's often a Washington to Europe reporter hook-up via this satellite's Telecom-band coverage, at 12.733GHz H (6,109, 3/4).

Europe*Star-1 (45°E) produces little in the low Ku band but sometimes fires up on Sunday afternoons. At 1600 hours on February 22 for example it transmitted a corporate banking presentation for a South African (Natal) bank at 11.515GHz V (5,632, 3/4), courtesy GlobeCast Africa. Much prolonged waffle then the transmission was terminated with no colour bars or identification. There was a rather more lively programme just up the band at 11.524GHz V (6,109, 3/4), a football finals match that seemed to be Nigeria versus Ghana. This was uplinked by Telemedia Tel. After the commentator's "goodnight" they simply switched off and went home. During a blind search scan one day Iraq Media appeared at 11.748GHz V (27,500, 3/4) but, when checking the memory line-up a couple of minutes later, the transmission had gone off-air. Typical!

Edmund Spicer (Littlehampton) reports changes at the TurkSat slot (42°E). Turkish national broadcaster TRT is now found here as a digital multiplex at 11.096GHz V (27,500, 3/4), including TRT-1, TRT-2, TRT International and at least eight radio stations. It's worth checking this slot when an important football match is being carried. Whereas Sky will encrypt this, TRT will carry it in the clear – and there are few ads with TRT, so few interruptions to the match!

Alan Richards, who has now moved to Lincolnshire, mentions that the Congo channel RTNC can be seen via Hispasat (30°W) at 11.558GHz H (20,150, 3/4) with good picture and sound quality.

Telecom 2D (8°W) often provides links for GranadaMedia satellite trucks and also hosts French regional TV, previously found at Intelst 801 (31.5°W). Apart from local-interest news you can also find some quite dramatic sporting action. On February 15 for example there was "France 3 Auve", with beach-buggy and motorcycle racing along a vast seaside beach. The satellite truck signed as "DSNG F3 OUEST". This was at 12.733GHz. An RSD check showed that the location was Auvergne. According to my atlas this is miles from the sea, suggesting that the truck crew hadn't changed the identification from the previous OB. Meanwhile DSNG F3 MEDITERRANEE was uplinking a cycle race for F3 Marseilles at 12.727GHz H. Perhaps the most dramati-



The Sudan TV tuning caption, received via Arabsat at 26°E.

ic however was snow-cart racing from the French Alps at 12.722GHz H for 'France 3 Alpes'. These transmissions all used 4,214 and 7/8.

Alan Richards noted more skiing via Telecom 2D with 'SAT-NET 9183' from Davos, Switzerland – lovely, sweeping views of the snowy mountains and the ski slopes, though much of the time was taken up with interviews. This was at 12.610GHz H (6,111, 3/4).

DXer's SPECIAL 14" TV



~~£299.00~~
SPECIAL OFFER
NOW ONLY
£249.00

Overnight delivery by insured courier £12.00

- Direct channel entry/readout
- Direct frequency entry 40-860MHz
- Multistandard
- Low noise tuner
- 12v DC and mains operation
- Remote control
- Scart connection
- Auto scanning of RF channels
- Auto scanning of frequencies 40-860MHz
- Cable tuner
- Video squelch (removed in tuning mode)
- Six teletexts
- Covers systems BG/LL/DKK PAL and SECAM, NTSC via the scart

FREE BBC VIEWING IN EUROPE

Perfect reception only with
the latest THOMSON digi box
12 volt SKY MINIBOX Now Available

- The correct digi box + the correct dish + the correct LNB = perfect reception anywhere
- Watch the BBC wherever you like, in Europe etc
- Digital satellite systems from only £399.00
- All dish systems are supplied with LNB, cable and plugs
- You can receive FREE viewing of BBC1,2,3,4, children's BBC, BBC24 hour news and all the BBC radio stations plus many more
- ITV1, Channels 4 and 5 available for a one off payment arranged by ourselves
- Increase your dish size with our new enhanced imported LNBs



Tripods £49.95

Digital system with
88cm dish — £438.95
with 1.1m dish — £478.95
ALL PRICES INC VAT

Overnight delivery in the UK for all items by insured courier £12.00

FULLY COMPREHENSIVE 35 PAGE CATALOGUE AVAILABLE BY RETURN OF POST FOR £1.50

AERIAL TECHNIQUES LTD Tel: 01202-423555 Fax: 01202-425055
59 Watcombe Road, Southbourne, Bournemouth, Dorset BH6 3LX, UK
E-mail: atech@dircon.co.uk www.aerial-techniques.com
Est 1979 Callers by Appointment please





An NTSC news feed between Baghdad and Canada via Intelsat 707 (1°W), using the ABC News lease.

Telecom 2D provides very strong signals in the UK. Most people across the UK should be able to follow the OB action using an 80cm dish.

Digital TV news

The Indian Ministry for Information and Broadcasting has said that the Doordarshan TV networks will be digital-ready for satellite transmission by mid-2004, but national DTT coverage will take some years to implement. Terrestrial TV is to remain predominantly FTA whereas satellite TV will be a mixture of FTA and Pay-TV.

Despite our report last month there is still no decision in South Korea about whether to use the US or the European DTT standard, with the government favouring the former and broadcasters the latter. It had been hoped that HDTV would have been available in several main cities by the end of 2003, but tests of the US system suggest that the transmissions are insufficiently robust. So the debate continues.

China is also delaying a decision while the relative merits of the US and European DTT systems are being assessed. A further consideration is that whichever system is adopted China would have to pay royalties. With the rapid growth of the Chinese electronics industry, there have been suggestions that a Chinese DTV system should be developed. The government hopes to introduce nationwide DTT by 2010.

The Norwegian government has come out in favour of introducing a DTT channel that will include NRK/TV-2, with a progressive analogue close down. No time-scale has been announced.

There are at present no specific plans to go digital in Russia. The Russian TV system operates across many time zones, and the cost of moving from analogue to digital transmission/reception will be high. The only positive move so far has been to ensure that as equipment is installed or replaced it will be digital-compatible.

Sweden's digital TV networks continue to expand. The Ministry of Culture has announced a further seven new DTV channels, increasing the DTT offerings to thirty channels. The Swedish analogue TV closure date is now 1 February 2008.

The French public-service DTT multiplex R1 will include France 2, France 3, France 5, Arte and Festival/Parliament. That's five out of the six channels decided. But a start date has still to be confirmed.

Broadcast news

The AJK-TV channel opened in the Pakistan section of Kashmir

in early February, the first independent TV channel in the region – though the government is funding the service, the TV centre and seven transmitters.

South African broadcaster SABC plans regional TV networks called SABC-4 in the North West, Limpopo, Guateng, Free State and Northern Cape provinces, and networks called SABC-5 in the Eastern Limpopo, Eastern/Western Cape, KwaZulu, Natal and Mpumalanga areas. There will be local-language plus Afrikaans- and English-language programming.

A new TV channel should soon be in operation in Tunisia, run independently of the state broadcaster ERTT. It is to be the first of several independent radio and TV stations in the country.

There is friction in the Armenia/Azerbaijan border areas, where at least six Armenian TV channels are apparently using frequencies allocated to Azerbaijan. This is mainly in the contended Nagorno Karabakh area.

Satellite news

Analogue test transmissions have been received from the new Israeli satellite Amos-2 (4°W) at 10.742-10.893GHz V. Reception should be OK across Europe with a 90cm dish.

The Alhurra Television Network came into operation on February 14, with transmissions via NileSat and ArabSat capacity. The US-run network is currently broadcasting for 14 hours a day, offering news, current affairs and general-interest programmes with Arabic-language sound. Round-the-clock operation is envisaged. Programmes are produced in the US, with input from offices in Amman, Baghdad and Dubai – it sounds like an Arabic version of the Voice of America.

Satellite TV seems to be thriving in the Middle East. It's estimated that by the end of the year some 4.5m households will have dishes. Satellite reception has grown massively in Iraq since the end of the Saddam regime and punitive import taxes.

A new French-language channel, Corse Mediterranee, is being planned for Corsica. It will be funded by the French government, with France 3 providing technical and production support. There will be 17-hour operation, and the coverage will extend to North Africa and Western Europe.

A UK-based digital satellite service, Frontage Satellite Television (FSTV), is to produce programming for Nigeria. Uplinking will be via NSS-7 (21.5°W). The 25-channel multiplex will include BBC, sports and MTV content, with Kingston InMedia providing studio and editing facilities.

Fox Entertainment Group Inc. is to shift all downlinking plus news feeds to the PanAmSat fleet. Seventeen transponders have been leased for a ten-year period, though the agreement for cable feeds is for 15 years. The satellites involved are Galaxy 11/4R/3C and PAS-2/8/3R/9, giving coverage across the US Pacific and Atlantic regions.

The Korean educational channel EBS is to start 24-hour operation to help parents at present paying for private education outside school hours.

DXing past, present and future

The DXTV column first appeared in *Practical Television* (as we were then) back in 1964. I took over in 1971. During the past three decades coverage has expanded to include broadcast news and developments and satellite TV, from the early days of the SITE experiment (UHF) in 1976, through 4GHz reception from Gorizont to the present day. We have passed through several sunspot cycle peaks that have provided F2 signals, while multiple-hop SpE propagation has provided us with Band I signals from the Middle East and North America. There have been related articles on amplifiers, aerials, filters, satellite receiver circuits and specialised tuning systems. The arrival of Sky TV gave us analogue TV signals in the Ku band, and we were soon using tracking dishes to sample news feeds and foreign broadcasts. Things have certainly changed!

The march of technology has continued, and we are now in the digital era. Constructional work, apart from ancillary equipment

and dish hardware, is generally beyond the scope of enthusiasts. We have nevertheless adapted to domestic and 'DX' digital satellite reception. DAB-DX and DTT-DX are both possible, and some initial experiences have been reported here in recent months. Many analogue TV networks are now closing down, and the UK government is being pressed to announce a closure date.

In the February issue of *Skywaves*, a UK-based enthusiast publication that covers TV and FM DX, editor John Faulkner discusses changes to the DXing hobby and his magazine. It's at present distributed in print and e-mail forms, and could change to 'e-zine' form only within the next twelve months.

DAB is expected to take over from FM in the future in the UK, leaving the FM band empty. This will help with DXing, provided FM continues to be used on the Continent – remember how wonderful Band I DXing became after the closure of the 405-line services in the mid-Eighties! MW and SW DXing may falter as MW reception is made difficult as a result of PLT and other rogue RFI sources, while SW services close down because of lack of listeners, high cost and the alternative provided by internet streaming.

For digital radio and TV reception an adequate input signal is required – it either works well or not at all. There's no scope for coaxing a weak signal from the noise. Higher-gain aerials should help, and perhaps more attention to low-gain, low-noise amplifiers. DAB operates at the high end of Band III, with which we are familiar, and also Band L (1.49GHz). The latter is new to us, but we do have experience of the 4GHz and 12GHz satellite TV bands.

I hope to report on DTT and DAB DXing experiences in this column over the coming months – so we'd like to hear from you! Cyril Willis (King's Lynn) has reported successful DAB DX from across the UK and the Netherlands, distances of several hundreds of miles, without even using a correct DAB aerial! So there's hope. UK DTT multiplexes are also being received as DX signals during 'openings'.

The Medium Waveband won't shut down next week, and of all analogue radio bands will probably last the longest. Some analogue TV signals will be available for several years yet. But the future is digital, and we'll have to make the most of it.

DAB reception in Canada

In the February issue of *Skywaves* William Hepburn reports from Niagara, Ontario on his experiences with an L-band (1.452-1.492GHz) Radio Shack DAB receiver. The Korean-sourced Adapt DR-101-LF, made by the Personal Telecom Company, costs Canadian \$99. There are 23 multiplexes in L band, with five programme channels in each, making a total of 115 channels. Each multiplex is numbered LA to LW (L for the band), though they are at present known as channels 1-23 in Canada.

When you tune across the band it's silent. Should you find a multiplex that's in use it suddenly springs into life, with programming that starts at channel 1 of the specific multiplex. Tuning to a specific programme can be difficult. For example if you want programme 5, multiplex LI, which is CFMX Radio, you have to tune up through the multiplexes to LI then scroll to programme 5. Fast tuning through the multiplexes to LI will scroll through the programmes in each multiplex sequentially, unless you can scroll quickly and skip multiplexes. Another 'quirk' is that if a programme is lost, drops out or otherwise disappears, there is a lock-up time which may go back to programme 1 of the multiplex.

The general feeling in Canada seems to be that DAB is far from being a robust transmission mode – and that in its present form it can never compete with FM! William, at some 33 miles from the Toronto CN tower, can receive 35 DAB radio channels, either mono or stereo, running at between 96-224kbits/sec. Mono channels generally run at 96 or 128kbits/sec while stereo channels run at 192 or 224kbits/sec. in DAB Mode II version 1.1. For further information go to

<http://www.skywaves.info>

Book review

Digital Television Viewer's Guide 2004 by Clive Woodyear.
Paperback, 128 pages 150 x 210 mm. ISBN 1 871 611 660

This little book is intended for members of the public who want to choose and buy TV and video equipment, install it, and understand its features and benefits and what's available from the broadcasters. It explains all this excellently, but there's so

much information that it also forms a very handy and comprehensive reference book for the service and installation technician and the brown goods sales professional. For example, what programme packages are available from Sky TV at what price; what are the pros and cons of plasma screens; how does DVD-R compare with the +R version; how do you upgrade the disc capacity in digital PVRs; and where's the local TV transmitter and what powers does it use to transmit each channel/multiplex? These and more questions are answered concisely, with illustrations where appropriate.

The book starts with a news section and descriptions of product and broadcasting developments. This is followed by comprehensive details of Freeview and Sky TV; channel lists; features; aerials; foreign-language reception etc. There are sections on TV, widescreen, sound systems, VCRs and disc recorders, including the new hard-disk types like Sky+ and the Pace Twin. Information is provided on home-cinema systems, cabling, hook-ups and connections, and sending video and audio signals around the home. A separate section is devoted to interference and pic-

ture problems and solutions, with many off-screen pictures of actual symptoms. Twenty-five pages are devoted to UK transmitter information, including BBC and ITV analogue, Channel 5 and Freeview site maps and transmitter listings, with full details of channels, radiation powers and, for Freeview, multiplex allocations and powers.

Later sections of the book provide guides to Sky Digital dish installation and manual tuning; advice on TV and video for those with impaired hearing or vision problems; and masses of contact names, numbers and website addresses, ranging from broadcasters and regulatory bodies to manufacturers and accessory stockists. There are also details of many specialist journals, books and publishers, and sources of further information.

In my opinion this is an excellent book that no one involved in our trade, on the retail or servicing side, should be without. It's available from PO box 888, Plymouth, PL8 1YJ at £5.95 inclusive of post and packing. For further information phone 01752 872 888 or go to the website at www.viewersguide.co.uk **E.T.**





AUDIO FAULTS

Reports from
Geoff Darby
Chris Bowers
David I. Scott
Mike Leach
Philip Rosbottom and
J.S. Ogilvie

We welcome fault reports from readers – payment for each fault is made after publication.

Reports can be sent by post to:

Television Magazine Fault Reports,
Highbury Business,
Media House,
Azalea Drive, Swanley,
Kent BR8 8HU

or e-mailed to:
t.winford@highburybiz.com

Panasonic RX-ED90B

At a first glance this 'boom-box' style portable looked quite normal. But a closer look revealed two large knobs, one either side at the top rear, that were fixed to potentiometers. They were curiously marked – Tape VariSpeed and CD VariSpeed. The legends were carried on quite professional-looking clear plastic overlays around each knob. Two jack sockets, marked Power In/Out, were set in the rear battery cover. This worried me a bit, as the reported fault was no output.

When mains power was applied the standby LED glowed red but no amount of pushing on the on button produced any further signs of life. Once I had the unit apart, some probing and poking revealed that the main fault was caused by a defective flexiprint, the one that connects the main PCB to the motorised opening and closing top panel. The latter contains a lot more control buttons, the LCD screen and the system control chip IC801.

The flexiprint has some very sharp bends where it has to flex. Because of this several tracks had fractures and had become intermittent. A replacement flexiprint was ordered and then fitted, after which the unit powered normally – except that the on button had to be pressed quite hard and just so to get it to operate reliably. A salvaged tactile switch put that right.

This repair was not going to lie down however. I then discovered that volume-down didn't work, because the button hinges had gone bad – much like with a VCR. As a result the button didn't contact the switch correctly. Another order to Panasonic brought a replacement button unit. When this had been fitted the buttons operated the volume switches correctly but, as with the on/off switch, operation was poor. Two more salvaged switches put this right.

Everything now appeared to work, including variable-speed tape operation – this was just a potentiometer that had been connected in place of a fixed resistor in the motor speed-control circuit – and variable speed CD, though I can't imagine why anyone would want this. The latter was a bit more complex than the tape-speed modification. The potentiometer was attached to a small PCB with a single IC on it. The type had been scratched off, but I suspect that it was some type of VCO. It produced a variable-speed clock, which had been substituted for X701's output on the CD board. This 16.8344MHz crystal had been removed and the output from the variable oscillator had been connected to one of the vacated holes.

I should have known better than to think that all was now OK. Every now and then if you went from one mode to the other when selecting the left-hand tape deck, instead of going through stop, the mecha-

nism would jam. This was because the cam didn't rotate the first few degrees to move past a toothless 'neutral' section and engage with the drive gear on the flywheel. Yet another order to Panasonic brought a replacement cam gear and catch lever, which is controlled by a solenoid. Once these items had been fitted there was a considerable improvement in the situation, but the mechanism would still occasionally stick. After much head-scratching and dismantling I finally discovered that this last problem was being caused by the head plate not dropping the last millimetre to its rest position. Slight wear on a plastic guide was, in turn, the cause of this.

