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& consumer electronics

Jan 2008

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TELEVISION & consumer electronics

Publisher

Tony Greville - +44(0)1903 774481
info@televisionmagazine.co.uk

Consultant Editor

Rod Tie
info@televisionmagazine.co.uk

Designer

Danny Kosifou
info@televisionmagazine.co.uk

Subscription & Administration Manager

Sue Greville - +44(0)1903 774481
info@televisionmagazine.co.uk

Sales Manager & IT support

James McElhatton - +44(0)1903 774481
info@televisionmagazine.co.uk

Data Manager

Rob McElhatton - +44(0)1903 774481
info@televisionmagazine.co.uk

Please 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.

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All correspondence regarding advertisements should be addressed to the Sales manager, *Television Magazine*, Ashurst, Ham Manor Way, Angmering, West Sussex, BN16 4JQ. Editorial correspondence should be addressed to *Television* Editorial department, Ashurst, Ham Manor Way, Angmering, West Sussex BN16 4JQ.

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It's great to be back. Welcome to the new and greatly improved issue of your magazine *Television* – published by a new and totally-independent company with more news; better technical features as well as contributions from many of your favourite writers that have been absent from its pages in recent years. Welcome back Eugene, Donald and the others – I hope you will continue to ‘pen’ articles for *Television* magazine for a long time to come.



When I bought *Television* magazine from its former publishers Nexus Media a few months ago I did so for one reason and one reason only – *Television* magazine has the most loyal and supportive readers of any magazine I have ever published. At this stage I will make only one commitment – it will be your magazine. I will listen to you the readers; find out exactly what it is you want to read and ensure that it is delivered in an interesting and well designed magazine every month. I want you to know that I, as publisher, am every bit as committed to *Television* magazine as you the readers.

Unlike the previous owner – which had a vast portfolio of over 40 magazines as well as exhibitions and awards evenings – *Television* magazine is my only publication. I will be thinking about how to improve and develop it every waking hour; seven days a week, 52 weeks of the year. I look forward to meeting personally and talking directly to as many readers and advertisers as possible in the months and years ahead.

I am sorry that you have been without your favourite magazine for almost a year. When it was closed it probably made sense from the point of view of a big corporation but it was a disaster for thousands of readers who depended on it to keep them up to date and informed.

Well we are back – better than ever. Many readers have told me that it was only when *Television* magazine was suddenly closed that they realised just how much they valued it. It is a privilege to be in a position to bring *Television* magazine back to you.

I really hope you enjoy this issue – but don't be afraid to let me know exactly what you think. Don't hold back – I really want this to be your magazine. Write to me or e mail me to let me know what you liked and what you didn't; what you would like to see in future issues and any ideas that you have for what we should be covering. I am delighted with the quality of what we have produced in this first independent issue – but there is always room for improvement and there is one thing of which you can be certain – I won't ignore your comments and opinions.

Re-establishing a magazine – even one with the great history of *Television* – is a daunting task. I want, therefore, to conclude by thanking everyone who has helped me along the way. The hundreds of readers who have written to me or called to wish me well – your support and enthusiasm has been an inspiration; the advertisers who have been in contact to pledge their support; and the contributors who have been so helpful with their advice and encouragement.

So *Television* magazine is back – please spread the word amongst your friends and colleagues. Finally: a big thank you to everyone who has taken out a subscription or bought a copy of this issue. No magazine can survive without the support of its readers and, thanks to you, I have absolute confidence that *Television* magazine will not only survive – it will grow and develop into a publication that you will value even more in the future than you have in the past.

Tony Greville

Publisher.

BBC Trust approves HD channel



BBC programmes such as *Cranford* will soon be available in HD

The BBC's proposals for a mixed-genre high-definition television channel, BBC HD, have been approved by the BBC Trust.

Mark Thompson, the BBC's director-general, said, "We are delighted that the BBC Trust has approved the BBC Executive's high-definition television proposals, allowing us to launch the UK's first free-to-air, mixed-genre public service HDTV channel.

"The BBC has pioneered high definition broadcasting in the UK, setting industry standards and defining the HD viewing experience for audiences."

Jana Bennett, director of BBC Vision, said that BBC HD

will be available on cable, satellite and – in due course – on digital terrestrial and the internet.

She said, "It will showcase a rich mix of the BBC's programmes from across its channel portfolio in true, native, high definition.

"Audiences can look forward to the likes of *Earth – Power Of The Planet*, *Cranford*, *Torchwood*, *Hammond's Heroes*, *Diary Of Anne Frank*, *Around The World In 80 Gardens* and *Live At The Apollo* in extraordinary sound and vision.

"BBC HD will embody the range, variety and ambition of our public service broadcasting, which is what audiences value."

ARQIVA HERALDS WHITEHAVEN SUCCESS

Arqiva has confirmed that the second stage of the UK digital switchover in Whitehaven, Cumbria, has been a technical success.

Following removal of the BBC2 analogue signal on 17 October, analogue signals for the remaining channels, BBC1, ITV1 and Channel 4, were switched off on November 14.

All three Public Service Broadcast multiplexes are now being transmitted via high-power digital TV signals from three relay sites at Whitehaven, Eskdale Green and Gosforth.

Blu-Ray versus HD-DVD row

Blu-ray Disc Association's European Promotions Committee has said it, "refutes what it believes are incomplete and misleading comments made by the HD DVD promotional group".

The Association has said it believes the HD DVD camp is, "distorting the facts and presenting information that is intended to portray a misleading message to consumers and the industry".

Behind this furor is HD DVD's recent assertion that the "attach rate" – i.e. the number of software products bought per hardware – was much higher for HD-DVD than it was for Blu-ray – as much as eleven times more.

Quoting back the same independent statistics source Gfk, the Blu-ray group claim that the statement by HD DVD "ignores the fact" that of HD discs bought by consumers year-to-date in Europe, 73 per

cent were in the Blu-ray Disc format and 27 per cent were HD DVD.

Another issue in the dispute is the HD DVD group's definition of what constitutes a Blu-ray player, the group has been unwilling in the past to include the PS3 in hardware sales. It did however include it for the attach rate data as it made its figures look better.

"The stakes are high, so it is understandable that each camp wants to portray their product in the best light," says Frank Simon is, chairman of the BDA European Promotions Committee.

"However, to deliberately mislead the market by misrepresenting the facts is inexcusable. Coming into the critical holiday season many people will be making important purchasing decisions and these need to be based on sound information – not spin and hype."



Freeview has launched adverts aimed at analogue viewers and those considering a second set

Freeview launches ad campaign

Freeview has launched a television advertising campaign as part of a Christmas marketing initiative.

Sophie Alexander, head of consumer marketing at Freeview, said: "Our Christmas advertising campaign was designed to serve two purposes.

"Firstly, to reach homes that don't have digital TV and secondly to reach out to our existing customers who are looking for a second set solution.

"By focusing on the

simplicity of Freeview, its great channel line-up, and demonstrating Freeview's wide appeal, we can instill pride amongst our Freeview consumers while appealing to those who've not yet made their digital choice.

"With digital switchover in progress we hope that by getting our message out there we can maximise the huge opportunity available and ensure Freeview remains the UK's most popular digital TV service."

Freeview capacity looks set to increase



Ed Richards, Chief Executive of Ofcom. ©BSkyB/Justin Downing

More channels – some in high definition – could launch on Freeview under Ofcom proposals to increase the capacity of digital terrestrial television (DTT). The proposed upgrade could see HD TV available on Freeview as early as 2009.

The industry watchdog's announcement follows news that the four terrestrial broadcasters have agreed to deliver HD channels on Freeview.

In a joint statement, the BBC, ITV, Channel 4 and Five said they had signed a 'non-binding memorandum of understanding' pledging to launch HD services between 2009 and 2012.

Ofcom said the DTT upgrade

could be completed by late 2009 – in time for the scheduled digital switchover in the Granada television region. New services would then be available as terrestrial services are switched off across the rest of the UK.

Launch HD on Freeview has been problematic due to the limited capacity currently available for DTT services.

Through a combination of new technology and efficiency improvements however, Ofcom believes the capacity "could, in time, more than double".

Ed Richards, Chief Executive of Ofcom, said, "Digital terrestrial television is a big success story; it is in nearly 13 million homes and it contributes to the choice and diversity of British television.

"Our proposals to upgrade digital terrestrial television represent a major opportunity to build on its success with wider, richer and more varied television services, including the potential for HDTV to be made available to millions of people free to air.

"We look forward to hearing the views of viewers and from right across the industry."



Sky has opened up its commission scheme allowing non-Sky retailers to earn up to £2700 for signing up a single customer

Sky opens up retailer commission scheme

Satellite broadcaster Sky has launched a commission-based scheme that enables non-Sky retailers to benefit from new business subscribers.

Sky claims that the growth of its commercial business provides, "a brilliant opportunity," for retailers to sign up to the Sky Business Retailer Commission Scheme.

Although the scheme has been running over the past year, with more than 90 retailers signed up to it, it has previously only been available to retailers who were already approved Sky agents.

Bruce Cuthbert, director of sales at Sky Business, said, "It is

Sky's intention to roll the scheme out to any qualified retailer who wants to take part in the very near future."

The scheme gives retailers the chance to earn commission in two ways. They can either pass a lead on to Sky which results in an active customer within six months or they can sign up a customer to Sky themselves.

In both cases, the retailer has the opportunity to earn up to £2700 for a single customer.

However, Sky points out that the value of its product has led to some unscrupulous dealers and businesses showing Sky programming without the correct Sky commercial.

EBU warns on interference from new mobile bands

Members of the European Broadcasting Union (EBU) have warned that European Union plans to open up broadcasting bands to mobile telephony could create significant interference problems.

A statement from broadcasters, including Lagardère active, Groupe Canal +, ProSiebenSat.1, RTL and Five on the EBU web site, said: "Interference is not a trivial problem."

"Viewers and listeners who have invested in digital equipment must be guaranteed stable reception and high-quality sound and video."

One of the Commission's proposals – service neutrality – would allow all areas of radio spectrum to be used for any purpose.

If mobile phones were permitted in the broadcasting bands, the broadcasters claim consumers may suffer from widespread and far-reaching

interference, even if "sub-bands" for mobile applications were introduced in the broadcasting bands.

The statement argues that, "market-based management of radio spectrum in the broadcasting bands is a threat to Europe's broadcasting systems" and warn that while, "flexibility and spectrum trading may increase the revenue of some players, it may limit efficient use of the spectrum and the plurality of the offer."



If mobile phones were permitted in the broadcasting bands, the broadcasters claim consumers may suffer from widespread and far-reaching interference

Framework for DTT in Ireland

Digital terrestrial television, or DTT, could well become a reality in Ireland next year, as stakeholders this month entered the next round of consultation.

The Commission for Communications Regulation, often called ComReg, has announced plans to issue RTE with a licence by the middle of next year to operate a digital terrestrial television multiplex.

This regulator will also issue three licences to the Broadcasting Commission of

Ireland, or BCI, which will be charged with holding a competition for other potential DTT operators.

The DTT trial is continuing until the end of August 2008 and the hope from stakeholders is that the test would be succeeded, immediately, by the launch of a full service from 1 September, at least from RTE.

Whether all the testing that needs to be done will have been completed satisfactorily is another question. The test might have to be extended for

another three months.

Broadcast and receiver specifications are very close to being finalised. They may be adopted by the pilot steering group, as the required specifications, by the end of this year.

The BCI said that there is much to be learned from the UK experience of DTT, "in terms of the licensing of the DTT platform, regulatory issues and given the role of UK channels in the Irish broadcasting context".

TV license dodgers are getting easier to spot



The TV Licensing authority now has a new weapon to help curb licence fee evasion - the hi-tech hand-held detector

TV Licensing has unveiled its latest weapon to help curb licence fee evasion - a hi-tech hand-held TV receiver detector.

These hand-held devices are to be deployed across the country. They are to be used alongside the organisation's comprehensive data-base of more than 28 million addresses and existing detector vans.

The devices will be available for all TV Licensing enquiry officers when targeting addresses that have persistently ignored previous contact from the authority.

Roll-out of the new devices is a step forward in detection technology that has been

mirrored by TV Licensing's data-base being continually improved. In 2006, on average more than 1000 licence fee evaders a day were netted, thanks largely to the comprehensive data-base.

In the first six months of this year, more than 214 000 licence fee evaders had been caught.

A spokesman for TV Licensing said, "The new hand-held devices will enhance an already effective enforcement operation.

"Our data-base enables us to focus investigations on unlicensed addresses, which means we can use our hi-tech detector vans and now these hand-held devices in a targeted and focused way to catch people watching TV illegally.

"The message is clear: we have the technology to ensure that anyone watching TV without a valid licence can and should expect a visit, wherever they live."

Those found evading the licence fee risk prosecution and a fine of up to £1000 - plus court costs. In addition, they will still have to buy a licence.