The guide provides a slight push to the head flip-over mechanism, right at the end of the head-plate disengagement action. Smoothing this guide, regreasing it and slightly increasing the tension on the head-plate return spring finally brought the job to an end. A long soak test proved that all functions now worked correctly and reliably. **G.D.**

Sony ICF-SW1

There was a distorted (motor-boating) sound from the speaker in this radio receiver. A look inside soon revealed the cause. Two surface-mounted electrolytic capacitors on the main board, C601 (100µF, 4V) and C608 (33µF, 4V), had started to leak. Replacements restored normal sound. **C.B.**

Sony STR-DB930

The motorised volume control didn't work via the remote-control unit. The other functions were OK. Checks on the small volume-control board, which is mounted on the front end panel, soon revealed the cause: dry-joints at pins 3 and 4 of CNP101. A quick resolder restored normal operation. **C.B.**

Sony HCD-CP333

This unit went to standby three-four seconds after being switched on – if you quickly pressed CD play however it would stay on. The cause of the trouble was the cassette mechanism, ref. 6, part no. 1-796-078-11. A replacement restored normal operation. **C.B.**

BMW car CD autochanger

This boot-mounted unit would sometimes work but more often "no disc" would be displayed at the head end despite a full complement of CDs being present in the CD 'cassette'. As a further irritation, when the fault was present it wasn't possible to eject the 'cassette'. The owner had in fact become quite adept at dismantling the unit and pressing the internal eject lever: he was very lucky not to have encountered a partially-loaded CD...

In this unit, and no doubt its contemporaries from other manufacturers, the loading mechanism is electrically insulated from the main chassis by nylon mountings that surround the lowering screw mechanism. All connectivity to the loading mechanism, laser unit etc. is therefore provided by a thin ribbon cable. Careful inspection revealed physical damage to the earthing conductor within this ribbon cable. As a result there was intermittent continuity and hence, more often than not, no operation. This damage appeared to have been present from new. Instead of replacing the whole ribbon cable I found that a permanent repair was possible by connecting a braided, flexible wire in parallel with the original earth connector. **D.I.S.**

Sony MHC-S9D

This mini component system was totally dead, with no display or front lights. Only a slight clicking sound could be heard from somewhere inside. You expect to find the cause of such a fault in the system's main unit, but on this occasion it was in the tuner. The tuner is *Model ST-S9*. It houses some regulators, one of which is on a separate heatsink with flying leads that connect it to the

main board. This regulator, IC991 (12V), had failed – it had been working so hard that it had cracked in half and was on the point of damaging the small PCB to which it is soldered. Fortunately the PCB could be cleaned up and a new 7812 regulator got things going again. **M.L.**

Aiwa AD3800

This three-head cassette deck would play for only a few seconds. On investigation I found that the idler for the tape counter/pulse generator for auto-stop had jammed. Freeing it solved the problem. But the motor had to be relocated as the mounting had come off one of the screws/rubber bushes. **P.R.**

Technics RS673

This unit wouldn't play cassettes. I found that the cassette-in switch wasn't making contact. Adjusting the lever cured that, but I then found that fast forward and rewind didn't work either. As the unit dates from 1978, the rubber idler wheels had hardened. Cleaning and putting more tension on the spring got them working again.

The deck then worked, but I thought that the solenoids should operate with a more solid clunk. Resoldering the power supply

and the solenoid PCB produced a more satisfying clunk. After that the unit produced excellent sound and worked really well. **P.R.**

Philips CD104

This CD player powered up but wouldn't play a disc. It was not surprising, as the pivot for the radial arm was almost solid. Loosening the arm so that it could move with negligible friction restored full operation. How it had got into this condition is open to speculation!

It was one of the first CD players made, with quirky Philips style, a diecast chassis and all-metal CD tray. None of the components gets hotter than slightly warm: compare this with modern players! **P.R.**

Quickies

Aiwa CXN999K music centre: For no display, check C107/8 (10 μ F, 50V) on the main PCB.

Sony HCD CMT-CP11 mini hi-fi: For no go, check the primary winding of the mains transformer T901. The Sony part no. is 1-435-386-11, the SEME part no. PTX6184.

JVC CA-D851TR: For no go check whether the mains transformer is open-circuit. **J.S.O.**

Test Case 497

Mr Fox was not a happy man. ITV digital had let him down, then ONdigital had done the same. With some help on the phone from our Colin Doc, he had managed to retune his receiver box for the Freeview transmissions. But it seemed that Freeview was also failing him now. Reception had been reasonably reliable until early this year. Of late however it had deteriorated badly. Very often the picture would break up and fall to pieces, while the sound crackled, popped and dropped out at the same time. The accompanying photo shows typical picture deterioration. BBC reception, while far from dependable, was better than that of ITV programmes. Mr Fox had tried reverting to analogue reception, but that seemed to have gone downhill as well – with patterning and lines, worse on some channels than others.

Quite by accident, Mr Fox discovered that his troubles were lessened when his VHS VCR was removed from the aerial link. Reception was somewhat better with the downlead plugged into the digibox directly, though it was still not as good as it had been originally. He borrowed a VCR from his good neighbour Bill to try it out in place of his own machine, but it didn't help at all. Neither could Bill himself, because he had had his terrestrial aerial removed when his satellite dish was installed. His Sky pictures were fine of course!

Colin Doc lent his customer a couple of coaxial attenuators to try. They made a difference but certainly didn't cure the problem, with or without the VCR in the path of the UHF signal. They made analogue reception even worse. No relief was provided by another of Colin Doc's suggestions, to try using a double-screened coaxial flylead.

It seemed then that the fault was in the receiver box itself – or was it perhaps to do with the aerial? The latter seemed more likely, because of the poor analogue reception. So who should Mr Fox call in – the local aerial rigger, the Radio Investigation Service, or our man Cathode Ray? What do you think was at the root of the trouble? For the solution, turn to page 443.





DVD and Home Cinema

Fault reports from
Chris Bowers
Geoff Darby
J.S. Ogilvie
Jon Talbot
Gary Laidler and
Dave Kerrod

We welcome fault reports from readers – payment for each fault is made after publication.

Reports can be sent by post to:

Television Magazine Fault Reports,
 Highbury Business,
 Media House,
 Azalea Drive, Swanley,
 Kent BR8 8HU

or e-mailed to:
 t.winford@highburybiz.com

Sony DAV-S550/HCD-S550

There was no switch operation with this unit. A look inside, at the front panel, revealed the cause of the problem: the space between the power switch and the front panel seemed to be insufficient. A call to Sony revealed that a new power subassembly would be needed. This restored normal power-switch operation.

This is also applicable to Model HCD-S880. C.B.

Sony DVP-NS905V

This unit was dead. Checks in the power supply revealed that IC101 was open-circuit. It should be replaced with the improved type MIP2E3DMY, part no. 9-885-030-35. Once this had been done there was normal operation. C.B.

Sony HCD-S550/DAV-S550

There was no audio output from the right-hand channel with Video 2 input. Investigation inside revealed that the red jack socket J206 on the IO board had been soldered without the centre pin being in place. The socket was removed, the pin was straightened then the socket was resoldered. This restored the right-hand channel audio output. C.B.

Sony HCD-SA30/DAV-SA30

When this silver-coloured unit was plugged into the mains supply it produced a very loud buzzing sound from within then switched to standby. The cause of the problem was the mains transformer T101, part no. 1-439-570-11. A replacement restored correct operation with normal sound. C.B.

Sony HCD-S550

This unit wouldn't load discs. The cause of the fault was gear L1, possibly

because of lack of grease. The worm gear had become abnormally worn. Normal loading was restored by fitting a new replacement gear and motor assembly (LD) plus application of a drop of the right grease, worked in by rotating the worm screw by hand to produce an even covering. C.B.

Sony DAV-S400/HCD-S400

The left-hand channel would cut off intermittently. A look around on the amplifier board revealed the cause, a dry-joint at L401. On closer inspection I found a number of other soon-to-be dry-joints on this panel, at L402-6, C300 (2,200µF, 35V) and connector CN309. Reliable operation was ensured by resoldering all these joints. C.B.

LG DA-350

The owner of this home-cinema system complained that it didn't read "any discs". This was not strictly true: it read CDs, but not DVDs or VCDs. If a DVD or VCD was loaded it would be spun up and correctly identified as 'DVD' in the display. The unit would then refuse to continue the reading process further, producing an on-screen message that said "stop, check disc".

The clue to the cause of this problem was the absence of colour on the logo screen. When I checked at the back of the unit I found a switch that was labelled 'Auto – NTSC – PAL'. It was set to NTSC. Apart from the fact that the unit was feeding an NTSC-encoded signal to the test monitor, hence the lack of colour, it expected any disc that was inserted to be in the NTSC format. Presumably its owner had set it to this incorrect mode in the hope that it would then play US NTSC discs, completely missing the point that in addition to a system mismatch with the TV set there was also the small matter of region identification.

All was well once the switch had been set back to PAL (auto would have been OK, but I prefer to force the machine to the correct standard for UK discs) and the unit had been de-powered then repowered to enable the new switch setting to be read by the system control microprocessor chip. G.D.

Panasonic DVD-RV31

Many engineers nowadays deride the use of an analogue test meter, especially when the one concerned is a big black hulk called an AVO 8. I'm a great believer in "horses for courses" however, and my good old 8 is still in daily use in the workshop – even with the most up-

to-date technology. This DVD player is an example of its advantages.

The reported problem was "H02 fault". This referred to the error message that appeared in the display. When any type of disc was inserted – CD, VCD or DVD – the eventual result was the error message followed by 'stop'. Careful observation of what was going on showed that the laser worked, focus-search was carried out and appeared to be successful, and the optical block shuffled. The disc failed to spin up, but there was sometimes a slight twitch from the motor.

The fact that no type of disc was read suggested to me that the laser was OK. While the pickup diodes are common for all types of disc, the light comes from two different laser diodes. In general it's much more common for these to fail or wear out than for problems to develop with the pickup diodes. This thinking led me to suspect that there was a fault on the MPEG board or a problem with the spindle motor or its drive.

Once I'd removed the deck it was clear that IC2501 on the PCB beneath was in some distress, being very hot. Amongst other things this IC drives the spindle motor. After unsoldering the connections to the spindle and sled motors, slackening the single screw and unplugging the laser I was able to remove the PCB. Enter the AVO! By setting it to the ohms/100 range – this is the lowest ohms range, and may be designated differently with other AVO models or other makes of meter – I was able to carry out what, over the years, has proved to be an almost foolproof test of this type of motor. I picked up the technique many years ago from a Pioneer technical bulletin, so all credit to that company for a very useful tip.

With the meter set as described above, apply it across the motor both ways. A healthy motor will always self-start and rotate slowly in either direction. At the same time a reading of about 5-7,000Ω, divided by 100 of course, will be shown on the meter scale. This reading should be quite steady when the motor is running, after the initial climb caused by the back-EMF effect. If the meter is stalled manually, the reading will drop to about 12Ω (1,200Ω indicated). With practice you can tell almost immediately whether or not the motor is good.

The technique can in most cases be used with the sled motor as well. The gearing between the motor and the sled itself is so low that the sled can normal-

ly be driven up and down its track by power supplied by the meter. You will soon see if there are any sticky mechanical spots or dead/poor commutator segments.

Overall this test will tell you much more about a motor's condition than connecting a 1.5V battery to it. A battery is capable of supplying virtually limitless current – in relation to the few mA that the motor normally draws – and in my experience will make most motors run, apparently without trouble, even when they won't run in the player.

In this case the motor didn't run under the current-limited AVO power, and produced abnormally low resistance readings. As a final check, I shot some switch cleaner into the holes by the brushgear at the back of the motor and subjected it to a few quick blasts of 12V in either direction. Normal readings were obtained after that, and the motor rotated under AVO power.

The motor was a standard long-spindled Matsumi type. A replacement restored the player to full working order with all types of disc. **G.D.**

Ferguson DVD400FE

This player had a very dim display and remained in standby. I checked the power supply and found two capacitors that looked a bit off colour, C807 and C810 (both 1,000μF, 10V). They read very low when checked with a meter. The machine worked fine once replacements had been fitted. Reposition D806 and D807 when doing this, so that they are kept away from C807 and C810, as I suspect that the diodes cook the capacitors. **J.S.O.**

Naiko N2001B

This player was brought in because it was dead. Checks in the power supply revealed the culprits: C10 (47μF, 16V) and C13 (68μF, 400V). Replacements brought the machine back to life. **J.S.O.**

Schneider HCS500

The complaint with this CD/DVD/MP3/home-cinema system was 'flashing'. The picture appeared and disappeared at about one-second intervals: after a few minutes the sync became ragged and the picture gradually slipped into Tate Modern mode.

There are two mains transformers inside the box. The smaller one supplies 13-0-13V to a 5V regulator (IC905) via a couple of rectifier diodes (D911-2). When the processor board comes into operation a relay is energised, switching in the second, larger transformer. The

5V supply was low and wobbly, while the smaller transformer was very hot. I switched off hastily and, not having a circuit diagram, explored the unit while things cooled down.

I guessed that the smaller transformer had a rating of about 10VA, and tested it with a dummy load. Then I fed the 5V regulator from a 12V bench power supply, drawing about 900mA. Supply and demand seemed to be barely compatible.

To remove the main PCB I disconnected the scart board, unplugged lots of fingernail-shattering nylon plugs, then unscrewed the back cover so that I could twist it and the PCB over. It's awkward: they don't have many Meccano boys east of Suez, and it shows.

Tracing along the tracks, I found that the smaller transformer is for start-up and standby only. When the larger one is switched in, the 5V regulator should be supplied from the main 12V rail via an isolating diode (D910). This is a 1N5401. Its thick-wire end had been cropped under the board with blunt cutters, over-straining the solder joint which had gone open-circuit. **J.T.**

Dansai DVD1010

This budget DVD player was dead. I made for the power supply, and the state of C17 (1,000μF, 10V) there gave me confidence. It was short-lived, as the unit remained dead after fitting a replacement. With no circuit diagram, all I could do was to get out the Avo and carry out some cold checks. I soon found that D8 (SR560) was short-circuit. This time the replacement restored normal operation. The customer was keen to have the unit repaired despite the low cost of new ones. Unusual these days. **G.L.**

Panasonic SADT300

There was no sound output from this DVD home-cinema system. Voltage checks showed that the +6V and -6V supplies were incorrect, and I then found that IC302 was short-circuit between pins 5 and 20. This IC is surrounded by other surface-mounted components, which I protected with Chemask. It's very effective. **D.K.**

Sony SLDV900

This is a VCR/DVD combi unit. The DVD player section would sometimes freeze the picture and stop altogether. A replacement sled/feed motor, part no. 1-796-537-11, cured the fault. The original one had a dead spot. **D.K.**



VCR CLINIC

Reports from
Eugene Trundle
Michael Dranfield
Bob Flynn
L. Gare
and
Martin McCluskey

We welcome fault reports from readers – payment for each fault is made after publication.

Reports can be sent by post to:

Television Magazine Fault Reports,
Highbury Business,
Media House,
Azalea Drive, Swanley, Kent BR8 8HU

or e-mailed to:
t.winford@highburybiz.com

Sony EV-S9000E

This huge and elaborate Hi-8 VCR wouldn't switch on. Whenever it was powered however the red power indicator flashed on and off. Normal operation was restored once the electrolytic capacitors CO12, CO17 and CO18 on the primary side of the power supply had been replaced. **E.T.**

Panasonic NVFJ620

There was a cassette trapped in this machine, which stayed in the stop mode and shut down whenever any deck function was requested. I saw that the capstan failed to turn, and replaced the motor after checking its supply voltage and control line. This brought the deck back to life. I noticed that a couple of surface-mounted components on the old motor had overheated badly. **E.T.**

Toshiba V642UK

I've had this fault many times now: no picture, just snow, like a dirty video head. A check at the video-envelope test point will reveal that head switching is taking place at the wrong point. The cause of the fault is a corrupted EEPROM. Reprogramming it will provide a temporary cure. For a lasting cure you have to replace the microcontroller chip IC601 with an improved type, part no. BY631197. Although this machine is made by Samsung it is necessary to obtain the correct service manual for this model as the option codes are different.

The fault also occurs with Models **V632UK, V652UK, V752UK and V852UK. M.D.**

Daewoo GB14F7T1

The customer who brought this TV-video combi unit in said the heads needed cleaning. When I did this there was some improvement, but the drum speed was hunting and the picture was covered with interference lines. The cause of the problem was ripple on the supplies to the video section. I found that the following capacitors were all very low in value: C826 and C836 (both 100µF, 25V) which are connected to the 12V rail 1; C832 and C833 (both 1,000µF, 16V) which are connected to the 12V rail 2; and C822 (1,000µF, 16V) which is connected to the 8V rail. **M.D.**

Sony SLVE700 (H mechanism)

There was no front display, no output from the RF socket, and a playback picture but no sound from the scart socket. The cause had to be a power-circuit fault, and was. L181 (10µH) was open-circuit. **B.F.**

Toshiba V109B

This old-timer was in pristine condition and performed perfectly until asked to wind or rewind. It would then make weird mechani-

cal movements and give up. With no obvious cause, suspicion fell on the mode switch. It's underneath the deck and is of a type that cannot be dismantled to clean. A replacement cured the fault. It is available from SEME under part code SW678. **B.F.**

Sanyo VHR130E

The brakes sometimes wouldn't release. I found that the brake cam slide pin on the slide mechanism near the mode switch was sticking. A clean up and a drop of oil cured the fault. **L.G.**

Orion D4500

There was no E-E operation. Checks revealed that there was no AGC voltage at pin 3 of IC6001 – the voltage here should be 7.1V. Surface-mounted capacitor C6009 (0.01µF) had a 500kΩ leak. **L.G.**

Amstrad TVR2

There was no playback picture, just snow. It looked as if the heads were faulty. I found that there was no 5V playback supply at IC1 (AN331) though the supply was present at pin 1 of connector CL4. Tracing along the print I came to L9 which was open-circuit. **L.G.**

Amstrad VCR4600

This machine had been in working order when stored in a loft ten years previously. The elderly owner was surprised when he tried it and found that it wouldn't play! Unlike a modern VCR, access to the deck mechanics is simply a matter of removing the metal base plate. I soon discovered that the small, flat loading belt was slipping. Even though the machine is nearly twenty years old, a complete belt kit is available for under £3. The machine gave first-class results when the new belts had been fitted. **M.McC.**

Daewoo GB14H1N

This TV/VCR combi unit had a head-cleaning cassette stuck inside. Once I had removed it manually I worked out what had caused the problem. After accepting a cassette the brakes are applied to the take-up hub and the loading arms pull tape from the supply reel. However the cleaning tape was at the end of its travel. So the loading arms had struggled to pull out tape, returned, then tried again and again. This wouldn't have happened with a videocassette, as the clear tape would have activated the end sensors. A soak test proved that no faults were present, and I advised the customer not to use this type of cassette in his machine.