Test reports are available on 85 digital TV products

Consumer web site for test reports

The Research Institute for Consumer Affairs is offering consumers the chance to read its latest test reports on the internet.

A spokesman for the organisation said, "The web site can help consumers find digital TV products that are easy to use, avoid shopping disasters and save you money.

"In fact, our research has found that one of the best indoor TV aerials is also one of the cheapest."

Reports are now available on 85 products, including digital televisions, indoor antennas, set-top boxes and digital TV recorders (PVRs). Forty five more test reports are going to be added before Christmas.

www.ricability-digitaltv.org.uk

HANNSPREE LAUNCHES NEW TVs

Hanspree has announced that it will be introducing a digital range of TVs with affordable price tags into its budget XV range.

Complete with a DVB-T digital tuner, HANNSpree, the XV GT range also includes an analogue tuner for anyone who can't yet get the digital signal, but wants to be prepared.

Those who can receive the digital signal, the tuner provides access to all Freeview channels and the ability to go interactive via the red button. It does not offer the new 'Freeview Playback' standard though.

Each XV GT LCD TV boasts an 8ms response time and a viewing angle of 176°. They are wall mountable, with VESA standard wall-mount plates.

Connectivity comes with two Scarts, two HDMI ports and S-Video.

Hanspree's new 'GT' TVs in the XV range are available as both 32in and 37in models for £399 and £519 respectively.

Channel 4 begins HD tests

Channel 4 has started test transmissions for its high-definition service on digital satellite.

Currently alternating between a black screen and a holding page, the channel may be found at 12.188H at a symbol rate of 27.5 with FEC 2/3.

In September, Channel 4 announced that it plans to launch Channel 4 HD on channel 140 in December. It will offer a high definition simulcast of its main service on satellite.

Big broadcasters on Bebo?

The BBC, Channel 4, Sky and MTV are among broadcasters enabling Bebo users to view free footage, add it to their profiles and share it with other users.

"This will vastly speed up the process of word-of-mouth recommendations between users," a spokesman for Bebo said.

Each broadcaster adds footage to its own Bebo page, retaining copyright.

Bebo has 40 million members worldwide including

10.7 million in the UK. Many of these members are within the 13 to 24-year-old age range attractive to advertisers.

Twenty-two broadcasters have created Bebo pages and made footage available under the site's 'open media' initiative.

Other clips on the site include ITN sport and entertainment bulletins, music videos from MTV and footage from smaller TV producers such as Sumo.TV and Kontraband.

Media companies will not be charged for access to the platform and are able to distribute their content using their own video players. These players can carry their own advertising and allow them to retain 100 per cent of the related advertising revenues.

Bebo hopes the addition of thousands of hours of short and long form content from major global entertainment brands and emerging media companies will increase the

Photo: 'The Mighty Boosh' ©BBC



Twenty-two broadcasters have created Bebo pages and made footage available under the site's "open media" initiative

audience's engagement with the site and thus the value of Bebo's advertising and brand associations.

HITACHI ADDS NEW "DEPTH" TO HD TV

Hitachi claims to have added new 'depths' to digital viewing with the launch of the T-Series, a family of 1080 Plasma and IPS LCD flat screens. These use picture enhancing technology to create, "a more realistic large-screen image, tailor-made for today's high-definition (HD) digital content".

The P50T01 is described by Hitachi as a "spectacular" 50in plasma that "will prove a big hit with Europeans eager to experience the latest HD broadcasts, as well as output from Blu-Ray devices and next generation digi-players."

A newly developed full-HD version of Hitachi's Picture Master image processor is included in T-Series sets.

This 16-bit colour recognition engine uses 3D colour management to create better skin-tones. A twin 'dynamic enhancer' enables superior reproduction of shiny and glossy items. Such items, Hitachi says, are traditionally among the most difficult surface looks to reproduce – even in HD.

Richard Bass, senior manager for display products at the Hitachi Digital Media Group, said: "Our T-Series excels in image quality, offering outstanding texture, tone, gloss and shine for remarkably life-like image reproduction.



Hitachi's new T-Series takes, "...TV into a new dimension - delivering a viewing experience that will leave users wanting more." Sounds satisfying!

"When viewed on these new advanced large screens, the images have to be experienced to be believed.

"Our designers in Milan worked closely with Japanese development teams to create a new 'family' look for the T-Series – a sleeker, more curvaceous frame; ultra-slim, bottom mounted speakers; and slimmer tapered bezels.

"The result is equally at ease in both contemporary and traditional settings and reflects European trends towards simpler, softer, more organic forms and furnishings."

The T-Series is available with either a matt or a glossy black bezel.

Plasma screens come with a powered swivel base as standard, and the LCD with a manual version. Alternatively, the sets can be wall mounted.

The sets feature two HDMI and three Scarts.

Mr Bass added, "With our T-Series we have taken the best colour, image and viewing technology available and combined it with all round connectivity and a first class design to make this one of our most appealing ranges ever.

"It takes TV into a new dimension – delivering a viewing experience that will leave users wanting more."

LG previews new HDTV with Wi-Fi

LG has unveiled preliminary details of a new television that it plans to reveal formally at the Consumer Entertainment Show in Las Vegas in January.

This new HDTV is claimed

to be the world's first to offer a full high-definition while also including Wi-Fi.

The 52LG71 will provide a full HD 1080p picture like most competing 52in sets. But

it will also incorporate an 802.11 link that streams HD over a local wireless network.

This would mean that owners of the new television would not need a separate

media hub or an extender to watch their home content, LG points out.

No real specifications have yet been released, other than that the set will boast a 120Hz panel and other technologies that, "represent the best of LG's technology".

HD technology row

The prospect of 'megabucks' from the analogue TV spectrum sell-off could betray millions of Britons who bought into what they thought were future-proof IDTVs.

That is how some people view the statement by Ofcom boss Ed Richards who indicated that Ofcom's preferred route relied on new technology rather than additional spectrum to bring high-definition pictures to the digital terrestrial TV platform.

This 'new technology' would, of course, require viewers to buy additional equipment to view the new services and could end up adding more confusion as viewers prepare themselves for analogue switch-off.

Industry's attitude to Mr Richards' statement is divided. All agree though that the neater solution would be to grant the spectrum required to bring HD channels to the Freeview platform now – even

if at a future date compression technology might allow some of it to be sold off later.

Ofcom is yet to release details of its proposals. It is widely believed though that it will include clearing one of the three public service multiplexes. It will be converted to DVB-T2 – which offers at least a 30 per cent increase in capacity – and Mpeg-4.

Current Freeview standards are DVB-T and Mpeg 2, which are used in most of the world's digital TV platforms.

The problem with DVB-T2 is that the standard has not yet been finalised.

A draft standard is unlikely before next year. As no one else is yet using it, the UK could find itself the only country in the foreseeable future to take it up. This would leave manufacturers with the headache of providing unique equipment for the UK.



Free tutorials for technophobes

John Lewis's audio-visual department on Oxford Street is running free "Technophobe Tutorials."

These tutorials are intended to help customers master their new gadget gifts and make them more able to impress their

Get to grips with gadgets. John Lewis is offering free courses at its Oxford Street store

friends and family with their new toys' amazing abilities.

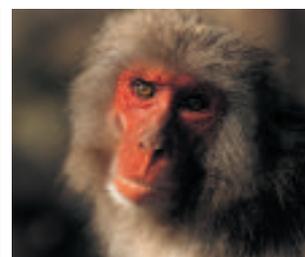
The tutorials will be held with "expert geeks" at the store who will offer help with everything from getting to know your new Nintendo DS, to programming DAB digital radios.

These one-to-one classes are available to book in advance and will be held throughout January and February on the fifth floor.

Fox time shifts

Fox International Channels UK is to launch a new time shifted version of FX in December.

The broadcaster currently offers FX+2 – a two hour 'stagger-casted' version of the main channel. However, from December, FX, delayed by one hour, will also be available to digital satellite viewers.



New content on Virgin Media

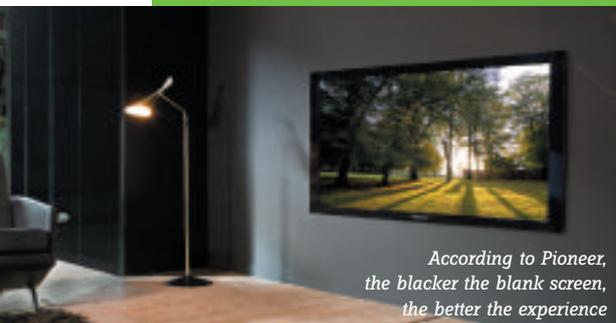
Virgin Media has added content from National Geographic and Discovery to its digital cable video-on-demand service.

According to Virgin, video-on-demand has been a focal point of its television development efforts in recent months. The new content amounts to more than 80 hours of science, nature and lifestyle programming.

Malcolm Wall, Virgin Media's chief executive officer of content, said: "We're thrilled to be expanding our on-demand service with this exciting new content from Discovery and National Geographic Channels.

"We take pride in catering for an incredibly diverse audience, and along with our movies, kids entertainment and drama, we're delighted to be widening the appeal of our on-demand offering with these great new shows."

SLIM PLASMAS THAT SHINE IN DISPLAYING BLACK



According to Pioneer, the blacker the blank screen, the better the experience

A range of ultra-slim 50 and 60in plasma TVs called 'Kuro' – which means 'black' in Japanese – has been launched by Pioneer.

One of the highlights of this range, according to Pioneer, is that it can achieve significantly deeper blacks. This in turn enables richer colours and sharper detail.

Heidi Johnson-Cash, general manager for marketing at Pioneer, said, "Whereas in the art world, white represents a blank canvas, in the

world of television, a black screen is a blank canvas ready for content to be displayed.

"Pioneer engineers have reached a significant achievement by creating black levels that are 80 per cent deeper than previously possible – defining the ultimate 'blank canvas' ready for high-definition movies, TV and sporting events.

"The ability to create the deepest blacks results in the ability to create the richest colours."

The Kuro range also features an 'optimum' mode that automatically processes images, based on the programme source and room conditions.

Dark images will be processed differently from bright ones. For example, a football game during the day will be processed differently than a night game.

Optimum mode also controls brightness levels, so that viewers get the optimal picture, regardless of the lighting conditions.

All screens in the range offer 1080p HD playback.

Putting a stop to analogue

Consumer electronics manufacturers and electrical retailers are seeking industry-wide support for a plan to phase out the sale of analogue TV equipment.

The Digital Television Supply Chain Group* (SCG) has written to retailers to seek their support for a commitment it made to the Government about future sales of analogue TV equipment. Its membership includes, among others, Panasonic, Sony, Comet, Currys and Tesco.

This commitment was that retailers would stop selling analogue TV equipment one year before switchover in any region. Alternatively, they would clearly mark products as "analogue" and bundle them

with a digital TV converter box.

The SCG said it had also committed to "clear and accurate use" of the digital tick logo.

This letter also outlined a forthcoming European legislation that will have a major impact on sales of analogue TV products.

Europe's Unfair Commercial Practices Directive, due to be introduced next Easter, will make it an offence "to omit pertinent information on a product or service that might materially affect the consumer's decision to purchase that product or service".

**This group was formed by the Digital TV Group, manufacturers' association Intellect, retailers organisation Retra and the Confederation of Aerial Industries.*

Murdoch outlines Sky's plans



Rupert Murdoch: "History has shown that it is competition and free markets that deliver real, sustainable value."

Media magnate Rupert Murdoch has outlined Sky's plans to compete in an increasingly deregulated UK broadcasting market.

In an address to shareholders at Sky's recent annual general meeting, Sky chairman, Murdoch, said, "British consumers enjoy better choice, better quality and better value in entertainment and communications than ever before – this is a direct result

of the dynamic and competitive marketplace that Sky has helped to create.

"Sky helped to bring about the end of that world of limitation and scarcity where people watched the programmes that the broadcasters wanted them to watch, at the times the broadcasters decided to schedule them."

In a nod towards Ofcom's increasingly light-touch approach to regulation in Britain's broadcasting marketplace, he said, "History has shown that it is competition and free markets which deliver real, sustainable value.

"This is something that we should encourage and celebrate more, here in the UK. I see no reason to be fearful of allowing choice and innovation to flourish even more freely in the years ahead."



LG UNVEILS NEW PLAYER

LG Electronics has announced the launch of its second generation dual-format high-definition disc player.

Like its predecessor, the 'Super Blu' player is capable of both Blu-ray disc and HD DVD playback. It offers full networked interactivity available on selected HD DVDs and the capability to handle networked 'BD-Live' interactivity on forthcoming Blu-ray discs.

Access to these features enables viewing of storyboards, production videos and director's commentary while the movie is playing.

Using the 'picture-in-picture' option, consumers can watch these while still keeping an eye on the film.

The Super Blu player also

accepts additional content via a network connection and can up-scale the picture quality of standard DVDs.