Unusually for a combi unit, this one is a delight to work on. The VCR mechanism can be powered up and watched with the chassis out of the cabinet. **M.McC.**

All year round Spares are part of your business....

Let us make it
our business to help you.

Ring Mike today on...

0114 273 9622



- ✓ Run by T.V. engineers for T.V. Engineers.
- ✓ You speak to experienced engineers with in-depth knowledge of TV/Video trade.
- ✓ CLASSIC® distributors and trade counter.
- ✓ We stock parts that engineers advise us to stock, with regular updates.
- ✓ Free or low £1.00 p&p on orders means:
**YOU CAN EASILY AFFORD TO ORDER
MORE THAN ONCE A DAY!!!**

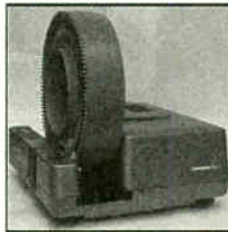


IrwinElectronics

"The television engineer's wholesaler"
Online you can order at www.IrwinElectronics.co.uk

WATCH SLIDES ON TV MAKE VIDEOS OF YOUR SLIDES DIGITISE YOUR SLIDES

(using a video capture card)



"Liesgang diatv" automatic slide viewer with built in high quality colour TV camera. It has a composite video output to a phono plug (SCART & BNC adaptors are available). They are in very good condition with few signs of use. For further details see www.diatv.co.uk

.....£91.91 + vat = £108.00

Board cameras all with 512x582 pixels 8.5mm 1/3 inch sensor and composite video out. All need to be housed in your own enclosure and have fragile exposed surface mount parts. They all require a power supply of between 10 and 12v DC 150mA.

47MIR size 80x36x27mm with 6 infra red LEDs (gives the same illumination as a small torch but is not visible to the human eye).....£37.00 + vat = £43.48

30MP size 32x32x14mm spy camera with a fixed focus pin hole lens for hiding behind a very small hole.....£35.00 + vat = £41.13

40MC size 39x38x27mm camera for 'C' mount lens these give a much sharper image than with the smaller lenses.....£32.00 + vat = £37.60

Economy C mount lenses all fixed focus & fixed iris

VSL1220F 12mm F1.6 12x15 degrees viewing angle.....£15.97 + vat = £18.76

VSL4022F 4mm F1.22 63x47 degrees viewing angle.....£17.85 + vat = £20.74

VSL6022F 6mm F1.22 42x32 degrees viewing angle.....£19.05 + vat = £22.38

VSL8020F 8mm F1.22 32x24 degrees viewing angle.....£19.90 + vat = £23.38

Better quality C Mount lenses

VSL1614F 18mm F1.6 30x24 degrees viewing angle.....£26.43 + vat = £31.06

VWL813M 8mm F1.3 with iris 56x42 degrees viewing angle.....£77.45 + vat = £91.00

1206 surface mount resistors E12 values 10 ohm to 1M ohm 100 of 1 value £1.00 + vat

1000 of 1 value £5.00 + vat

866 battery pack originally intended to be used with an orbital

mobile telephone it contains 10 1.6Ah sub C batteries

(42x22dia the size usually used in cordless screwdrivers etc.)

the pack is new and unused and can be broken open quite

easily.....£7.48 + vat = £8.77



Please add 1.66 + vat = £1.95 postage & packing per order

JPG ELECTRONICS

Shaws Row, Old Road, Chesterfield, S40 2RB

Tel 01246 211202 Fax 01246 550959 Mastercard/Visa/Switch

Callers welcome 9:30 a.m. to 5:30 p.m. Monday to Saturday

P.J.HILL

TV. VCR. SPARES FLYBACK TRANSFORMERS BY ELDOR, OREGA, TERMAL, CLASSIC ALSO BUDGET RANGE.

Enquire by No's off old transformer & model No. For Akai, Akora, Alba, Aiwa, Bush, Beko, Daewoo, Ferguson, Formentii, Goodmans, Grundig, Hinari, ITT, JVC, Matsui, Net, Orion, Panasonic, Philips, Samsung, Sanyo, SEG, Sharp, Sony, Thomson, Tatung, Toshiba, etc

REMOTE CONTROL BY CLASSIC

Video heads & spares, CD Lasers, belts, mains switches, semi conductors, valves, switch mode transformers (including Matsui 2196N) service kits, T/V, VCR & satellite resistors, capacitors, valves, tuners, triplers etc.

ASK ABOUT OUR SERVICE MANUAL LIBRARY
FOR TV VIDEO & MICROWAVE & AUDIO.

MOST CREDIT & DEBIT CARDS

P.J.HILL

classic

DISTRIBUTOR

**E7 NORTHWAY TRADING EST,
NORTHWAY LANE, TEWKESBURY,
GLOS, GL20 8JH,
TEL: 01684 296902
FAX: 01684 294317**

inStore
ELECTRICS LIMITED

171 HAREHILLS LANE, LEEDS LS8 3QE
Tel: 0113 240 1114. Tel/Fax: 0113 240 7275.
Mobile: 07976 403134
Email: sales@instoreleeds.freemove.co.uk

MANUFACTURES GRADED PRODUCTS ALL PRICES PLUS VAT: ALL PRODUCTS FULLY GUARANTEED

*
PHILIPS 32PW6517 32" WIDESCREEN REAL FLAT,
FM RADIO, 50HZ **£319.00**

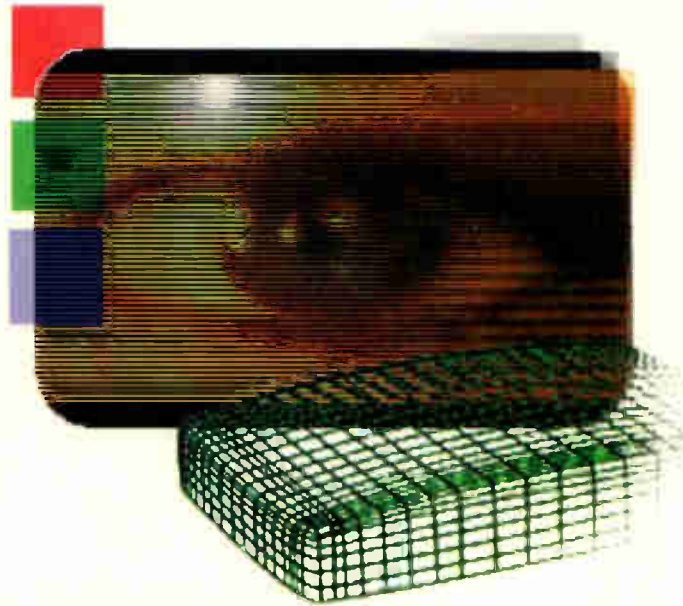
*
PHILIPS 32PW9308 32" WIDESCREEN REAL FLAT,
DOLBY, 100HZ, PIXEL PLUS **£449.00**

*
PHILIPS LX3000 DVD PLAYER 5.1 SURROUND
SOUND SYSTEM, 200W RMS **£139.00**

*
PHILIPS 14" TV/VCR COMBI FROM **£84.00**
PHILIPS 14" PORTABLES FROM **£54.00**

*
PHILIPS VCR'S FROM **£39.00**
PHILIPS AUDIO SYSTEMS FROM **£44.00**

*
**FURTHER OFFERS AVAILABLE
PLEASE CALL FOR A PRICE LIST
CREDIT CARDS WELCOME: NEXT DAY DELIVERY**



TV FAULT FINDING

Reports from
Michael Dranfield
Philip Salkeld
Martyn S. Davis
Eugene Trundle
Martin McCluskey
Phil Cooke
 and
Steve Hague

We welcome fault reports from readers – payment for each fault is made after publication.

Reports can be sent by post to:

Television Magazine Fault Reports,
 Highbury Business,
 Media House,
 Azalea Drive, Swanley,
 Kent BR8 8HU

or e-mailed to:
 t.winford@highburybiz.com

Daewoo 20V1

This newish set had very non-linear field scanning and compression. I found that there were lots of dry-joints and high-ESR electrolytic capacitors around the TDA1771 field output chip, but attending to these and fitting a new chip failed to cure the problem. After drawing a blank, I had to order a service manual. Armed with this and a scope I found that the field ramp pulse was missing at pin 6 of the TDA1771 chip. Incidentally it's incorrectly labelled as "screen" instead of "saw-tooth" in the manual. I then found that the field ramp charging capacitor C305 (0.047µF Mylar) was open-circuit. A replacement cured the problem, but I hate having to buy a service manual for a one-off job! M.D.

Bush WS6674 (11AK37 chassis)

If one of these sets is dead with the mains bridge rectifier's reservoir fully charged after switch off, replace RP06 (3.9MΩ) in the power supply. M.D.

Sony KV25X5U (FE1 chassis)

This set was tripping because its line output transistor was short-circuit. I checked for a possible cause of the transistor's failure and found dry-joints at the line driver transformer. The price of the original 2SD2539 Sony transistor came as a bit of a shock at £20 + VAT. So I looked in the equivalents book and saw that the 2SC4769 is listed as an alternative.

Grandata came to the rescue with this one at only £2.20 + VAT. M.D.

Samsung T1-14N3

This 14in. TV-video combi unit was still under guarantee, but Argos didn't want to know as the owner couldn't find his receipt. The picture was shifted to one side, with line foldover. I suspected a crack in the print that carries the line feedback pulse, but was wrong about this. As soon as I removed the back I saw that R410 (3.9kΩ) was burnt to a crisp. Fig. 1 shows the relevant circuitry. I suspected that the blue disc capacitor CR404 was leaky, so I replaced it along with R410 and switched on. R410 then burn up straight away. The 5.6V zener diode DZ401 proved to be OK when checked with a zener tester. This left CR405.

The penny then dropped. CR404 and CR405 form an AC potential divider to pot down the line flyback pulse at the collector of the output transistor. CR405 was open-circuit, so the full-amplitude pulse was effectively applied to DZ401 via CR404. Fortunately no other damage had been done. M.D.

Sharp 76FW-53H (DA100 chassis)

There was no sound output from one channel. I found that the voltage at mute pin 12 of IC301 (TDA7480) was low. Q305, C362, R350 and R351 in the mute control circuit were all OK. I then desoldered pin 12 and found that there was a low reading to chassis. A new TDA7480 chip cured the fault. M.D.

Toshiba 2812DB

There were two faults with this set, poor field linearity and severe EW distortion, both from cold. The field scan fault was caused by C317 (2.2µF, 50V). It's impossible to get at this component without first unsoldering the EW correction PCB, as it sits underneath. The EW problem was caused by another 2.2µF, 50V capacitor, C372. This is mounted on the EW correction PCB, so either way you will have to unsolder it. M.D.

Goodmans GTV211

This set's fault symptom was serrated verticals. As I had no circuit diagram I decided to feel around for hot components and found that C25 (47µF, 160V) was getting extremely hot. A replacement rated at 250V cured the fault. P.S.

Bush WS6673 (11AK19 chassis)

The green LED glowed but there were no other signs of life. Checks inside revealed that the HT was correct at 145V and the LT voltages at the secondary side of the

power supply were present. I came to the conclusion that there was no line drive, which was confirmed by a scope check at the base of the line driver transistor. It comes from pin 40 of the TDA8844 chip IC401, and was missing here as well. A check at pins 12 and 37 of IC401 showed that its 8V supply was missing. This brought me to the 8V regulator IC805, which was the cause of the trouble. A replacement from a scrap chassis brought the set back to life. **P.S.**

Sharp 28HW-53H (DA50W chassis)

Field collapse was the problem with this set. The field timebase looks very complicated, so I decided to start at the TDA7480 output chip IC501, which should have a 13V supply at pin 16 and a -13V supply at pin 17. The negative supply was missing. It comes from D608/F601, which are fed from the line output transformer, and was present there. But it was not present at L503, which supplies the IC. There was a break in the print, so a hard-wire job was required. This solved the problem. We're getting a lot of Sharp sets for repair at present. **P.S.**

Philips 28PW6006/05 (101.1E AA chassis)

There was field foldover at the top of the screen. I ordered a TDA8359J field output chip (part no. 9352 7016 4112) without a lot of hope and, when it had been fitted, was not surprised to find that the fault was still present. The next step was a call to Philips technical. I was told to replace the two 1nF surface-mounted capacitors C2252/3. Spot on! Doing so restored correct picture geometry. **P.S.**

Sharp 32JW-73H (GA20 chassis)

The more of these sets that come in, the more I dislike them. This one was totally dead, with no LED display or tripping noises. As usual my first check was at the mains bridge rectifier's reservoir capacitor C715, where the correct 330V was present. The circuit diagrams are now on A4 sheets of paper, which makes fault-finding quite a problem. Somehow, the 330V arrives at pin 8 of the chopper chip IC701. One of the outputs, at pin 1, produced a reading of less than 1V instead of 12V. In the interest of doing something, I decided to order a replacement IC (part no. WHITEA1507/-1). I was more than pleased that it restored normal operation - it's a complex power supply arrangement. **P.S.**

Sanyo C28WN1B

This widescreen set came in on Christmas

Eve as a rush job. It was stuck in standby. My first check was at the base of the chopper transistor Q634, where a reading of 0V was found. There should be a start-up/bias feed here, via R645/647 (both 120k Ω , 0.5W). R645 was open-circuit. I replaced both resistors with ones rated at 1W, and was surprised to find Sanyo using a network that's been in use for many years. **P.S.**

Grundig 28XKC

We don't get many Grundig products in the workshop. This one had lines across the screen, like the old microphonic field output valve if you can remember that far back! Replacement of the TDA8358J field output IC cured the problem. This expensive chip is available from SEME. **P.S.**

Hitachi C32W40DTN

There was an apparently nasty fault with this combined digital/analogue set: a snowy blank raster, while any attempt to access anything resulted in the on-screen menu "doing its own thing". The solution was to connect the digital RF cable to the analogue input, connect the main aerial lead to the digibox input, then go into the service mode and carry out 'E2 shipping', known as the 'shipping reset'. First hold down the remote-control unit's menu button then, with your second and third hands, hold down the volume up and down buttons at the front of the set. After a while a refreshed menu appears, with the service mode option. Enter the service mode, scroll down to 'E2 settings', highlight 'E2 shipping' and select this. The set immediately goes to standby. Switch the set off then on again. It comes on in the 'virgin' mode, allowing you to auto-tune from scratch. Fortunately this cured the fault - my thanks to Hitachi technical for the information.

Apparently you will get no analogue signal either should the digibox pack up. You can check for this by connecting an AV input from a DVD player.

Never initiate the 'E2 factory' mode - this is non-recoverable! **M.S.D.**

Philips 28PW6332 (MD1.2E chassis)

This set kept coming back to the workshop with no sound, and I kept replacing the main audio IC and 5A fuse. The set is fitted with external speaker connections, so I came to the conclusion that the owner had been miswiring the speakers. After the set's third appearance in the workshop I cut the PCB track to the rear speaker terminals to prevent any such misuse. It wasn't until the set's fourth appearance that I found the real cause:

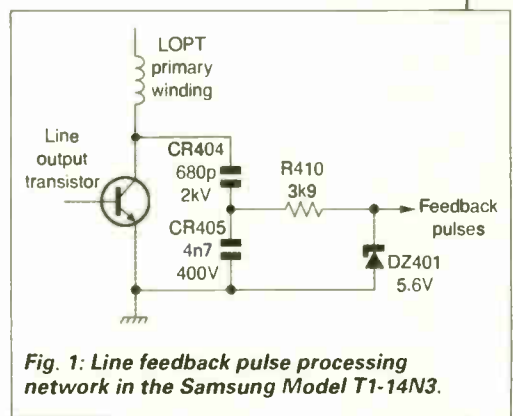


Fig. 1: Line feedback pulse processing network in the Samsung Model T1-14N3.

one of the internal 'horn' speakers was going short-circuit intermittently!

I replaced the speakers and left my little modification in place. I sincerely hope I never see that particular set again! **M.S.D.**

Toshiba 36ZD26P

This newish set had several odd and apparently unconnected faults. There was no sound, though the volume display worked: various on-screen graphics were present when they shouldn't have been; and the brightness took a while to come up. My thanks to Toshiba technical for help with this one. Transistor QB30 (2SC1815Y) on the power supply board can become leaky, affecting the 4.9V reset line. The part no. is 23114433. Toshiba recommends adding an 0.1 μ F, 50V capacitor across the transistor's base-emitter junction to help prevent the problem. **M.S.D.**

Philips 29PT66773/05 (MD1.2 chassis)

There was complete loss of sound and vision, but a slight burning smell provided a clue. I found a burn mark on C2433 (1.5nF) in the line output stage. No other damage was apparent, and a replacement restored normal operation. After that the set was given a long soak test. **E.T.**

Matsui 20V1R (CUC7307 chassis)

A frequent cause of no action apart from a flashing front-panel LED is C667 in the power supply. A replacement fitted in this set restored the HT supply only to reveal a faulty line output transformer, with brown gunge oozing from it. A new transformer restored normal operation. **E.T.**

Bush 6690D

This was one of the first IDTV sets, dating from 1997. Virtually all the PCB joints to the scart socket were broken, so there was no response to signals applied

here. After resoldering, I drilled a couple of holes in the cabinet back cover and fitted retaining screws into the socket fixing holes. If you do this, use spacers between the cabinet and socket and take care that the screws are not long enough to touch the nearby metal heatsink. E.T.