It can output up to 1080p resolution at 24-, 30- or 60-frames per second (fps) and supports a number of A/V formats including Mpeg 2, VCI, H.264 video, Mpeg1/2 audio, Dolby Digital, Dolby Digital+, DTS and DTS-HD audio.

Furthermore, the unit includes multiple inputs/outputs such as HDMI 1.3 out, component / composite video outputs, digital optical and analogue audio outputs as well as LAN Ethernet port for network interactivity.

It's equipped with a USB media host for easy access to digital music and photo libraries.

Growth at the CAI

THE Confederation of Aerial Industries (CAI) claims that the past year has been a "very exciting one" for the organisation.

The CAI revealed that 231 CAI member companies had become 'CAI plus' members. This, the organisation said, equates to 453 individual engineers, with more joining all the time.

The CAI plus scheme was launched last year to create a higher membership category than already exists. This is intended to allow all of the CAI's 10 000+ engineers to gain recognition as qualified digital installers as part of CIA's

initiative regarding the digital switchover.

A spokeswoman for the CAI said, "The CAI trains on average, over 600 engineers each year across its wide curriculum of courses.

"For systems engineers, an intensive distance-learning course that takes around seven months to complete, and has a student intake of around 25 candidates. This course is certified by City & Guilds."

Meanwhile, the industry's very own NVQ is building in numbers gradually.

Nationwide, around 100 engineers have attained a Level 2 in Signal Reception.

The CAI has its own pilot scheme running in partnership with North Hertfordshire College, with 27 students enrolled.

Christmas Capers

by Keith Hamer and Garry Smith

We over-optimistically planned to have the first issue of *Television* out before Christmas; oops. Here's hoping that you had a great time over the festive season, and that this one helps you slip back into the festive mood for a little while – cheers!

Once again, the festive season is upon us. In bygone issues of the former *Television* magazine, it became something of a tradition that we dusted down our archives and presented a selection of the special BBC-TV Christmas identification symbols shown between every programme.

Thanks to the re-launch of the magazine, we're back with a fresh selection of TV graphics, many of which are extremely rare because the BBC destroyed all its precious Christmas designs once the last packet of mince pies had been gobbled up and the tinsel began to look a bit past its best!

In this offering, we will be looking at the special Christmas Symbols used on BBC-1 and BBC-2 in various years to give a broad flavour of the ingenious designs that the BBC Graphic Design department at Television Centre came up.

We will also be looking at later offerings concocted by external companies. We'll let you decide who came up with the most effective and innovative ideas.

BBC-1 Christmas Globe Symbol, 1974

We begin this festive review with a look at a real golden oldie buried deep within the archives. It's

extremely rare. This is possibly the first time that it has been published in colour.

We go back to Christmas 1974 and a specially made silver globe revolving in front of a curved mirror. The theme of a rotating globe had been the famous hallmark of normal BBC-TV presentation since 1963, prior to the official commencement of BBC-1 and BBC-2 on April 20th, 1964.

A rotating Globe of some description had been used on a daily basis at every programme junction between 1963 and March 2002. The specially designed Christmas Symbols came into being in 1969 to mark the first 'Christmas In Colour' on BBC-1 (colour came to BBC-2 on 1 July, 1967 and BBC-1 on 15 November, 1969).

The first BBC-1 Christmas Symbol was featured in the January 1990 issue of *Television* although, alas, in monochrome! But don't forget, it wasn't easy to capture off-screen captions back in 1969. Home video recorders were not available and colour recording was a non-starter.

Instead, the authors had to rely on standard 35mm film cameras in the hope that the never-to-be-repeated special Christmas Symbols



The BBC-1 Christmas Identification Symbol transmitted in 1974 featuring a specially-made rotating silver Globe

had been successfully snapped for posterity!

But back to 1974 and the BBC-1 Christmas identification symbol. Again, video recorders were out of the reach of most viewers so to have this example in glorious colour is quite a catch. Well, unlike many UK broadcasters in recent months with fraudulent phone-ins and contrived competitions, we must be honest about this rarity and confess as to where it actually came from.

The authors didn't 'snap' it and send the 35mm colour film off to some dodgy processing company only to find that the printed results were over-exposed and lacking in any vitality. No, this rare photograph was unearthed off a spoof Christmas tape produced by the video tape engineers at Television Centre some thirty-four festive seasons ago. The tape, which couldn't be shown publicly even in these days of totally tasteless TV, featured out-takes and faked mistakes and, for some reason, this Christmas Symbol.



Fig. 2

Two revolving chirpy Christmas robins were the theme for BBC-1 in 1985. The final 'live' Christmas Symbol to be used

Ruffled Robins In 1985

Up to and including 1985, all the special BBC-1 and BBC-2 Christmas identification symbols were transmitted 'live' between every programme junction and consisted of a revolving mechanical model placed in front of a camera. Because the symbols were always live, the unexpected could happen – and often did.

Possibly the most troublesome Christmas Symbol was the one used on BBC-1 in 1985. This consisted of two revolving robins which busily chirped and flapped their wings between programmes as they whizzed around perched on a turntable bedecked with snow.

The Symbol was designed by the BBC Graphic Design department at Television Centre under the direction of the late John Aston.

It seemed a fairly straightforward design in comparison with other very complicated concoctions but, alas, its apparent simplicity did not match its ultimate fiendishness! Unfortunately, the robins had a nasty habit of tightly shutting their beaks, tucking their wings in firmly and refusing to whiz around in the snow.

Just as John Aston was about to tuck into his Christmas Dinner at home, the telephone rang. It was BBC Presentation at Television Centre in a huge flap, which was more than the robins were doing with their tiny wings.

The mechanical model had ground to a halt and there wasn't a back-up recording on video tape. John, who was the manager of the Graphic Design department, had to leave his

dinner and rush over to Television Centre in an attempt to cajole, or threaten, the robins back to work before the next 'live' screening.

John wasn't best pleased as he related the sorry saga to the authors of this article several years later. Some high-up BBC executives were also not too impressed so as soon as the Christmas robins bowed out for the last time at close down on Boxing Day evening, plans were afoot to wreak revenge on the wayward feathered miscreants.

The execution of the defenceless robins was held in public on the following Saturday evening when Noel Edmonds blasted the dear little Christmas robins to smithereens with a blunderbuss!

Needless to say, all BBC-1 and BBC-2 Christmas identification symbols after 1985 stopped being live mechanical models. They were, instead, recorded on film loops, video tape and later, video discs.

BBC Traditions End

Moving on to more recent times, all BBC presentation has been privatised and most of the much-loved traditions at the BBC have all but disappeared. No-one seems to have any inkling of, or interest

in, what the BBC once stood for. So now the usual day-to-day BBC identification symbols tend to be bizarre and totally meaningless.

Back in 1989, the new Head of BBC Presentation wanted to discontinue to well-loved, traditional rotating BBC-1 Globe Symbol used in various forms since 1963. She came from a rival commercial channel where she had sanctioned the use of cheap-looking coloured plastic bricks flying around to form the channel logo.

Unfortunately, the new chief had no idea at all about the fine traditions of BBC Presentation. The Globe was about to rotate for the very last time.

Fortunately, John Aston – Manager, BBC Graphic Design – invited the authors to a special lunch at Television Centre in the hope of dissuading the new head from ruining BBC Presentation. Armed with masses of photographs, video recordings and detailed knowledge of the BBC traditions, we did indeed delay the demise of the BBC-1 Globe Symbol.

The new Head of Presentation decided to introduce the popular Globe in the form of a hot-air balloon which gracefully floated over famous British landmarks such as the Forth Railway Bridge, County Down, Cardiff and Canary Wharf.



Fig. 3

This BBC-1 Christmas Symbol was used in 2002 and repeated in 2003, just to prove that Scrooge was still alive and well at the BBC Television Centre!

BBC-1 Repeats 2002 Christmas Symbol

Now that BBC identification symbols are in privatised hands rather than the in-house BBC Graphic Design department, they tend to be much less innovative. The BBC-1 Christmas Symbol used in 2002 was perhaps not the finest example of graphic design work. It featured lots of children dressed up as large snowflakes dashing here, there, and everywhere. But someone, somewhere, possibly in the BBC finance department busy counting the pennies, obviously liked it because, for the first time in the BBC's history, the same Symbol was also used the following Christmas in 2003.

BBC-2 Christmas Identification Symbols

Over on BBC-2, there has always been a good variety of special Christmas identification symbols – ever since our festive BBC archive collection began back in 1969.

In keeping with BBC-1, following the Christmas Robins debacle, all the special festive BBC-2 Symbols have been sourced from film or video recordings. The last mechanical BBC-2 Christmas Symbol in 1985 featured a revolving glass panel depicting various winter scenes encasing a cheery static red '2'.

The 1986 design featured the new-style 'TWO' graphics (rather than the traditional '2' used in various forms since BBC-2 began in 1964) set in crisp, glistening snow. It was a very effective piece of graphic design.

A comical theme came to BBC-2 in 1995. A specially produced series featuring the popular animated 'Wallace & Gromit' characters was being aired over the festive season on BBC-2.

As a result, the graphic designers thought it would be a good idea to 'product-place' them in viewers'

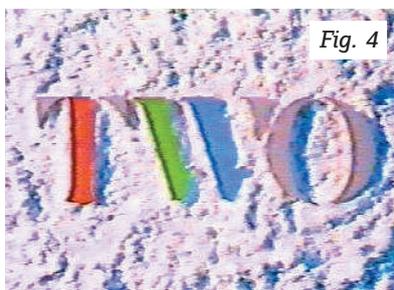


Fig. 4

The Christmas theme for BBC-2 in 1986 was their standard 'TWO' identification in red, green and blue set in crisp, glistening snow

minds between every programme. So, we were treated to Wallace and Gromit switching on their Christmas fairy lights, which flickered and popped into life – but only just!

For our last example of the special festive BBC on-screen identification symbols, we were going to feature the design from 2001, which was repeated in 2002 and, amazingly, again in 2003. This would have been fair enough if the design was noteworthy and impressive. But it wasn't; it was dire.

So we'll swiftly rewind to the very colourful Christmas Symbol unveiled in 1997. This consisted of a snow scene encased in a glass shaker, initially featuring excited faces to be replaced by a large central '2'.

Further Reading

So that's our dip into the Christmas archives for this year. Please write to us if we have stirred fond festive memories or if you would like



Fig. 6

The colourful BBC-2 Christmas Identification Symbol radiated during 1997 featuring a snow scene encased in a glass shaker



Fig. 5

Wallace & Gromit switched on their flickering Christmas fairy lights between every festive BBC-2 programme in 1995

another selection of BBC Christmas identification symbols. Our private BBC Christmas archives began in 1969 and only one special BBC-2 Symbol from the Seventies has managed to elude our cameras and video recorders! Our standard BBC archives began in 1963 although it also goes back to the days of Baird in the 1920's.

Further selections of BBC Christmas identification symbols were previously published in the January 1984 (Christmas Test Card Saga) and the January 1990 (Christmas Caption Capers) issues of *Television*.

There are also examples in books written by the authors of this article such as 'The Story Of BBC Colour Television' and 'This Is BBC-tv: The First 30 Years Of Television Graphics (1934 – 1964)'. These are available at £6.95 each, including postage and packing, from *HS Publications*, 7 Epping Close, Derby DE22 4HR (Tel: 01332 38 16 99). Please send a stamped, addressed envelope or, alternatively, an E-mail to TVGraphics@test-cards.fsnet.co.uk for further details.

If you are interested in TV graphics, test cards, DX-TV or archive TV, take a look at our website at www.test-cards.fsnet.co.uk via the Internet.

Test case 530

TV model:
Sanyo CE32FWH4-B

"It's utterly demoralising to replace faulty parts, only to experience an instant blow-up on restoring power." Find out what was done to make sure that it didn't happen twice with this big-screen TV repair case study

It's not often that Sanyo products come into the Test Case workshop, and it must be admitted that nobody here is very familiar with them.

Even so, this particular example, TV model CE32FWH4-B, was a very conventional big wide-screen TV, and all such sets necessarily have much in common.

Since we do not have any links with Sanyo, we obtained a service manual from an agent of theirs. With that, a diagnosis was begun by Real Technician.



Dead set, intact mains fuse

The symptom here was a dead set, though the mains fuse F601 remained intact. In fact, RT found the full 320V charge on main reservoir capacitor C_{609} . He decided that this was going to be an easy one, simply due to there being no oscillation in the power supply primary circuit.

He measured 320V at the top of chopper FET Q_{613} , then switched the set off and – after discharging the reservoir capacitor – he then checked start-up resistors $R_{620,621}$, both 470k Ω .

They measured OK, as did 22 μ F bottom-end capacitor C_{613} , around which there were no short-circuits. Real Technician switched the set back on again and went into it with a DC-coupled oscilloscope. He discovered to his horror that the 320V potential was present at all three lead-outs of the chopper FET; this device turned

out to be short-circuit across all electrodes. Base feed resistor R_{624} (10 Ω) and current-sampler resistor R_{633} were both burnt open-circuit. Horror!