Tatung E series chassis

Very intermittently, maybe once a week, the sound volume increased to maximum, along with an on-screen indication, as if someone had keyed the remote-control unit. The cure was to remove XL701 and XL301 on the motherboard and XL601 on the Nicam board, scrape their legs, then retin and resolder them. E.T.

Sony KV24LS35U (FE2 chassis)

The complaint with this quite new set was that it didn't capture any stations in the self-seek mode. I found that the picture I tuned in was a pulsating mass of lines, as if the set was working on the wrong transmission standard. When the 'technician menu' was called up I discovered that some settings were incorrect, also that in the self-diagnostic display the tuner failed to answer when the control chip called its name, as it were. Normality was restored by fitting a new tuner and some software reprogramming. E.T.

Daewoo T514 (CP365 chassis)

This set reverted to standby immediately after being switched on. I found a big, ragged waveform across C414 (33 μ F, 160V), which is connected to pin 4 of the line output transformer – it acts as the boost reservoir capacitor. A replacement cured the problem. E.T.

Hitachi C2556TN

This set was 'dead', though a ticking sound came from the power supply. There was also a burning smell, which came from the line output area of the PCB. The cause of the fault was very simple: disc capacitor C707 (1nF, 2kV) was leaky. M.McC.

Bush 2071NTX (11AK19 chassis)

When an attempt was made to bring this set out of standby it remained 'dead' and the LED went out. In addition the HT was low at 70V, and the other power supply outputs were also very low. Much time was wasted looking for overloads and checking the circuitry around the MC44064 power supply control IC before I discovered that the HT reservoir capacitor C829 (47 μ F, 160V) was open-circuit. How this resulted in the other secondary-side voltages being low is a bit of a mystery – it was possibly caused by the

action of the feedback regulation circuit. M.McC.

Mitsubishi CT29A4STX (Euro 12 chassis)

The picture this huge grey 29in. monster produced was bowed at the top and the bottom, and none of the controls on the raster-correction panel had any effect. Correct geometry was restored by replacing Q409 (2SA950) on this panel. A BC640 is suitable in this position. M.McC.

Sanyo 14MT1

The usual cause of a dead set is one of the 120k Ω start-up resistors R320 and R321 being open-circuit. Watch out for the charged mains rectifier reservoir capacitor! The complaint with this one however was stuck in standby. Its power supply was running in the standby mode with an HT output of approximately 78V.

I found that the 5V supply was missing at the microcontroller chip IC701, though it was present at the output of the regulator IC350. So I followed the printed track back via link J172 and came to a small, corroded blob of something on the board. When this was scraped away the print was found to be open-circuit. Print repair restored normal operation. M.McC.

Toshiba 2577DB

There was reduced height with the bottom of the picture folded over and a bright line across the centre of the screen. I found that rectifier diode D301, which produces the 26V supply for pin 3 of the field output IC, was dry-jointed. M.McC.

Bush Internet TV, Model ITV2100

The picture would go very bright with flyback lines. I found that R709 on the tube base panel was burnt. Fortunately an identical set was in for repair, so I was able to find the correct value from this one. A new 2.2k Ω resistor cured the problem. M.McC.

Hitachi C2514TE

At switch on there was a click from the speaker then the set reverted to standby. These sets incorporate an electronic trip circuit that holds the set in standby should the line output stage draw excessive current or the HT be too high.

In this case the cause of the fault was the TA8427K field output IC – its 26V supply is derived from the line output stage, and no safety resistor is fitted. This was not the end of the story however: C605 (100 μ F, 35V) also had to be replaced to cure top foldover.

Note that the C2514TE does not use

the same circuit as Model C2514T. M.McC.

Ferguson TX91 chassis

There were intermittent white flashes all over the screen, with crackling. It gave the impression of being caused by a tuner problem or an IF dry-joint, especially as tapping around seemed to make it come and go. After much resoldering however, and trying a new tuner, the fault was still present. Tapping under the tuner seemed to make it worse. The cause was eventually traced to transistor TH03 (BC858B). P.C.

Goodmans TVC201T

The customer said this set had been working perfectly until it was unplugged and moved to another house. It was now apparently tripping. When I switched it on the relay started chattering, along with the red and green LEDs. I couldn't find any shorts, cracks or dry-joints. As the set had probably spent most of its life either switched on or in standby, I decided to check all the electrolytics and high-value resistors in the power supply. This proved to be fruitless. The next step was to use the hairdryer, which got the set going. Use of freezer suggested that the TOP210 chopper device 1807 was faulty, but a replacement made no difference. Something in the vicinity was obviously playing up. Although it read OK with my tester, I decided to replace C840 (47 μ F). This restored normal operation. It just shows that you should sometimes go with your instincts! P.C.

Bush 1478TSIL (11AK36 chassis)

This fairly new 14in. portable is fitted with yet another Vestel chassis. The complaint was intermittently dead, a symptom that was eventually instigated by flexing the PCB. It was obvious that the commendably simple power supply was shutting down, and it didn't take long to find that C807 (2.2nF, 250V) had been soldered in at only one end. Resoldering put matters right. S.H.

Sanyo CE28WP3

We knew what we were going to find before we took the back off this just out of guarantee widescreen set. The report said that the screen had been going bright green intermittently, and that the set now refused to come out of standby. The line output transistor was short-circuit, a replacement restoring operation. Then, as usual, tapping the Philips tube instigated the green-screen fault. The customer contacted Sanyo, who agreed to supply a new tube free of charge. S.H.

atlas LCR

£79

Passive Component Analyser

(Model LCR40)

fully inclusive UK price

Just clip on the test leads and press test. The Atlas LCR will automatically identify the type of component, apply the appropriate test level and frequency, display the component's value and more!

Probes are detachable too, so you can use the optional SMD tweezers for your tiny unmarked passives - fantastic.



- Inductance range: 1µH to 10H
- Capacitance range: 1pF to 10,000µF
- Resistance range: 1Ω to 2MΩ
- Basic accuracy: 1%
- Test signals: 1V, 3mA max



"Astonishingly, this little unit seems to pack most of the punch of a large and very expensive automated LCR bridge into its tiny case."

See the full review on our website!

Andy Flind - EPE Magazine March 2003

Accessories:

- Carry case
 - Tweezer Probes
 - Crocodile Probe Set
 - Large Grabber Probes
- (more available soon)

atlas DCA

£60

Semiconductor Analyser

(Model DCA55)

fully inclusive UK price

NOW MEASURES TRANSISTOR LEAKAGE



Check and identify your semi's

- Automatic component identification
- Pinout identification
- Transistor gain measurement
- MOSFET gate threshold measurement
- PN junction characteristics measurement
- Shorted Junction identification
- Transistor leakage measurement
- Just connect the part anyway round and press the button!
- Auto power on/off

- Bipolar transistors,
- Darlington transistors,
- Diode protected transistors,
- Resistor shunted transistors,
- Enhancement mode MOSFETs,
- Depletion mode MOSFETs,
- Junction FETs,
- Low power triacs and thyristors,
- Diodes and diode networks,
- LEDs (+bicolours)

"It's the kind of instrument that should be on every engineers and enthusiasts bench."

EPE Magazine March 2000

atlas PACK £129!

LCR40 and DCA55 Pack

fully inclusive UK price

Why not order both analysers at the same time and take advantage of our special offer, saving you £10!



Visit www.peakelec.co.uk to download the data sheets, user guides and copies of independent reviews. You can pay using a cheque, postal order, credit or debit card and even pay securely online. Please contact us for your volume requirements.

Also available from Farnell, Maplin, Rapid and CPC (prices vary)

PEAK
electronic design ltd

Atlas House, Kiln Lane
Harpur Ind. Est., Buxton
Derbyshire, SK17 9JL, UK

Tel. 01298 70012

www.peakelec.co.uk
sales@peakelec.co.uk

Fax. 01298 70046





Extended Fault Reports

Reports on complex or tricky TV fault conditions are sometimes too long for inclusion in our regular fault-finding section. We've put a few of them together in this extended fault report feature

**Reports from
Mike Leach
Arthur Jackson
Bill Bolam
and
David I. Scott**

Sony KV24LS35U (FE2 chassis)

Don't you just love modern self-diagnostic systems? Personally I prefer the old approach: look for the glowing wirewound dropper section and dripping waxed capacitors! This dead Sony set did none of that. Instead the front LED would flash eleven times, which indicates the loss or reduction of the 8V supply. I made the mistake of taking this error code at its face

Fault

value. As a result I chased around for some ten minutes, checking the 8V regulator etc., before I realised that the main power supply had failed totally. The clue was the fact that there was no initial EHT rustle at switch on. There was also no inking whatsoever of voltage at the input to the 8V regulator.

The cause of the trouble turned out to be very basic: the two FETs (Q606 and Q607) in the main power supply had failed, also the associated surge resistor R603 (0.1Ω). The sub power supply was working all right, as the microcontroller chip was detecting the loss of the 8V supply. If the damn light hadn't been flashing I would have got to the cause of the fault in half the time! Never mind, on to the next one. M.L.

Philips 28PW6005 (A10E chassis)

The owner of this set gave me an accurate description of the fault symptoms. Apparently the picture size had for some time been erratic overall, there was intermittent colour, there were ragged edges to the picture and, finally, all tuning had been lost and retuning was not possible. A raster appeared when I tested the set, but when the menu was selected the geometry was badly out and UK was not available in the installation menu. I checked the option codes in the service alignment mode and found that all settings were incorrect. When the options had been reset and the geometry etc. had been realigned a perfect picture returned for a short time. Then the original symptoms as described above started to appear.

I recognised these symptoms from the time when the resistor encapsulated in the EHT cap in older Philips models would go open, causing EHT variations. The cause this time was similar.

The EHT lead had never been pushed into the transformer fully, and was badly blackened and burnt from arcing. This was clearly corrupting the EEPROM. I cut back the lead tip, cleaned it and refitted it into the transformer. After that the set was OK. A.J.

Thomson 28WF45E (ICC20 chassis)

The problems with this superflat, widescreen set were unusual. It usually started all right but switched to standby with a scene change. Then, after two restart attempts, it would display error code 25 in the usual Thomson manner, i.e. two flashes from the red LED, a delay, then five flashes from the LED. If the set did manage to run, the same fault symptoms would occur when teletext was requested.

According to the manual error code 25 means that the switched 5V supply is not available. This was confusing and led me nowhere. I spoke to Thomson technical who confirmed some reports of EW problems, particularly around the diode modulator stage, causing error 25 to be indicated. Cold checks failed to reveal anything amiss here, but capacitor CL033 (510nF, 250V) looked slightly bulged. Much to my relief, a replacement cured the fault.

To my amazement an identical set arrived in the workshop the following day. It didn't manage to switch on at all, and displayed error 25. Once again CL033 read OK when tested but a replacement cured the fault. Do modern sets incorporate too much protection? A.J.

Philips 21PT1666/05 (L01.2E chassis)

A couple of these 21in. mono-sound sets have failed while under warranty, with the complaint sound but no picture. EHT was heard at switch on, but the screen remained black. Checks showed that there was no A1/G2 or focus voltage at the tube base panel. This was still so with all the decouplers, spark gaps etc. isolated. In both cases the cause of the trouble was some type of unusual failure within the line output transformer (circuit reference 5445, part no. 4822 140 10669).

A word of warning about repair. When I fitted the first replacement transformer I got the following symptoms: no sound, all channels lost, and all colour, brightness etc. settings at minimum. The set kept switching to standby when I attempted to tune in and store again. A check on the clock and data lines showed that they were low and pulsing. I couldn't understand why, as the set had produced sound with the faulty transformer. Any components connected to the clock and data lines

should now be faulty.

I started to look for a man-made fault, which in fact was mine. It was cured simply by plugging the speaker into its correct black socket (0246) instead of the compair diagnostic socket (0217) which is white. I should have noted the colour difference, but the sockets are close enough for the speaker lead to reach comfortably. It would have been preferable for there to be some physical difference as well. **A.J.**

Tatung/Decca 32WT92 (PT92 chassis)

The front red LED was on but the set wouldn't come out of standby. Checks on the secondary side of the power supply showed that the outputs were OK, but the 145V supply was missing at the BU2508AF line output transistor. The cause was a blob of glue at pin 1 of the line output transformer. Once this pin had been cleaned and resoldered the set was OK.

This chassis is found in a number of models in different brand ranges, including the **Akura AVTV28WSS, Bush WS6667, Matsui 28N03 and Wharfedale CTV550S. B.B.**

Goodmans W288NS (F16 chassis)

The owner was none too pleased with this four-year old set. It had already been repaired twice elsewhere, and had now gone wrong again. The owner said his set was dead, but I could hear signs of life from the power supply at initial power up. A look inside revealed that lots of new components, mainly capacitors, had been fitted in the power supply. I could well understand the owner's displeasure at what had, no doubt, been expensive repairs previously.

Checks showed that the S2055N line output transistor was very leaky between all its terminals. I removed it and connected a 60W bulb and voltmeter across the HT line. When I switched the set on, the bulb glowed at half brightness and the HT was stable. So I was reasonably confident that the power supply had not been the cause of the line output transistor's failure.

I turned my attention to the line output stage, where the soldering quality appeared to be at its worst. The output transformer's joints were suspect and were remade, but the real culprit turned out to be C134 in the diode modulator circuit: it was completely dry-jointed at one end, and the lead looked somewhat tarnished. So, to forestall further trouble, I removed all the capacitors in this area and cleaned and retinned their leads

before replacing them in the PCB.

A new line output transistor completed the repair. This was followed by a lengthy soak test, which proved that it had been successful. I couldn't help but notice however that the Italian-made CRT was past its best. **D.I.S.**

Hitachi CPT2508 (G7P Mk II chassis)

I got off to a bad start while moving this rather heavy old set, as one of its side-mounted loudspeakers fell off! Fortunately no damage was sustained. The reported fault was no operation, and initial checks showed that the 2.5AT mains fuse F901 was blackened and open-circuit. So was the 3.9Ω, 7W surge-limiter resistor R901. Some leakage was apparent downstream from R901, and this brought me to C928 (2.2nF, 1kV) whose casing was split because of an internal burn-up. It's connected in parallel with the chopper transistor Q901. I replaced C928, along with F901, R901 and the adjacent capacitor C919 (4.7nF, 2kV) in the snubber network – it was showing similar signs of distress. At switch on the fuse held, but the set still didn't work. Correct operation was restored by replacing the BUT11A chopper transistor Q901 and the TDA4601 control chip IC901.

Numerous suspect solder joints were then attended to. These were mainly around the chopper and line output transformers but also included R914 in the snubber network where, incredibly, one end had parted company with the track altogether. This could have contributed to the failure of C928, C919 and Q901.

The chassis was then fixed back into the case. I applied power before screwing the back on, but once again F901 ruptured. This time the cause was a faulty degaussing thermistor. Why hadn't it shown up before? Because I had been operating the set with the chassis outside the cabinet. This necessitated disconnection of the degaussing coils, so the fault had been obscured. Once a new posistor (TH901) had been fitted the set worked extremely well considering its age. **D.I.S.**

Bush 2850NTX/A

Two faults had been reported with this set. There had apparently been small but irritating colour changes for some time. These had worsened to the point where the picture had taken on a greenish tint most of the time. The situation had been tolerated, no doubt in the interests of economy, until the set had stopped altogether.

Operation was restored once the mains on/off switch had been replaced. The pic-

ture then appeared to be quite good for about half an hour, after which it started to flash green. So something wasn't right with the green drive circuitry. Gently tapping the PCBs with a piece of wood revealed that the cause of the problem was somewhere on the CRT's base panel. As nothing obvious could be seen, I decided that the easiest approach would be to carry out a blanket resoldering of all the joints on this panel. Some care was required, because a mix of through-hole and surface-mounted components is used. But, once the work had been completed, there was a stable, correctly-coloured picture. **D.I.S.**

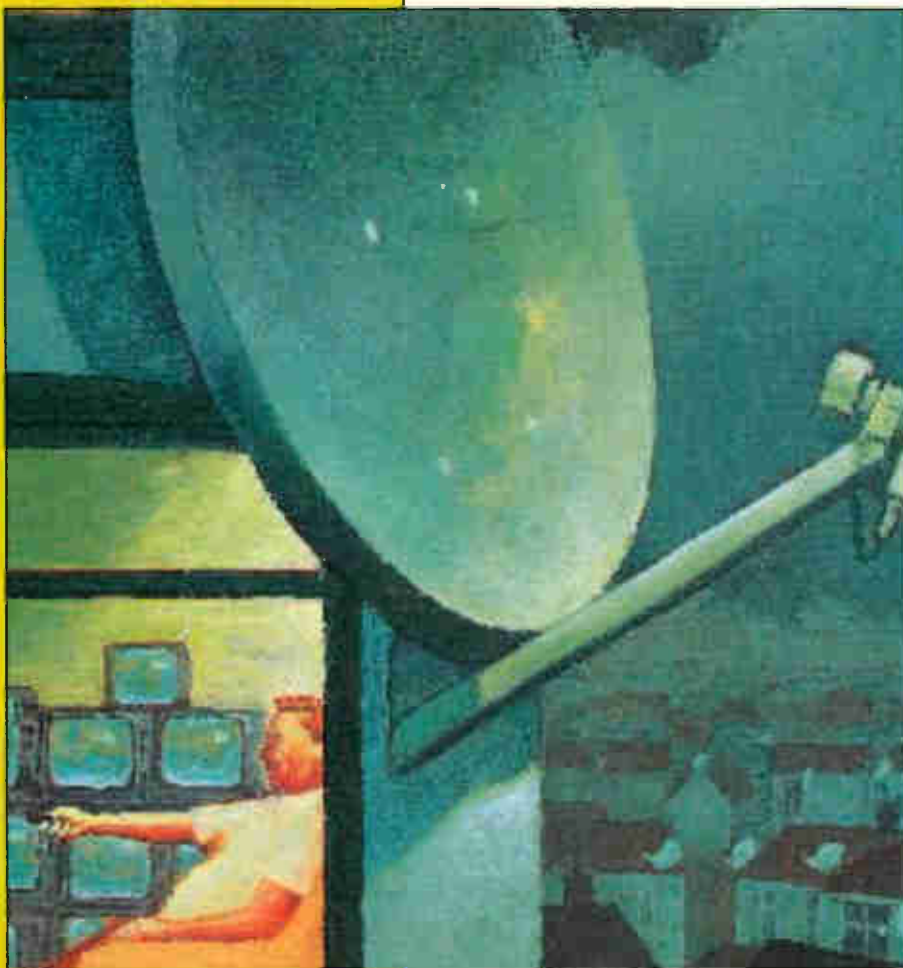
Sony KV1430UB

This ancient Japanese-made set had worked perfectly in its owner's kitchen for nearly eighteen years. It had suddenly developed a fault however: none of the selected channels would hold for more than a few minutes. The owner decided that he'd had more than his money's worth from it, promptly bought a new set (unsurprisingly another Sony) and gave me the old one.