Where had the current to burn resistor R_{624} flowed from? Through driver transistors $Q_{611,612}$, which were open-circuit and short-circuit respectively.

What had the high voltage across the open R_{633} damaged? Sampling transistor Q_{625} , which was short-circuit, and resistor R_{613} , which had been singed, so to speak. Extensive testing of virtually every other component in the primary circuit of that power supply revealed no further damage.

After consultation with both Television Ted and Resident Workshop Sage, Real Technician ordered all the parts: four transistors and three resistors. They took a while to arrive, some having to be specially ordered from Sanyo via

their distributor.

Finally they arrived and were carefully fitted. RT replaced both 470k Ω start-up resistors as a precaution, along with the mains fuse, which had probably been strained. All the work was carefully checked before the set was plugged into the bench isolating transformer and switched on...

Pow! As the mains switch was closed there was a rasping buzz for a split second before the fuse at the bench-isolating transformer went out in a bright blue flash. RT's morale was as shattered as the fuse – especially when he found that chopper FET, fitted only a few minutes earlier, was now completely short-circuited like its predecessor.

Mercifully, this time R_{633} had held out, sustaining the current until the fuse blew and thus preventing repeat damage to R_{624} and the driver transistors. All these were once again now painstakingly disconnected from circuit and checked for shorts or leakage.

It seemed that chopper Q_{613} and the bench fuse were the only casualties of this second blow-up, so another power FET (2SK3102F) was hastily ordered. Even so, it couldn't be fitted without finding out why it had failed, could it?

Finally the cause of the problem was tracked down and eliminated. What was it? Not the line output transistor!

Find out on page 43.

In the post...



Welcome back Television!

First published as *Practical Television*, back in the 1930s, this magazine has provided a mainstay for the television servicing trade for over 70 years. For reasons best understood by the world of big business publishing though, it was unceremoniously consigned to the waste bin, the 'final' issue appearing back in January last year.

Unless I'm much mistaken, someone out there underestimated the commitment of its loyal readership. Thanks to all of you who took the trouble to express your dismay at its closure, our magazine is back – and under new management.

Make no mistake, from this point on you will be seeing a return to the articles and information that are appropriate to your interests.

I believe that *Television*, like this trade and those working in it, is special. We share a real passion for this complex subject of ours, one that has been facilitated by a publication, that has informed, educated and entertained us over so many years.

As well as providing access to readers' expertise and experiences it has, equally importantly, established a sense of community, the loss of which was felt acutely when it disappeared.

Might I suggest we do all we can to promote this magazine? Encourage colleagues to buy it, contribute to it and be proud of it. Through it we can all keep in touch... it's central to our success!

Peter Dolman – Melksham, Wiltshire

Ignorance of digital TV

Ring ring... "Hello, is that Mr Wright the aerial man?" "Well there are two. Do you want the old good looking one or the young efficient one?" "That's you isn't it Bill?" "Yes, you've

got me; sorry." "Ha ha!

"Well, what it is, Bill, we've bought a new telly and the reception's very odd. I think the aerial needs sorting out, and would you tune the telly in? We can't seem to grasp it somehow."

"Is it a digital telly?" "Err, I'm not sure about that. What do you mean exactly?" "Has it got digital built in? Can you get extra channels?" "Err, well... I don't really know... It cost £170 from Asda so it should be a good one."

And so it goes on. I've had this sort of conversation many times. The analogue switch-off has started in some parts of the UK. It won't seem like five minutes before it hits your area. Yet people come home with a new television set and, amazingly, some of them don't know whether it is analogue/digital or analogue only.

It isn't so bad when they buy a digital set without realising it, but with the analogue switch-off so close, it's a bit unfortunate that people can spend a lot of money on a TV set that won't receive digital.

Apart from the 'supermarket specials' there are still a few expensive TV sets on the market that have no digital tuner. Now you might think that the people who buy them are so stupid as to deserve no sympathy. But there are a lots of pretty bright people to whom the distinction between digital and analogue is only a faint smudge on their mental horizon.

Those who regard themselves as being pretty clued up on such matters should perhaps get a perspective on this by asking themselves a similarly crucial question, but one outside their area of expertise or interest. That hire car you drove for a week: was it front or rear wheel drive? That medication you're on: is there anything more

appropriate for your condition?

Clueless people must take some of the blame, but we're all clueless about one thing or another. It seems to me that the government needs to enforce the clear labelling of all new TV sets.

The switch to digital is arguably for the common good, but from the public's point of view it's something that has been foisted on them with no mandate. So the potential for an angry backlash is considerable.

To ease the transition and reduce national ire when analogue disappears, surely people need to be made aware now, at the point of sale and in a very unequivocal manner, that some new TV sets do not have digital capability.

I suggest that all new sets should have to carry one of two postcard-sized screen stickers. One sticker will be green, and will say "This TV set can receive both analogue and digital signals and is ready for analogue switch-off." The other sticker will be red, and will say "Warning! This TV set cannot receive digital signals and will need a digital set top box after analogue TV closes down."

Given the general public's dislike of extra set-top boxes and fiddly remotes these labels should have some impact. At least the great disgruntled will not be able to say "We had no warning!"

Bill Wright – Rotherham

Ex-Editor

As ex-editor of *Television* I would like to welcome Tony Greville's new *Television* magazine. Many will have missed their monthly 'fix' since *Nexus* decided to cease publishing the title. It provided, in particular, an informal means whereby those involved in

consumer electronics servicing could share their concerns, experiences and know-how. The present is a particularly trying time, when the technology is changing rapidly and it is difficult to obtain information on how equipment works and to obtain spares when required.

Television has a long and distinguished history. It first appeared, as Practical Television and Short-wave Review, in September 1934 – it was an offshoot of Practical Wireless. Both titles (and several others) were started and edited by F.J. Camm. It ran until October 1935 when, with the government of the day dithering about whether and how to start regular TV broadcasting, it became a supplement to Practical Wireless. It was revived, as Practical Television, after the war in 1951, when TV transmissions were spreading across the UK. The issues in the early thirties were full of information on mechanical TV systems and kits – it was still the Baird era – but the immediate post-war issues were concerned with valve technology for the EMI-developed 405-line system. ‘Practical’ was dropped from the title in October 1970.

The years following 1967, when colour TV broadcasting started in the UK, saw any number of major advances in the technology, especially the advent of semiconductor techniques, tape and disc video storage systems and cameras, satellite transmissions and, most recently, flat screens and digital TV. Throughout, Television kept its readers abreast of what was going on.