In view of the unhealthy (for the set) environment in which it had been used, my first suspicion was of a combination of dirt and corrosion in the channel push-button selectors. These appeared to be OK however, though I did treat the contacts to a dose of Philips switch-cleaner. Attention was then turned to the stabilised tuning-voltage source, but this too proved to be in order. I was about to condemn the tuner, and hence the set, when by luck I discovered that its tuning-voltage pin was very poorly soldered to the PCB. This was more than likely a manufacturing fault that, incredibly, had taken eighteen years to make itself known. Reliable operation, with an excellent picture, was restored by resoldering all the tuner's contacts.

While the set was in pieces I took the opportunity to investigate why the lights inside the first three channel push-buttons didn't work. As their display is green, I suspected that it was just a case of the bulbs having burnt out. I was surprised to find that in fact neon bulbs are used – bringing back memories of similar arrangements used by the early touch-tune colour sets in the Seventies. The neon bulbs had failed. I was able to replace them with good used ones, but was unable to emulate the green-light effect.

There's no teletext and not even remote control. But the superb design and build quality had clearly helped this Sony set survive despite the far from ideal operating conditions. **D.I.S.**



SATELLITE NOTEBOOK

Reports from
Pete Haylor
Christopher Holland
Hugh Cocks
 and
Michael Dranfield

Hellas at 39°E

I had heard that the Greek channels were to be moved. When I enquired, several people mentioned Hellas at 39°E. Then, after fitting a dish for reception from 13°E, I was asked if I could move it to Hellas. This was done, using a spectrum analyser, and ERT was tuned in. Over the next few weeks several Greek customers asked about the new satellite, so a plan of action was set up. There's a problem with Hellas: the frequencies used by two of the transponders are very close, i.e. 10-955 and 10-960GHz, and as a result several

makes of receiver can't find them. The Topfield range of receivers seems to be OK in this respect. So I bought a number of them and, using one as the master, I programmed the rest, using the RS232 port.

Other problems soon became apparent. Some old analogue LNBS were switched by a Global power switch, and some LNBS were of the early universal type. The switches were removed and a number of LNBS were replaced.

A problem that took a lot of thinking about was when one channel was missing but the rest in the multiplex were OK. The solution was to replace the LNB. The LNBS that caused this fault were the yellow-cap 0-7dB Cambridge Universal type. Any comments?

As those who do work for the Greek community will know, once you do a job for one household you will get calls from members of their extended family. A problem is that they all expect the charge to be the same, even when you explain that the cost of realigning a dish is less than moving it to the other side of the house! So I set up a fixed price list, based on a few initial jobs:



Photo 1: The GPS test caption transmitted at 12.402GHz V via Astra 2B.



Photo 2: On-screen disc menu that comes up when a DVD disc with a direct MPEG recording on it is inserted in a DVD player.

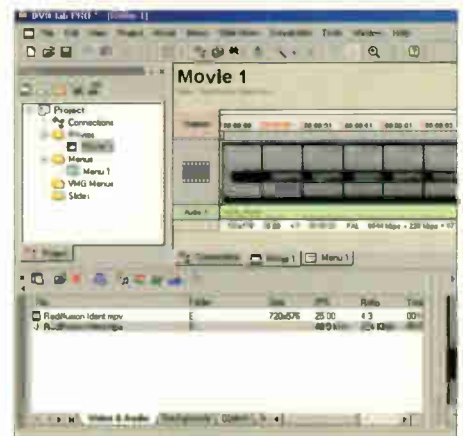


Photo 3: The DVD-lab authoring program.

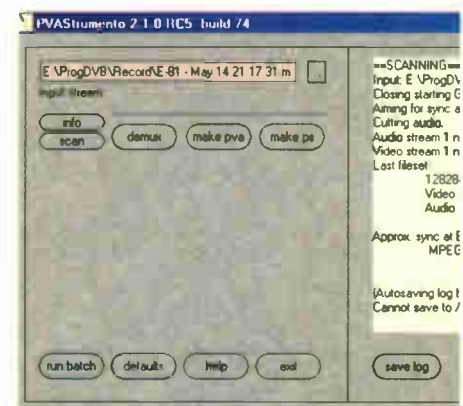


Photo 4: The PVAstrumto program.



Photo 5: ITV Wales via Atlantic Bird 2.



Photo 6: A Meridian TV feed via Atlantic Bird 2.



Photo 7: A Sky Italy feed via Atlantic Bird



Photo 8: Tele Lumiere via Atlantic Bird 2.

Table 1: Latest digital channel changes at 28.2°E

Channel and EPG no.	Sat	TP	Frequency/pol
Broadband World TV (698)	2A	13	11.954GHz/H
GPS test (see Photo 1)	2B	36	12.402GHz/V
Hollywood TV (292)	EB	D12S	11.680GHz/H
ITV Meridian SE (103*)	2A	53	10.891GHz/H
MTV Ireland (440**)	2A	10	11.895GHz/V
Overload TV (208)	2B	36	12.402GHz/V
Sky Vegas Live (292)	2B	31	12.304GHz/H
Spectrum 1 Radio (935)	EB	D7S	11.585GHz/H
Teletext Holidays (697)	2B	37	12.422GHz/H
UKTV Documentaries (564)	2A	6	11.817GHz/V
UKTV Documentaries + 1 (565)	2A	6	11.817GHz/V
UKTV People (566)	2A	15	11.992GHz/H
Wrestling Channel (tests)	EB	D9S	11.623GHz/H

* ITV Meridian SE will appear only with digiboxes that have viewing cards registered in the SE of the UK, but can be added as an 'extra channel' in other parts of the country.

** Available with Irish digiboxes only.

TP = transponder. EB = Eurobird. 2A/B/D = Astra 2A, 2B, 2D.

- (1) Realign dish only and adjust customer's receiver.
- (2) Realign dish and supply FTA receiver.
- (3) Realign dish and supply FTA/CI receiver.
- (4) Install a completely new system.
- (5) Replace LNB plus any of the above jobs.

A phantom fitter in my area (Birmingham) has limited satellite experience and loves to use 'Gaffer tape'. This water-resistant tape is great for its proper job, but not when it's used to hold a cable to an arm, seal an LNB completely, or cover an arm from top to bottom! This is great fun when the tape has been on for several years and has become a soggy mess. The one thing that still works is its ability to hold water in. So the arm beneath it can rot. Picture this scene: a roof-height dish that was covered with tape, an LNB that was completely covered and was rotten, and an LNB holder that had bathroom sealant on all screws. The screws had all rusted but the water was sealed in! All the nuts on the clamps are rotten, and it's raining, snowing – anything but dry!

The dish is usually a Lenson Heath type, which is no longer available. As installers will know, if the bung was not fitted to the arm at the rear of the dish water can run down inside the arm, slowly rotting it from the inside. It then becomes very weak, so be careful when adjusting the dish or changing the LNB. The switch for the two previous satellites is usually attached to the back of the dish, and the coaxial cable is usually old, poor-quality – and may not work at 12.524MHz!

A second phantom fitter is known by lots of people here as "George the Greek". He fits satellite dishes but usually to mortar, and "makes things fit". So, when you come across his work, you have to refit the dish at least.

Is this work worth doing? Hopefully, yes. But trying to explain why a channel has disappeared or become scrambled, or has moved to a new frequency or just stopped, can be great fun when you don't know the answer!

The latest problem has been loss of Cyprus with a number of receivers. The cure is to delete the channel and rescan. The cause seems to be that the PIDs have been changed.

Personally, I call it HELLas! P.H.

Digital channel update

The latest channel additions at 28.2°E are listed in Table 1. Where allocated, the EPG number is shown in brackets after the channel name.

Granada TV has moved from transponder 53 to transponder 54 (10.906GHz/V). TV Record International (EPG no. 830) has moved from transponder C5 (Eurobird) to transponder 36 (Astra 2B) at 12.402GHz/V. C.H.

Recording MPEG-2 signals on a DVD, Part 2

Last month I described the installation of a DVD drive in a PC. A correction is required first: the current LG Multi DVD drive is Model GSA4081 (not 8081). It replaced the LG GSA4040. This time I'll describe how to record a stored MPEG file on a DVD disc.

My article in the September 2003 issue of *Television* dealt with the installation of

Table 2: Ku-band signals available from Atlantic Bird 2 (8°W)

Frequency/pol	SR	FEC	Services
12.573GHz/H	5,632	3/4	ITV Wales. See Photo 5
12.583GHz/H	5,632	3/4	Miscellaneous feeds
12.593GHz/H	5,632	3/4	Meridian TV feeds*. See Photo 6
12.602GHz/H	5,632	3/4	Anglia TV feeds
12.606GHz/V	na	na	Canal Plus (analogue)
12.613GHz/H	6,111	3/4	Italian feeds. See text
12.621GHz/H	3,055	3/4	Sky Italy feeds*. See Photo 7
12.623GHz/H	6,111	3/4	France 2 feeds
12.698GHz/H	2,170	3/4	Tele Lumiere. See Photo 8
12.703GHz/H	6,111	3/4	Miscellaneous feeds
12.703GHz/V	6,111	3/4	Miscellaneous feeds
12.713GHz/H	6,111	3/4	Miscellaneous feeds
12.721GHz/H	4,215	7/8	France 3 feeds. See Photo 9
12.727GHz/H	4,215	7/8	France 3 feeds
12.733GHz/H	4,215	7/8	France 3 feeds
12.746GHz/H	2,894	3/4	Syrian TV. See Photo 10. Also two radio stations

*MPEG 4:2:2 is used, so a PC-based satellite receiver is required.

a SkyStar 2 satellite receiver module and software in a PC to provide reception with either the PC's monitor or a TV set used for the display. Several different software programs were mentioned, particularly Prog DVB and DVB Viewer which, as well as providing reception, enable the channel being received to be recorded on the PC's hard disk, giving subsequent playback at any time – as with a Sky Plus or TiVo box. Use of DVD writing software makes it possible to make a DVD copy of the hard disk recording, one that's playable by most DVD units.

The simplest way to do this, which certainly works with some DVD players, particularly if they can handle audio CDs and MP3 files, is simply to record the MPEG files from the hard disk on to a DVD using Nero or other recording software. Photo 2 shows the on-screen disc menu my DVD player produces when a DVD with a direct MPEG recording on it is inserted. Once this menu appears, press the play button and you get the recording. As you can see it isn't a conventional disc menu, and you can't make chapter points within the recording.

The DVD-RAM disc configuration described last month enables a PC to record the channel being received directly on the RAM disc instead of the hard disk. I found however that when this is done some pixellation and dropouts are evident on rapid scene changes, so it's best to save everything on the PC's hard disk first.

New DVD-recorder drives generally come with an authoring program. This enables simple menus to be created, with captions and pictures, and a 'wizard' will guide you through the process of import-

ing the recorded MPEG file through to recording on the DVD.

The DVD-lab authoring program

A very versatile program called DVD-lab can be downloaded from www.dvdlab.net. It enables complex menu structures to be created, but may appear a little daunting at first sight. DVD-lab is available on a thirty-day trial basis. After that it has to be paid for, the cost being \$99. By this time you will have discovered whether you consider the purchase worthwhile. The current version is 1.3, though 1.4 is now available as a beta version download. See Photo 3.

A problem that can occur when creating a DVD recording from an MPEG file is that the vision and sound drift a little out of sync. A very handy program called PVAStrumento, which is available as a free download from www.offeryn.de, works well to correct this. It demultiplexes the MPEG vision and sound data streams into separate MPV and MPA files and corrects as far as possible anything in the stream that is out of sync, advancing or retarding the audio stream to match the vision. An MPA file is similar to an MP2 file, slightly different from the well-known MP3 sound format. See Photo 4. DVD-lab accepts these separate MPV and MPA files into its 'assets' bin. Once placed into a DVD-lab movie they are multiplexed together again by DVD-lab to make the recording.

DVD-lab can also demultiplex the MPEG recording directly. The PVAStrumento program however is unlikely to be defeated by timing anomalies/glitches with an off-air recording – this can occur when DVD-lab is trying to

do the demultiplexing. DVD-lab has a separate tools menu that enables various tweaks to be done to the recording, including easily trimming the end off if it's a little too long.

Once you have become familiar with DVD-lab, construction of disc menus is quite straightforward. Captions in the menu can be linked to an item on the disc, and backgrounds and buttons can be added. The menus can have a sound

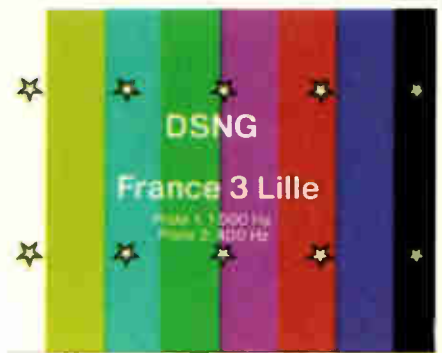


Photo 9: A France 3 feed via Atlantic Bird 2.



Photo 10: Syrian TV via Atlantic Bird 2.

track and some normal vision if required. A secondary audio track, which is available with commercial discs, is not at present possible. It's best not to mix 4:3 and 16:9 recordings on the same disc: the aspect ratio is locked to the size of the first movie recorded on the disc and, though mixed recordings would be playable, you could end up with strange-sized pictures.

It's handy to have a video editing program such as Pinnacle or Adobe Premier installed in the PC, but if a lot of editing is done the sound and vision can end up somewhat out of sync. PVAstrumento can't help much if the editing program has re-encoded the edited video into a new MPEG stream, as this process will have included new time codes in the stream.

Test recordings are best done initially with a rewritable disc, as described last month, to see the results. If necessary DVD-lab can advance or retard the entire audio stream via the tools menu. But you can't hear a preview prior to recording, so some experimentation may be needed!

Off-air TV recording

I carry out off-air recording in a round-about way, feeding the video and audio

into a video camera with a Firewire (IEEE 1394) output facility that sends the signals directly to the PC, where they are captured as an MPEG file by the Pinnacle video editing program. The capture rate can be varied within the program. If the video has a lot of movement it's best stored at about 2GB an hour, which allows just over two hours of material to be recorded on a DVD disc. However I find that acceptable results are achieved at about 1GB an hour if there's not a lot of rapid movement.

Once it has been stored in the computer the file can be imported into DVD-lab, after processing by the PVAstrumento program.

Relevant websites

For satellite receiving software:

www.progdvd.com
www.dvdviewer.com

For DVD related software:

www.dvdlab.net
www.offeryn.de
www.dvdshrink.org

For video editing software:

www.pinnaclesys.com
www.adobe.com
H.C.

Atlantic Bird 2

This month we'll look at the Ku-band output from Atlantic Bird 2 at 8°W. This satellite provides a mixture of TV services, including an analogue channel (Canal Plus at 12.606GHz V), which is increasingly rare these days. Table 2 lists these services. Bear in mind that the symbol rates of feeds can vary and won't necessarily always be as listed. The frequencies used by ITV companies are not used by them exclusively. Italian feeds can appear between 12.613 and 12.623GHz, with 3/4 FEC and a symbol rate of 6,111, 3,055 or, very occasionally, 1,527.

The satellite has a separate footprint that stretches to the US East Coast, with signals transmitted at around 11.000GHz. This doesn't provide signals in Europe. H.C.

Grundig GDS200

This digibox sometimes worked all right. On other occasions it would be dead with no red or green LEDs on the front panel lit. The cause was traced to pin 52 of the ST20 microcontroller chip. It's a part of the memory data bus to the flash memory ICs, and had not been soldered from new. A drop of flux and a touch with the iron cured the fault for good. M.D.

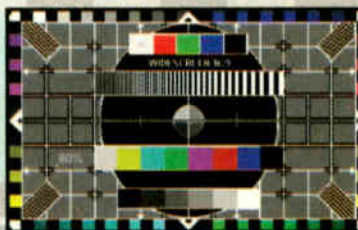
D-GEN A breakthrough in low cost pattern generators now has 15 display outputs and W.S.S, wide screen signaling. New release V1.6 software has improved timing and test patterns.

A Ubicom micro and a 4 Meg flash memory are the base for this new design, 8 bits of data per pixel enabling 32 levels of Colour. Composite, S Video, and RGB SCART output sockets. A DC/DC converter power supply enables just 2 AA cells to power the unit. There is also a DC adapter socket for mains operation that also acts as a charger. Audio 1khz tone sine wave output is available via front Phono socket or SCART connector. The test patterns are interlaced and include crosshatch, dot, centering, colourbars, greyscale, pulse & bar red, green, blue, black, white and flash with red border. The kit comes with a high quality double sided PCB, ready programmed micro and flash memory. All components including case, self adhesive overlay, drill template and full construction manual are supplied in the kit to build the unit pictured. Only soldering of components to PCB and drilling, filling of plastic end panels is required to construct D-GEN.

The unit can be built in three to five hours.

Note: ROM & Micro are socketed and fully software upgradable.

Please state preference of Black or Bone case when ordering, although we reserve the right to substitute a different colour if supplies are unavailable



Full parts kit to build the D-GEN, £75.



See February Edition of this Magazine for full review of the D-Gen Video generator by Martin Trudell. Plus joint winner of the Golden Probe award (see April edition). Hardware V1.5 and NEW V1.6 software further enhances the original design.

(V1.6 UPGRADE) Why not have your original software upgraded to the latest release. Return both the ROM and Microprocessor to us for re-programming for just £5 including return postage. Please email us if you require further information.

SVGA II MONITOR TESTER £29.50 MULTIGEN KIT £58.00 Please add £2 postage per kit to all orders, £3 for overseas orders.

Send cheque, Postal Orders or International Money Orders made payable to C.R.H Electronics Design to:
J Harding, 43 Jonathan Road, Trentham, Stoke-on-Trent, Staffs, ST4-8LP England.

For more information on all these kits, send S.A.E or.

Visit our website "<http://www.videocorner.co.uk>" or Email us at "roy@videocorner.co.uk"

WEB SERVICE

To reserve your web site space telephone
Tel: 01322 611289 Fax: 01322 616339
E-MAILS L.Baldock@highburybiz.com



Alban Electronics

<http://www.albanelectronics.co.uk>

Alban stocks, supplies and provides technical support for a range of terrestrial/cable/satellite and analogue/digital TV equipment. PROMAX (manufacturers electronic test equipment including signal level meters, spectrum analysers, BER/CSI/MER analysers for QPSK, QAM & COFDM, optical fibre light sources and power meters, 16:9 test pattern generators), ALCAD (manufacturers of R.F. wide band and adjacent channel amplifiers, aerials for MATV, SMATV & IRS systems) and ANTARES (cascadeable multi-switches). ALBAN has a complete after sales repair and calibration service that is fully supported by the manufacturers, in addition provides a free system design service using only reliable high quality components.

Irwin Electronics

<http://www.irwinelectronics.co.uk>

As Classic Distributors we complement our existing mail and trade counter business with our website. You can order parts on-line quickly and easily. We intend to explore alternative ways of assisting engineers to run their business successfully.



Alltrade Aerial & Satellite Ltd

www.alltrade.co.uk

Leading distributor to the trade Full e-commerce site with over 1500 products with in-stock quantities! We supply everything associated with Digital/Analogue Terrestrial & DTH/Motorised Satellite reception.

- All Antennas • All Brackets •
- All Cables • All Connectors •
- All Amplifiers •

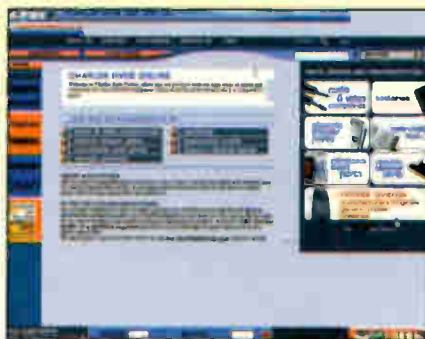
We provide a free MATV/SMATV planning service as well.
Phone 0845 075 0751
Fax 0870 770 9151



Repairhelper's - Storefinder UK

www.storefinder.repairhelper.co.uk

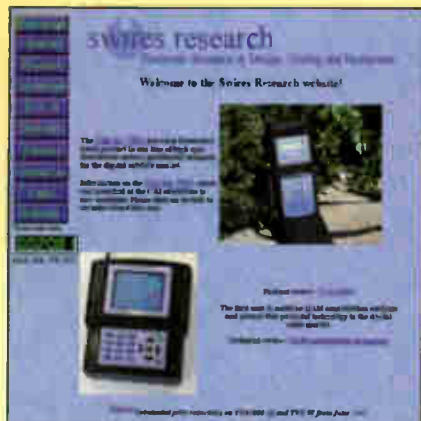
We specialise in promoting electronic repair services throughout the Internet. It's a well known fact that the Internet is the fastest growing advertising medium today but the majority of repair companies and repair engineers are not making use of the Internet to gain more custom. Repairhelper's Storefinder is a UK Search Engine dedicated to the electronic repair trade (i.e. TV, VCR, DVD repair etc). Sign up with Repairhelper's Storefinder - you get your own optimized pre-built web page with a built-in online contact form and complete listings within the Repairhelper Network of sites.



Charles Hyde & Son Ltd

<http://www.charleshyde.co.uk>

Search for both original and copy spare parts in our extensive database covering Akai, Alba, Bush, Ferguson, Goldstar, Hitachi, LG, Matsui, Nokia, Saisho, Sanyo, Sony, Sharp, Thomson, Panasonic, Philips, Samsung, Tascam, Teac, Toshiba, Yamaha and many more. In addition huge ranges of Lasers, Laptops, Remote controls and Semiconductors may be accessed.



Swires Research

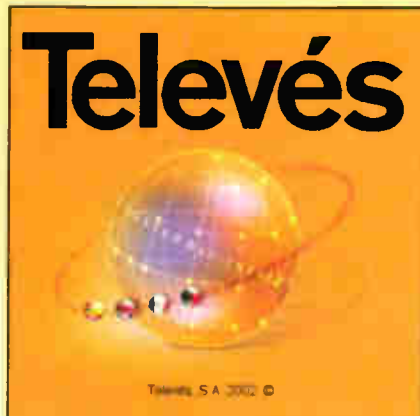
<http://www.swires.com>

Swires Research produce high quality instruments for the television industry, including portable signal level meters and spectrum analysers for digital and analogue RF signal measurements.

J W Hardy Communications

<http://www.jwhardy.co.uk>

R.F. Network Specialist.
Shop online - for R.F.network components. We supply a full range of TV, radio reception equipment to receive analogue/digital signals from both terrestrial and satellite sources. We provide a free planning service for your R.F. networks, MATV and SMATV etc



Televés

<http://www.televés.com>

Televés website was launched as an easier way to keep in contact with our World-wide Network of Subsidiaries and Clients. This site is constantly updated with useful information/news plus you can download info on our range: TV Aerials & accessories, Domestic and Distribution amplifiers, Systems Equipment for DTT and Analogue TV, Meters and much more.



Wiltsgrove

<http://www.wiltsgrove.co.uk>

WILTSGROVE LTD founded in 1984, is renowned as a leading supplier of Audio, Video, TV, Spare parts and Accessories.

We are now pleased to announce the launch of our ONLINE CATALOGUE:

<http://www.wiltsgrove.co.uk>

Our easy to use search engine will allow you to find the products you require via:

- Make / Model.
- Product Category.
- Key Word search.
- Manufacturers part number.
- Our Order Code.

All orders before 5pm will be dispatched the same day.

Tel: (0121) 772 2733

Fax: (0121) 766 6100

Email: sales@wiltsgrove.co.uk

Make sure of your copy of *Television*

It can be difficult finding a copy of *Television* at local newsagents. The number of magazines being published keeps increasing, which means that newsagents have less shelf space for the display of individual titles. Specialist magazines in particular get crowded out.

There's a solution to the problem. Most newsagents provide "shop-save" and/or home-delivery services. There's no charge for a shop save. You simply ask your newsagent to order a copy for you: it will be kept on one side each month ready for you to collect. Home-delivered copies are ordered in the same way, but generally incur a delivery charge.

A newsagent can order any magazine for you, whether or not the shop normally stocks it.

If you buy your copies of *Television* from a newsagent and want to make sure you get every issue, just ask at the counter.



Service Casebook

Michael Maurice

I try to repair as many sets as possible in the field. There are several reasons for this, the main ones being as follows. First TV sets are heavy: if I can repair one on site it means little or no lifting. Secondly there's no need to return to the customer, thus saving time and fuel. And finally the customer can see what I am doing. With most jobs repair in the field is easily completed. Here's a selection of repairs that were carried out successfully in the customer's house – and one or two that required workshop attention.

Philips 28PW6515/05 (A10E chassis)

This set intermittently went to EXT1. The usual cause is the microcontroller chip, or the "painter chip" as Philips calls it. I dreaded the thought of having to replace it, but had heard that the cause of such faults can be dry-joints at the pins. So, armed with solder, flux and braid, I reflowed all the connections to the chip – in the customer's home. I then left it for a week to ten days, saying that if I hadn't cured the fault I would replace the chip.

After ten days I was told that all was well. I wonder how many painter chips have been replaced when all that was wrong was dry-joints?

Toshiba 2987DB

The customer said this set wouldn't come on, while the two LEDs would start to flash. When I switched the set on I noticed that there was arcing in the tube. A new tube was ordered and, with the customer's help (with the lifting), was successfully fitted. But a few hours later the customer rang to tell me that the picture was jumping and the sound went off. When I carried out an inspection I found that there was arcing at the A1 pin of the CRT socket. A call to Toshiba technical confirmed my suspicion that the new tube was faulty. So I obtained and fitted another one. This time all was well.

Sony KV29F2U (BE3D chassis)

This set would revert to standby with the LED flashing. The cause was the field output chip IC500. The set worked when a replacement had been fitted, but there was no sound and the customer only had a universal remote-control unit. All was revealed when I returned with a Sony remote-control unit: the channels were set to system L. Resetting to system I restored normal operation.

Panasonic TX33A1G (Alpha 2W chassis)

There was no picture or sound, though a faint raster could be seen. With the customer's help I got this monster on to

the floor and managed to remove the chassis enough to get to L853, which was open-circuit. It's in the 16V line that goes to regulators on signals panel B. A replacement got things going again.

LG WF32A14T

This monster set produced a very dim and totally defocused picture – the sound was OK. The cause was damp in the CRT socket. There was green corrosion all over the place, and both focus leads were disconnected from the non-existent pins. A new CRT socket restored a normal picture.

Thomson 14CB26UN

The fault symptoms with this TV/VCR combi unit were that it immediately reverted to standby when switched on and the cassette-in light was permanently lit despite the fact that there wasn't a tape inside. I decided that the most likely cause of the trouble was a dirty mode switch in the VCR section, so I stripped the unit down and then dismantled and cleaned the switch. All was well once the unit had been reassembled.

Sony KVE2925U (AE1C chassis)

This 29in. set has a built-in analogue satellite receiver, so there was no way I was going to take it back to the workshop. The fault was sound but no picture: if the setting of the A1/G2 control was advanced a bright raster with a negative picture of very low contrast could be obtained. I decided to swap the chroma module, which was the later type with a comb filter. It houses the TDA4580 RGB matrixing chip, with which I've had problems before. A replacement proved the point – but I now had a picture with no colour! Replacing then adjusting CT301 in the colour decoder reference oscillator circuit cured that. Relief all round.

The customer told me that a Sony dealer had looked at the set, seen the absence of the picture, declared that the CRT had failed then walked out! It shows that a bit of perseverance pays. I was also presented with a stereo system and a VCR to fix, and eventually left the house at 11.45 that night.

Grundig CUC2800 chassis

"The vertical hold needs adjusting" the voice on the other end of the phone said. "No sir" I replied. "there is no vertical hold control in modern sets. Your set almost certainly has a fault!" And so it had. The cause of the poor vertical sync turned out to be C2881, which was virtually open-circuit. It's on the text module. A replacement restored normal pictures.

Decca D28NEE5

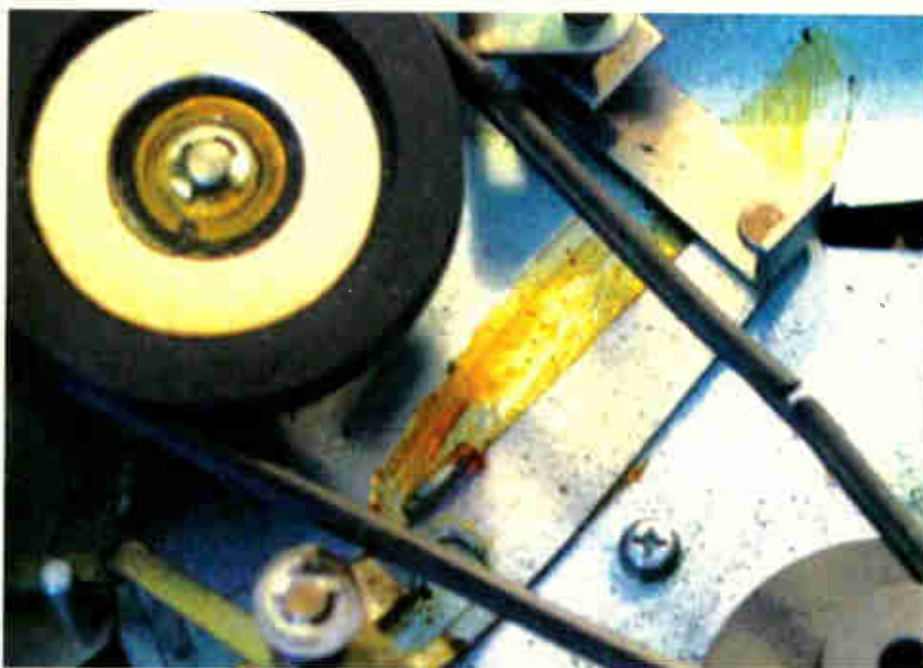
This set was dead because the line output transistor had failed. Whenever I come across a short-circuit line output transistor I try to find the cause. In this case there were almost invisible dry-joints at the line output stage tuning capacitor and at the scan coil connector on the CRT.

Sanyo CPB2168 (EC1-B chassis)

The standby light came on but the set was otherwise dead. It had come from another dealer, who mentioned that the 3-9Ω, 5W surge-limiter resistor R302 was open-circuit. He hadn't deduced from this that the chopper transistor Q313 (2SD1710YB) and its driver Q312 (2SC3807RYA) were both short-circuit. When I replaced them and the optocoupler D315 (CNY75B) the set worked perfectly.

Sony TC355

As I've mentioned before, I love repairing vintage equipment. The owners are usually only too pleased to see their equipment working again, and are willing to pay for the trouble you take. The customer complained about a clicking noise from this machine, which is approximately 35



The rewind drive in the Sony tape recorder Model TC355.

years old. On investigation I found that the rewind drive had started to break up (see photo). A replacement from Sony,

part no. 3-642-546-00, cured the problem, much to the owner's delight. I also gave the heads a thorough clean.

This Magazine reaches over

10,000
potential customers

To advertise in this space
call Luke on

01322 611289

WEB SITE WWW.JOHNSRADIO-UK.COM WWW.JOHNSRADIO.COM

JOHNSRADIO ELECTRONICS TEST AND COMMUNICATION EQPT
**MASSIVE 10,000 SQ FT
WAREHOUSE CLEARANCE SALE**

DC-MICROWAVE TO 300 GHZ - OPTICAL - LIGHT - EQPT - PARTS
TEKTRONIX - HP - AGILENT - MARCONI
PHILIPS - RACAL - B&K - R&S - W&G - ETC

Sales Warehouse, Johnsradio, Smithies Mill, Birstal Smithies Lights, 883-885 Bradford Rd, Batley, West Yorkshire, WF17 8NN.

Tel: 01924 442905 Fax: 01924 448170 E-mail: johnsradio@btconnect.com

Directions M62 Junction 27, A62 to Huddersfield, 1 mile to Birstal Smithies Light., (6 roads) left under factory chimney aerial, Smithies Moor Lane 50 YDS second left red gate.

HOURS M-F 9AM - 1PM AND 2PM - 5PM, SAT 9AM - 1PM

Phone for appointment or to request item lists, photos, site map.

All welcome, Private or trade, for sales, workshop repairs or calibration.

PLEASE CONTACT PATRICIA AT WHITEHALL WORKS, 84 WHITEHALL ROAD, EAST BIRKENSHAW, BRADFORD, WEST YORKSHIRE, BD11 2ER

Tel: 01274 684007 Fax: 01274 651160

WEB SITE WWW.JOHNSRADIO-UK.COM WWW.JOHNSRADIO.COM

www.sdstrade.co.uk

sky Freeview OR sky FREEVIEW

**SPECIALISTS IN ALL MAKES AND
MODELS OF SATELLITE EQUIPMENT**

ALL ORDERS WELCOME - LARGE OR SMALL

REPAIRS FROM ONLY £35 + VAT

SKY & SKY+ SPARES - MOST MAKES AND MODELS

sky+ NEW MODEL SKY+
INCLUDING DELIVERY AND
INSTALLATION KIT - £199

HUNDREDS OF REFURBS AND NEW BOXES
CALL FOR PRICES OR VISIT OUR WEB SITE

**EXCLUSIVE
TO SDS!**



SILVER PACE 2200 DIGIBOXES
CALL FOR TRADE PRICES

SDS
Satellite &
Digital Services Ltd

1 HOWARD AVENUE
BARNSTAPLE
DEVON
EX32 8QA
TEL: 01271 325888
FAX: 01271 329163



Almost everything you need for your business under one mouse

CPC have over 100,000 top quality products online, ranging from spares and components to computing, audio, video, cables, connectors, electrical, security components, tools, in the work place and test equipment all available in just two clicks.

www.cpc.co.uk



FRUSTRATED!

Looking for ICs TRANSISTORS?

A phone call to us could get a result. We offer an extensive range and with a World-wide database at our fingertips, we are able to source even more. We specialise in devices with the following prefix (to name but a few).



2N 2SA 2SB 2SC 2SD 2P 2SJ 2SK 3N 3SK 4N 6N 17 40 AD
 ADC AN AM AY BA BC BD BDT BDV BDW BDX BF
 BFR BFS BFT BFW BFX BGY BLY BLX BS BR BRX BRY BS
 BSS BSV BSW BSX BT BTA BTB BRW BU BUK BUT BUY
 BUW BUX BUY BUZ CA CD DX CXA DAC DG DM DS
 DTA DTC GL GM HA HCF HD HEF ICL ICM IRF J KA
 KIA L LA LB LC LD LF LM M M5M MA MAB MAX MB
 MC MDA J MJE MJF MM MN MPS MPSA MPSH MPSU
 MRF NJM NE OM OP PA PAL PIC PN RC S SAA SAB
 SAD SAJ SAS SDA SG SI SL SN SO STA STK STR STRD
 STRM STRS SV1 T TA TAA TAG TBA TC TCA TDA TDB
 TEA TIC TIP TIPL TEA TL TLC TMP TMS TPU U UA
 UAA UC UDN ULN UM UPA UPC UPD VN X XR Z ZN
 ZTX + many others

We can also offer equivalents (at customers' risk).
A LARGE RANGE OF ELECTRONIC COMPONENTS ON OUR CD ROM - LIST AVAILABLE ON REQUEST
 Mail, phone, Fax, Credit Card orders & callers welcome.



Cricklewood Electronics Ltd

40-42 Cricklewood Broadway, London NW2 3ET
 Tel: 020 8452 0161 Fax: 020 8208 1441
www.cricklewoodelectronics.co.uk
 E-mail: sales@cricklewoodelectronics.com

Complete and fax the coupon to: +44 (0) 1353 654400

I wish to subscribe for one year to Television:
 Price UK £33.80 Europe £48.00
 Rest of World £63.50 US\$99.00 Euro 100.96
 I wish to subscribe for two years to Television:
 Price UK £53.00 Europe £77.00
 Rest of World £99.00 US\$154.00 Euro 157.41

Please tick preferred method of payment
 I enclose a cheque payable to Highbury Business Communications Ltd
 Please invoice me Purchase No

(NB Purchase order must be included to validate invoice)

Please charge my: Master Card/Visa/Amex/Diners
 Club/Switch/Delta (please circle)

Card No _____
 Expiry Date _____
 (Switch/Delta Only) Valid from / / Issue Number

Signature _____

Date _____

Name _____

Job Title _____

Company _____

Address _____

Postcode/Zip _____

Country _____

Telephone/Fax _____

E-mail _____

Please tick here if you do not wish to be contacted by other businesses either by
 Mail Telephone Fax E-mail

Please return to: Highbury Subscription Services, Link House,
 8 Bartholomew's Walk, Ely, Cambridgeshire CB7 4ZD, UK.
 Email: wss@wyverncrest.co.uk (Quote ref: TV1)



TELEVISION

AND HOME ELECTRONICS REPAIR

Television & Home Electronics Repair magazine is the only magazine for technicians who deal with consumer electronic products, in particular TV, Video, Satellite and Audio equipment.

Keep up to date with the latest information and changes affecting this industry including tips & guides on repairing television and electronic equipment including satellite receivers, PCs, monitors, VCRs, DVD players, audio equipment and much more.....



Make sure you receive your regular monthly copy by subscribing today.....

Solution to Test Case 497

- see page 423 -

Mr Fox actually called in the local aerial fitter, and was further miffed to learn that his old receiver couldn't be software-updated to use the newly-introduced, seven-day Electronic Programme Guide! The aerial man was able to solve the reception problem however. It was one with which he was all too familiar since the day transmissions had started from the new public-service (police, ambulances etc.) TETRA (TERrestrial Trunk RAdio) system on the other side of the valley.

These public-service transmissions are in the 380-395MHz band, below the spectrum used for UHF TV broadcasting but close enough to cause breakthrough where the interfering signal is strong and the wanted signal is relatively weak. What happens is that untuned amplifiers are driven into non-linear operation, causing cross- or intermodulation. In this case the VCR's RF-through amplifier was the cause, but masthead and distribution amplifiers can also be affected, and occasionally the TV tuner itself. The on-screen effects vary greatly with analogue signals. With digital reception the almost inevitable result is picture breakup, not necessarily on all channels and programmes.

Aerial Man solved the problem with a bandpass filter, one that admitted the entire UHF band but attenuated the TETRA carriers by 22dB. Mr Fox is going to take Aerial Man's bill to the local police station with a view to them paying it. We wonder how he will fare?

NEXT MONTH IN TELEVISION

Servicing the Hitachi A7 chassis

Glyn Dickinson provides a repair guide for this chassis, which was introduced in 1998 and remained in production for several years. It was used in a wide range of models, both 4:3 and widescreen. The chassis is well-designed, most faults being caused by assembly problems or poor components.

The Sale of Goods Act

The Sale of Goods Act, which originally came into effect in 1979 and was supplemented by Regulations introduced in 2002, affects everyone who has commercial dealings with the public. You can get into difficulties that could involve expense and wasted time if you are not familiar with its requirements. Michael Maurice provides a guide to how it affects our trade.

Test report: Horizon digital SS meters

Anyone installing dishes and aerials nowadays needs a digital signal-strength meter. These come in various forms over quite a wide price range. Eugene Trundle reports on the Horizon terrestrial and satellite signal-strength meters, which work well and are good value.

PLUS ALL THE REGULAR FEATURES

TELEVISION INDEX & DIRECTORY 2004

Plus hard-copy index and reprints service

Here's the essential repair information you need! The Television Index & Directory 2004, in CD-ROM form, contains the text of over 15,000 high quality fault reports on TVs, VCRs, Camcorders, DVD players, Monitors, Satellite TV units, Audio equipment and CD players, searchable by make and model, plus the text of 200 Test Cases and over 250 major servicing articles, from sixteen years of Television magazine. It also contains a full sixteen-year index of Television, a Spares Guide, a directory of Trade and Professional Organisations, an International TV Standards guide, a satellite TV Channel Finder, a TV transmitter list and a compendium of internet resources for service engineers. The software is quick and easy to use, and runs on any PC with Windows 95, 98, ME, NT, XP or 2000.

Television Index & Directory 2004 CD-ROM, £199

Television Index & Directory 2004 CD-ROM upgrade, £46 (to qualify for this upgrade you need to have purchased a previous version of the Television Index on floppy disk or on CD-ROM)

A six-month update of the index and fault reports will be available in May 2004. If you wish to take advantage of this, £10 should be added to your order.

Television Index only, 1988—2003, £36

Television Index only upgrade from previous versions, £18

Hard-copy indexes of Television magazine are available for Volumes 38 (1988) to 53 (2003) at £3.50 per volume.

Reprints of articles from Television back to 1988 are also available, at the flat rate of £4.00 per article — you can order through our web site, or write to the address below.

The above prices include UK postage and VAT where applicable. Add an extra £1 postage for non-UK EC orders, or £5 for non-EC overseas orders, although Channel Island residents do not need to add any extra postage. Cheques should be made payable to SoftCopy Ltd. All major credit and debit cards are accepted. Please use our new secure website for your orders, details below. Allow up to 28 days for delivery (UK).

SoftCopy Limited, 1 Vineries Close, Cheltenham, GL53 0NU, UK

Telephone 01242 241 455 Fax 01242 241 468

**e-mail: sales@softcopy.co.uk
web site: <http://www.televisionmag.co.uk>**

Published on the third Wednesday of each month by Highbury Business, Media House, Azalea Drive, Swanley, Kent, BR8 8HU. Highbury Business is a division of Highbury House Communications PLC. Filmsetting by Impress Repro by Design, Unit 2, Parkway, Southgate Way, Orton Southgate, Peterborough PE2 6YN. Printed in England by Polestar (Colchester) Ltd., Newcomen Way, Severalls Industrial Park, Colchester, Essex CO4 4TG. Distributed by Comag, Tavistock Road, West Drayton, Middlesex UB7 7GE (tel. 01895 444 055). Sole Agents for Australia and New Zealand, Gordon and Gotch (Asia) Ltd.; South Africa, Central News Agency Ltd. Television is sold subject to the following conditions, namely that it shall not, without the written consent of the Publishers first having been given, be lent, resold, hired out or otherwise disposed of by way of Trade at more than the recommended selling price shown on the cover, excluding Eire where the selling price is subject to currency exchange fluctuations and VAT, and that it shall not be lent, resold, hired or otherwise disposed of in a mutilated condition or in any unauthorised cover by way of Trade or affixed to or as part of any publication or advertising, literary or pictorial matter whatsoever.

FROM HAMEG...

SPECIAL OFFER Call our number below and quote "TELEVISION" magazine

Analogue & Analogue/Digital Oscilloscopes from 35MHz to 200MHz, 2GS/s...

Signal Generators & Measurement Systems from DC to 1.2GHz...

Spectrum Analysers & Trackers from 1GHZ to 3.3GHz...

All With Two Year Warranty.

HAMEG UK LIMITED 78 SINGER WAY. KEMPSTON. BEDS. MK42 7PU
Tel: 01234 856345 Fax: 01234 856100 e-mail hameguk@btopenworld.com



NIKKO ELECTRONICS

ELECTRONIC COMPONENTS DISTRIBUTORS

LOPT'S

- LOPT'S FOR MONITORS OVER 500 DIFFERENT TYPES IN STOCK
- LOPT'S FOR TV'S FROM £6.00
- ORIGINAL ELDOR LOPT'S
- HR DIEMEN AND
- LOW COST NIKKO LOPT'S
and more, Pls enq!
- REMOTE CONTROL FOR TV/VIDEO FROM £5.00

DVD/CD LASER PICKUPS + MECHANISM

REPLACEMENT

KSS-210A ...	£7.95	KSS-213D ...	£8.50
KSS-213B ...	£7.95	KSS-213E ...	£8.75
KSS-213C ...	£7.50	KSS-220F ...	£13.00
KSS-240A ...	£17.50	KSS-710A ...	£15.50
KSS-210B ...	£8.50		

ORIGINAL ALSO AVAILABLE FOR KENWOOD, PIONEER, SONY

KHM 220 AAA orig	£57.00
CDM 12.1	£13.00
12.3	£14.75
12.4	£23.00

AND A LOT MORE, PLEASE ENQUIRE!

AN-5277	£2.35	TA-8273	£11.50
AN-7125	£2.49	TA-8276	£11.95
BA-4900	£5.50	TA-8277	£11.95
BA-4901A	£8.50	TA-8427K	£0.89
BA-4905	£5.99	TDA-7384	£4.90
BA-4908	£6.50	TDA-7385	£5.75
BA-4911	£8.50	TDA-7386	£6.99
HA-13158	£5.50	TDA-7490	£13.00
HA-13159	£13.50	TDA-7560	£5.75
TA-8260	£8.50	TDA-8568Q	£5.75
TA-8262	£10.75	TDA-8588BJ	£1.35
TA-8263	£9.25	TDA-16833	£1.48
TA-8268	£15.00	TDA-16846	£1.30
TA-8272		STK-5332	

STK-401-020	STK-407-070	STK-490-310
STK-401-030	STK-407-090	STK-495-020
STK-401-040	STK-407-100	STK-496-030
STK-402-030	STK-407-120	STR-F6523
STK-402-040	STK-407-710	STR-F6524
STK-402-070	STK-411-220	STR-F6535
STK-402-071	STK-411-240	STR-F6552
STK-402-090	STK-411-290	STR-F6653
STK-402-100	STK-412-010	STR-F6654
STK-402-120	STK-412-020	STR-F6655
STK-402-240	STK-419-120	STR-F6656
STK-405-030	STK-419-130	STR-F6668
STK-405-050	STK-419-150	STR-F6676
STK-405-070	STK-442-130	STR-F6707
STK-405-090	STK-443-050	PAL-006A
STK-405-120	STK-489-010	PAL-007A
STK-407-040	STK-490-040	
STK-407-050	STK-490-110	

- Sony tactile switch 4 pin MOQ 10pcs £0.28
- Sony tactile switch 2pin MOQ 10pcs £0.25
- Wire ended lamps for car stereo 6,9,12V MOQ 50pcs £0.15 each

- **SPECIAL MOQ 10PCS**
- S-2000N/CH £0.65
- S-2055N £0.65
- BU-2508AF/CH £0.65
- BU-508AF/CH £0.49
- STR-50103A £1.75
- STR-54041 £1.49
- BUT-11A £0.35
- SAP15P £3.25
- SAP15N £3.25
- UC-3842A £0.45
- TDA-8361/N3 £2.75

• PRICES QUOTED EXCLUDING VAT AND SUBJECT TO CHANGE W/O PRIOR NOTICE.

NIKKO ELECTRONICS
358 Kingston Road, Ewell, Epsom Surrey KT19 0DT
Tel: 020 8393 7774
Email: dalbani@nikko-electronics.co.uk
Website: www.dalbani.co.uk

IT'S EASY TO ORDER

PHONE
020 8393 7774
OR FAX
020 8393 7395

CLICK/ORDER ONLINE
VIEW OUR CAT ON
www.dalbani.co.uk



FREEDOM OF VISION



LIBERTY - FTA 786

- Offering 4000 TV and Radio channels
- Separate TV / Radio List and Favorite group
- DiSEqC 1.2 function and USALS function
- Small size (260x180x55mm)
- Games Included: Tetris, Block out
- 12 languages OSD, (English, Arabic, Russian, French, German, Italian, Spanish, Polish, Turkish, Persian, Dutch and Greek.
- Fast channel switching and downloading



LIBERTY - CI 9800

- 2 slots common interface
- Offering 4000 TV and Radio channels
- Separate TV / Radio List and Favorite group
- DiSEqC 1.2 function and USALS function
- Small size (260x180x55mm)
- Games Included: Tetris, Block out
- 12 languages OSD, (English, Arabic, Russian, French, German, Italian, Spanish, Polish, Turkish, Persian, Dutch and Greek.
- Fast channel switching and downloading Liberty - CI 9800

MAIN DEALER:

Freddie's Satellite Shop

64 Chadwell Heath Lane
Romford, Essex RM6 4NP

Tel. 020 8586 4111

Fax: 020 8597 8295

E-mail - sales@liberty-sat.com

Web site - www.liberty-sat.com

DEALERS:

Kent: JAY'S Satellite and TV Tel: 01474 537746

Lincolnshire: T K Electronics Tel: 01525 344102

Dagenham: RTV Satellite Tel: 020 8592 5152

LIBERTY

Dishes, Cams, LNBs, and other satellite related equipment also available.

Campion Electronics Ltd.

SUPPLIERS OF QUALITY EX-RENTAL TV'S

and video equipment to independent retailers across the UK and EIRE.

FREE DELIVERY SERVICE
to most areas of UK

WORLDWIDE EXPORT SERVICE

Large stock of TVs suitable for export
Experts in UHF/VHF conversion

Visit our large warehouse at:

Units 1 & 2 Tenat Works,
Worcester Rd, Kidderminster,
Worc, DY10 1JR

Tel: **(01562) 746000** (2 Lines)

Just 20 miles from Birmingham City Centre

PERIFELEC

MC 30 A Spectrum Analyser



- Display of full-band and 4 possible expanded spectrums.
- Channels and frequency plans of cable and TV standards memorized.
- Frequency, signal strength in dBµV or bargraph, displayed on a digital display (2 lines of 16 characters).
- Voltage of remote power supply in 14v or 18v and 22 KHz in satellite → DiSEq C™ v1.2 switching.

The panoramic field strength meter MC30A combines in one instrument all the functions necessary for installing and checking TV or satellite reception, both analogue and digital. The visualization of the spectrum and the picture allows the carrying out of all the necessary adjustments with this one instrument. The high technology used in the MC30A allows a range of possibilities unheard of in a instrument in this price category.

Lacuna Digital Satellite Meter

A custom designed, small lightweight ABS case, created with the installer in mind



- Signal strength and BER will be displayed together
- Identifies the chosen satellite
- Signal strengths and BER settings calibrated facility for recalibration by distributor
- Removable 'F' connector
- LNB short circuit protection and LNB power supply
- Compatible with all satellite transmitters in Ku and C band DVB and DSS

NEW Lacuna Terrestrial Digital Meter

Small, lightweight custom designed for terrestrial digital installations

- Identifies transmitter
- Measures signal strength, carrier/noise and BER
 - UHF / VHF
- Analogue and digital measurement
 - Removable 'F' connector
 - 4 line LCD with backlight
 - Weight including batteries 600g
 - 12v line power facility



Full catalogue of meters available, please phone for details.

COASTAL AERIAL SUPPLIES

Unit X2, Rudford Industrial Estate, Ford, Arundel BN18 0BD
Telephone: 0870 2641990 Fax: 0870 264 1991

Perifelec
Sole Import
Distributors

SPARES DIRECT



WWWWhy go any- where else for Panasonic spares?



From phones to cameras, home cinema systems to DVD players, Panasonic brings ideas to life. If you service or repair any of our products, we can make your life easier too, thanks to the new Panasonic Spares Direct website.

Specially developed for smaller companies who only need parts or advice occasionally but still want genuine discounts on guaranteed spare parts, it's now open for business.

Register on the subscription-based site now and for just £24 for a year's access you'll find the most competitive prices, online technical information and repair manuals, special offers and immediate part number identification.

It's fast, it's easy, it's trouble-free and it's the only place you need to visit when you need to service or repair any Panasonic product.

So why call us for spares when you can now visit us 24 hours a day?

Visit www.panasonic-spares-direct.co.uk for more information.

Panasonic

Panasonic GB UK
Willeughby Road, Bracknell, Berkshire, RG12 8FP

www.panasonic-spares-direct.co.uk



sky+ TRADE REPAIR SERVICE FOR THE UK & EIRE

Are you looking for a reliable company to repair your sky digiboxes? We offer **FREE SAMEDAY** Collection when you send more than one box for repair!

- **FIXED PRICES**
Pace, Grundig, Amstrad Fixed price £38 + VAT includes return delivery
Panasonic, Sony Fixed price £55 + VAT includes return delivery
Sky + (Standard repair) Fixed price £45 + VAT includes return delivery
(Hard Drive replacement) Fixed price £75 + VAT includes return delivery
- Prices include all faults Micro processor, Modem, Software corruption and BGA replacement. *Send more than one box at a time we collect for FREE*
- Specialists in the repair of Amstrad & Sony digiboxes.
- Refurbished digiboxes for sale.
- Fast Turnaround Time
- All repairs fully guaranteed.
- Collection arranged from anywhere in the United Kingdom and Eire.
- Authorised Sky Digital Repair Centre.

Receive our latest Satellite and technical newsletter **FREE** through email. Just send us an email with Newsletter in the Subject title to: info@digirepairs.co.uk

Contact:

DIGI REPAIRS (UK & Ireland)
UNIT 25, ENNISKILLEN BUSINESS CENTRE
TEMPO ROAD, ENNISKILLEN BT74 4RL
TEL: 02866327293 (NATIONAL RATE)
0845 6441628 (LOCAL RATE)
Email: info@digirepairs.co.uk

NEW TUBE DISPOSAL

Description	Qty	Price in GBP each
CRT-COLOR; A68QC891X100, DMG, 1.1	5	20
CRT-COLOR; A66EAK071X01	27	30
CRT-TN; 17, 0.26, M41LLH507XX438(XF	4	20
CRT-TM; 17, 0.28D, M41LRK507XX401(X	29	20
CRT-HC; M41KSX683X59(F), 80,17.0.2	10	20
CRT-COLOR; 15" SINGLE, M361.GE27X	124	20
CRT-COLOR; 17" 0.26M41KUN26"D1(T4/	46	20
CRT-SN; 15.0.2.8, M36KUK35X02 (T4/1.P)	89	20
W76LPP350X96	100	20
M90AIII50X32	90	20
W76EGX023X122	10	20
A80FJA33X122	15	20
A59TMZ40X06	10	20
A59ECF50X12	30	20
A51EAI30X01	4	20
A34EAC01X12	5	20
A59EAK71X11/071X11	20	20
A51EFS83X09	15	20
A36EAM40X01	1	20
A59ECY13X01/ A59EHJ43X01	15	20
A79ECU14X01	15	20
A68EEH038X301	8	20
A59ECF20X05	6	20
A66EHJ4301	20	20
A68EEX48X01	28	20
A34JLL90X74W	2	20
A34EFU33X91	1	20

D'Lec Components Ltd

3 Manor Court, Sole Street, Cobham Kent DA13 9BU England
Visit www.dlec.co.uk
Tel: 01474 361276/327677 Fax: 01474 335228
E-mail: sales@dlec.co.uk

ONLINE SHOPPING CHEAPER AND EASIER

www.elclondon.co.uk

TV, VIDEO SPARES AND ELECTRICAL ITEMS



ELC EAST LONDON COMPONENTS
63 PLASHET GROVE, LONDON E6 1AD.
 TWO MINUTES WALK FROM UPTON PARK TUBE STATION
TEL: 020 8472 4871 FAX: 020 8503 5926
 E-mail: sales@elclondon.co.uk

Grandata Ltd

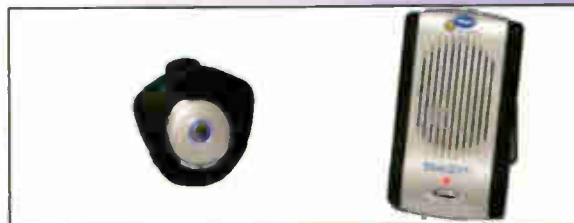
distributor of electronic components

Mobile Phone Wireless Handsfree Solution



Works in any car
Works with any mobile phone
NO cigarette lighter needed
NO Wires
NO Installation

Clip the wireless speakerphone to your sunvisor
 Clip the wireless transmitter to your phone
 Then your ready to drive with both hands on the steering wheel



Order Code : FONEFREE
Price : £ 16.00 + vat

See our 6 page advert for more Special Offers
 K.P. House, Unit 15, Pop In Commercial Centre, Southway,
 Wembley, Middlesex. HA9 0HB England
 Tel: (020) 8990 2320 Fax: (020) 8903 6126
 Email: sales@grandata.co.uk

Economic Devices

PO Box 73, Oakengates TF2 8WR Tel ++44 (0)1952 273130 Fax ++44 (0)1952 405478

Remote Controls ^{from} £5.95 each

Stock held for over 53000 different models

SEMICONDUCTORS
Over 34,000 types of
 transistors, IC's, diodes etc. or equivalents stocked

We take your hassle Some suppliers just won't help. We will work really hard to find those difficult parts - just ask and let our 'no holds barred' enquiry hound work for you.!!!

...and look at the special offers.....

BUT11A @ 29p each BUT11AF @ 41p each
 BU508A @ 75p each Fully wired scart lead 39p

a slight inconvenience....

...you must buy more than one.

BU208A X 5 75p ea	TEA2018A X 5 99p ea
BU508A X 5 79p ea	UC3842 X 5 59p ea
BU508AF X 5 85p ea	CNX62A X 5 29p ea
BU508D X 5 89p ea	S2000AF X 5 84p ea
BUT11A X 5 29p ea	TDA3653B X 5 55p ea
BUT11AF X 5 47p ea	TDA3654 X 5 82p ea
Phillips type 1.2 volt Back up battery	X 5 59p ea
Phillips type 2.4 volt Back up battery	X 5 120p ea
Scart - Scart lead 1.5m Fully wired	X 2 89p ea
Positor PT37 TH98009 (White)	X 5 59p ea
Thom TX100 Chassis 110 DGR LOPTX	each £11.24
Phillips CP90 Chassis LOPTX	each £11.63

...and now ask about our value for money full price list. Remember £1.50 post & handling

All major credit cards accepted

www.telopart.co.uk

The web page here you can look up the price and order all the TV, VCR and Stereo. Web search by model for video parts, remote controls, LDPT's etc. Overseas enquiries particularly welcome.

New CCTV catalogue out NOW
 cameras, monitors, switches, quads, multiplexers, the lot.

TUBES

NEW and GRADED Philips CRTs

28" WIDESCREEN
 from ONLY £130

32" WIDESCREEN
 from ONLY £195

Prices include carriage but are subject to VAT

Quantity reductions

Other makes and sizes of CRT available

De-scratching service

EXPRESS TV SUPPLIES LTD

The Mill, Mill Lane,
 Rugeley, Staffs WS15 2JW
Tel: 01889 577600 Fax: 01889 575600

Service Link

TELEPHONE 01322 611289
FAX 01322 616376

FOR SALE

FOR SALE

SKY DIGIBOXES
£49 EACH
Min 5 boxes
All inclusive
Carriage extra
Phone:
01209 718043

PROJECTOR SPARES

Spare parts and service information for
VIDIKRON
video projectors from
PROJECTSPARES
Tel: 01444 831769
Fax: 01444 831580
E-mail:
projectspares@btinternet.com

SERVICE DATA

SERVICE MANUALS

and Service Sheets for
TV - VIDEO - AUDIO

Prices start at

CTV	s/sheet	5.00
VCR	s/sheet	7.00
CTV	s/man	10.00
VCR	s/man	13.00

No p/p or VAT
- Other items POA -

AMTEL

Huna,
Caithness KW1 4YL
01955 611313
www.amtel.co.uk

WANTED

BEST CASH PRICES PAID

FOR VALVES KT88,
PX4 AND MOST
AUDIO/OTHER
TYPES.

Tel: 01403 784961

Billington Export Ltd
Sussex RH14 9EZ
Fax 01403 783519
Email: sales@bel-tubes.co.uk
Visitors by appointment

SERVICE DATA

OPEN 6 DAYS
TV/VCR CIRCUITS
(WE DO NOT STOCK
AUDIO OR MONITOR
INFORMATION)

TEL A.T.V. on
0114 285 4254

CTV Circuits from £5.00
VCR Circuits from £7.00
CTV Manuals from £10.50
VCR Manuals from £14.50
User instructions also available
(P/P add £2.50 to each order)

**419 LANGSETT ROAD
SHEFFIELD S6 2LL**

MANUAL COLLECTIONS PURCHASED.
(POST 1995)

NEED HELP NOW?

Then ring the
★ **ELECTRON TECHNICAL
HELPLINE** ★

Genuine help available to all
repairers of
T.V. - V.C.R. - SAT - AUDIO
(Inc Valves)

Over 30 years experience and vast
data base
0906 470 1706
Calls cost 60p per minute

ICC17 LOPTX Kit

Widescreen Special
Ferguson W7023U etc.
Thomson 24WK23U etc
Pt no. 10608670P1

ONLY £24.95!

IrwinElectronics
Telephone 0114 273 9622

Ex Rental TVs

**Sony, Philips,
Hitachi**

32 and 28 Widescreens
Portables, Combis

For stock and price
Telephone

Barry McDonald
07836 789528

SERVICE MANUALS

Have you ever turned away
work for want of a Service
Manual? Have you ever brought
a Service Manual and never
used it more than once?

Then why not join ...

THE MANUALS LIBRARY

For details and membership
application form write,
phone or fax:

HARVEY ELECTRONICS

43 Loop Road, Beachley,
Chepstow, Mons, NP16 7HE

Tel/Fax No: 01291 623086

Visa: Mastercard accepted

LINEAGE

CHEAPEST: CABLE TIES, FUSES,
plug-tops, crimps, tapes, tv/video, handsets,
extension leads, fax, printers, baskets, ladies
trousers. Tel: 020 7232 2266. Fax: 020 7232
2288.

For a **FREE**
consultation
on how best to
market your
products/
services to a
professional
audience
contact **LUKE**
on

**01322
611289**

Service Link

WILTSGROVE LTD

35/38 River Street, Digbeth, Birmingham B5 5SB

TEL: 0121 772 2733 - FAX: 0121 766 6100



e-mail: sales@wiltsgrove.co.uk
http://www.wiltsgrove.co.uk

Opening Times: 9:00am - 6:00pm (Monday - Saturday)

OFFER VALID UNTIL THE END OF MAY 2004

UNIVERSAL REMOTE CONTROL

4 in 1



- Guaranteed to work on any infrared remote Television, Video, Satellite Receiver and CD Player
- Has more information preprogrammed in it than any other universal remote. So when you take it home, you know it will work
- Requires 4 x AAA alkaline batteries (not included)

order code **IR-1115** £9.95

UNIVERSAL REMOTE CONTROL

8 in 1

your optimum choice of control



- Preprogrammed with learning capability (permanent memory)
- Teletext and Fasttext functions
- Compatible with most brands
- Illuminated key pad
- Tape easy thumb knob
- Requires 4 x AAA batteries (not included)

order code **IR-2005** £14.95

UNIVERSAL LCD REMOTE

4 in 1



- Replaces 4 separate remote controls to operate your infrared controlled TV, SAT, VCR & cable boxes
- Preprogrammed for many brands
- 2 x AAA alkaline batteries (included)

order code **RC8510** £12.95

FANTASTIC REMOTE CONTROLS ON SALE - WHILE STOCKS LAST

VCR PROGRAMMER



- Program your VCR to record from TV & SAT/CBL using only the handset
- Compatible with virtually every Video Recorder & Satellite or Cable
- Suitable for Digital SAT/CBL including BSkyB, ITV Digital and NTL
- 3 x AAA batteries (included)

order code **URC-5220** £18.95

UNIVERSAL TV ZAPPER



- Ready to operate all brands of TV
- Easy use of basic functions & easy setup without original remote
- The ergonomic design assures optimum use
- **Features** include: Power Toggle, Scan, Channel +/-, Volume +/-, Mute & Colour/Brightness control

order code **URC-6010** £5.85

UNIVERSAL REMOTE CONTROL

3 in 1



- Ready to operate all brands of TV, video recorder & satellite receiver/cable box.
- Easy to use functions
- Easy setup without original Remote
- Guaranteed to work

order code **URC-6530**

1 £4.45

10+ £3.95

FREE TO AIR DIGITAL INSTALLATION KIT



- High quality digital coax cable - for best signal from your digital aerial
- Digital ready aerial amplifier boosts the TV signal in poor reception areas
- Screened flylead minimizes interference for better sound & picture quality

KIT CONTAINS

- **2 WAY AMPLIFIER.** Improves the quality of signal reception to your aerial
- **25m HIGH QUALITY DIGITAL SATELLITE CABLE.** Provides your digital receiver with a high quality signal.
- **1.2m SCREENED FLYLEAD.** Supply your TV with an interference-free signal.
- **2 HIGH QUALITY COAX CONNECTORS.** Gives your receiver a quality connection.

order code **AE-11000** £11.85

8 WAY HIGH GAIN AERIAL AMPLIFIER



- Designed for large industrial or domestic application to boost the signal received by aerial for distribution to TV or radio sets
- Plastic case with keyhole mounting slots, 1 in 8 out. Also with full output

SPECIFICATION:

- Bandwidth: 40 to 890MHz
- Gain: 5dB per channel
- Total Gain: 21dB
- Impedance: 75 Ohm
- Power: 230V AC 50Hz
- Dimensions: 197x80x50 mm

order code **SER-5030** £12.95

6 WAY DISTRIBUTION AMPLIFIER



- Accepts TV and FM radio aerial signals.
- Accepts Video and Satellite receiver outputs
- Fully automatic in operation
- Low power consumption permits continuous operation
- For 6 TVs or Hi-Fi
- Easy to install

order code **SER-9035B** £14.95

REMOTE CONTROL EXTENDER



- RF technology allows the infrared signal to travel through walls, floors & ceilings
- Controls your SAT, DVD Hi-Fi & most appliances with an IR R/C from other rooms in the house
- Extends the infrared signal in more than one room with additional transmitters

order code **AV-7010** **1** £12.95 **10+** £11.90

SONY WIRELESS HEADPHONES



- Operate on built in Ni-Cd rechargeable battery
- 3 Channel options on transmitter for optimum signal reception
- Lightweight open air headphones with auto ON/OFF functions
- 23hr playing time when battery is FULLY charged

order code **HDP-1015RF** £29.95

MAINS LEAD - 3A Fig 8 WITH PLUG



- Mains lead with moulded plug
- 13 AMP plug with 3 AMP fuse
- Length 1.8m

order code **LDM-1015** **10+** £0.89 **50+** £0.79 **100+** £0.74 **1k** £0.59

TV TUNERS



TUNER NUMBER

LG 113-238E 113-238L - SANYO FIBUS0040

MODEL	PRICE	MODEL	PRICE	MODEL	PRICE
LG		SANYO		SANYO	
C120E20	12.75	25XP1	12.75	C21EF95B	12.75
C121E20F	12.75	28DN1	12.75	C21ES55NB	12.75
		28DN2	12.75	C21ES57NB	12.75
		28XP1	12.75	C25EG35NB	12.75
SANYO		C14EA80B	12.75	C25EG65NB	12.75
14MT1	12.75	C14EA85B	12.75	C25EG75NB	12.75
21BN1	12.75	C14EA90B	12.75	C25EG77NB	12.75
21DN1	12.75	C14EA95B	12.75	C25EG95B	12.75
21DN2	12.75	C21EF35NB	12.75	C25EP55NB	12.75
21M1	12.75	C21EF45NB	12.75	C25EP57NB	12.75
21XP1	12.75	C21EF45NBA	12.75	C28EH65NB	12.75
25D1	12.75	C21EF50B	12.75	C28EH85NB	12.75
25DN2	12.75	C21EF57B	12.75	C28ER55NB	12.75
25M*1	12.75	C21EF90B	12.75	C28ER57NB	12.75

*All items are subject to Availability, Carriage & VAT E & OE. Prices & Offers subject to change without prior notice.

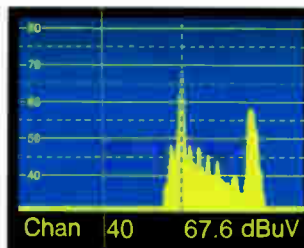
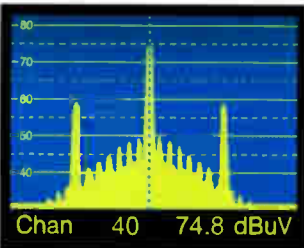
****TRADE ONLY****

Freefax Orderline: **0500 55 05 05**

TELEVISION TEST PATTERN GENERATORS

The new **GV 998** is a digital pattern generator offering more advanced features at again a realistic price. Those features include :

- ◆ MPEG-2 format Transport Stream generation
- ◆ Video and audio included in the TS
- ◆ Video and audio inputs
- ◆ Generation of a variable frequency sound carrier for decoding verification
- ◆ Multistandard and multisystem analogue TV signal generation
- ◆ Possibility to edit different fields of the TS database to present the name of the service provider
- ◆ Remote control via a personal computer
- ◆ Moving video patterns to check MPEG-2 decoders



PROMAX GV SERIES

- ◆ Choice of 12 instruments
- ◆ NICAM and Teletext
- ◆ 4:3 and 16:9 Formats
- ◆ Full field and VITS
- ◆ Computer Controlled
- ◆ Front panel memories
- ◆ Own Company Logo
- ◆ Computer Monitor testers
- ◆ Hand Held Models
- ◆ Multi Standard, PAL, NTSC, SECAM
- ◆ High Quality Construction
- ◆ Attractive Price Levels
- ◆ Full After Sales Service
- ◆ Available from Stock



FOR TELEVISION PATTERN GENERATORS,
THERE'S NO WIDER CHOICE THAN WITH PROMAX



SELECTED ITEMS FROM THE PROMAX RANGE OF TEST EQUIPMENT



MS 250

Analogue and Digital Satellite Detector.



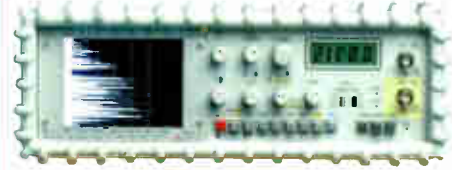
PRODIG 1

Satellite Dish Installer's Meter
Does more than just BSkyB



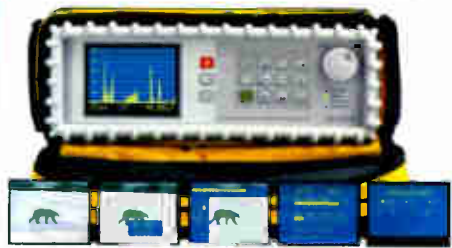
PRODIG 2

Analogue & Digital Aerial Meter
Measures digital channel power and C/N



MC 377+

Analogue & Digital, Satellite & Terrestrial
Measures channel power and C/N



PROLINK 3 + 4 SERIES

Satellite & Terrestrial, Analogue & Digital,
Spectrum Analyser with BER (optional on P3)

Alban

ALBAN ELECTRONICS LIMITED
THE PROMAX SERVICE CENTRE
 6 Caxton Centre, Porters Wood,
 St. Albans, Hertfordshire, AL3 6XT.
 TEL: 01727 832266 FAX: 01727 810546
 WEB : www.albanelectronics.co.uk
 EMAIL : info@albanelectronics.co.uk
 SALES + SERVICE + CALIBRATION



TELECOMMUNICATIONS
TEST EQUIPMENT
AE 767 Spectrum Analyser



NEW!
 THE NEW
 ALBAN WEB SITE ...
www.albanelectronics.co.uk
 FOR ALL THE LATEST NEWS
 AND INFORMATION
 FROM ALBAN
NEW!