Sadly the UK ceased, several decades ago, to play a major role in the evolution of the technology. But we still need to know about it if we are to make the best use of equipment and, hopefully, be able to repair it. The new Television comes at a difficult time for the trade and those in it: but we surely need a magazine to help us cope with the changes.

John A. Reddihough – London W4.

The loft antenna

In the late 1950s a small light-engineering firm named ‘Wasp’, in Poulton-le-Fylde near Blackpool, produced an original design of loft antenna which was much used by the company for which I worked.

Originally they were made for Band I, Channel 4. As this was designed for the Sutton Coldfield transmitter, which was at extreme range, there were few local situations where reception was adequate.

Later when the Holme Moss transmitter opened on Channel 2, loft antennas became more attractive – especially since many local landlords refused to allow external antennas, both from aesthetic considerations and from fear of what local gales could do to a chimney stack with a large aerial assembly lashed to it.

These antennas were quite big. The Channel 2 version stood nearly man height. Usual practice was to erect it within the loft space then suspend it between the ridge-pole and a suitable anchor point on the ceiling joists below. After rotating it for best signal, it was secured with ties.

One winter, me and a lad were sent to do an installation in what we call ‘Boarding-House Land’. The building was a four-storey terraced property so a fair length of coax had to be dropped from under the eaves to reach ground-floor level.

Next would come a lot of shouting up and down the stairs as the direction was adjusted for best signal (405lines positive modulation – remember?) Portable field-strength meters were then very expensive and bulky.

After struggling through the ceiling-trap into the loft with the boxed aerial and erecting and connecting it we hung it temporarily and pointed it using a compass. I then went downstairs to look at the picture. It was poor. No amount of tweaking the direction made much improvement.

When I returned to the loft I noticed a small hatch in the wall

leading to next-door’s loft space so on a whim we dismantled the antenna, and moved it to next-door’s loft as an experiment. As the road was fairly steep, each succeeding property was stepped about 15 inches higher than its neighbour. When erected and tried there was a noticeable improvement in signal – so much so that we decided to go one more door uphill; in the spirit of experiment you understand!

While erecting the antenna in the third loft and looking for suitable anchorages we saw on opposite walls a couple of long wood battens carrying a number of rusty hooks and insulators and a few feet of corroded wire. These were the remnants of a pre-war long-wire or ‘Zeppelin’ antenna for radio. They would be ideal as anchor points for our ties.

As they were rather high, I made a back for the lad to climb up but he slipped and dropped with one foot between the joists. Disaster! When we got his foot out there was a hole through the broken laths into the room beneath. There was a single bed with wire spring and no mattress stood beside a chair and wash-stand in an otherwise bare and obviously unused room.

There was now the debris of about a two-foot circle of plaster which had descended onto the bed accompanied by the usual dust, soot and sand which accumulated in old seaside Edwardian roof spaces. Panic!

We pulled the broken laths back into place, dismantled the aerial and, closing panels as we went, returned to the original loft. We re-erected the antenna then explained to the owner that the signal could only be improved with a roof-top antenna and left.

A lady next door told me that the owners had gone away for the winter. I passed the house several times over following weeks but never saw any signs of occupancy. At Easter a ‘To Let’ sign appeared – so I never got to make my confession after all.

John C. Priest (address withheld!)

What a life

by Donald Bullock

As I was about to say when we were so suddenly and unnecessarily interrupted, if there's one thing I can't stand, it's having to man the workshop alone while Steven and Paul play truant. If there's another, in the cold light of a Monday morning dawn, it's being handed a so-called Digi-box in need of repair.

Greeneyes

Greeneyes clopped in with my mug of tea. She was smiling sweetly, and that worried me.

"They've got a lovely lime green costume in Marks..." she purred in her most expensive tones. "It's a perfect match for my peach stilettos." "You haven't got a pair of peach stilettos," I growled. "They're in Dolcis, next door to Marks," she said.

I turned back to the Digi-box, which was an Amstrad DRX400. 'No satellite signal is being received' its message insisted. So I opened it up to see why, and cleverly homed in on the power section.

As usual I tried prejudice before science by applying a finger to the side of C₈, its reservoir capacitor. It's a 470µF, 16V electrolytic, and it was cold and neglected. Moving in like a rabid bloodhound, I quickly found that its value had slipped to zero. It was there, but it wasn't.

The box's response after I'd fitted a new one would have warmed the heart of old Flayer Mincer, our late-lamented school-teacher. It jumped to life with an excellent picture which flew it to the top of the class.

Walter Wingnut

As I was boxing it up, a tiny thin wretch sidled in. It was the jug-eared

Walter Wingnut, the mixed-up Welsh soprano with the tin-opener nose.

"Ello, Mr Bullock!" he sang. "I've got old Miss Trimble's telly in the boot, can't it?" "I'll need an 'and to bring it in, though, don't they?" I looked through the door. His car was twenty yards away, the set was massive, and he was so slight that its remote control would have overburdened him. And it was starting to rain.

"Look, Walter" I said, "Reverse your car up to the door, would you?" He did, and ten rain soaked minutes later we had the set on the bench.

"It's very 'eavy, Mr Bullock, couldn't it?" he trilled. I nodded grimly and mopped my brow. "You won't take long, are they, Mr Bullock?" he said. "On'y I like Miss Trimble, you know." He winked. "She's my type, but doesn't know it yet. I could collect it after tea..." He sickened me, so I waved him out.

The set was an LG R128CZ10RX, the bulky monster which uses the B142 chassis, and it had only a blank screen. Upon opening it up, a single glance at its tube neck told me why. Its heater wasn't glowing.

Not being over-keen on changing giant tubes, I offered a prayer that my next check would show that its heater voltage was missing. It did, and I looked up in reverent thanks. The voltage, developed across a tertiary winding on the line output transformer is smoothed by R₅₂₉, which is located on the tube's tiny base panel. Checked on the panel's component side, there was voltage at both ends, but on the print side, one end read zero. It was dry-jointed, and properly re-soldering it restored the heater voltage and brought the tube to life.

But my joy was short-lived. The set's picture told me that all wasn't well, for there was streaming to the right of the horizontal scanning. (To the right, of course, since the tube's electron beam travels from left to right). And it worsened as the set warmed up. Back to the tube base panel I went, this time to find that R₇₀₉ had risen in value from its normal 220 ohms to 8.2k. A replacement cured the trouble and brought up an excellent picture, and I boxed the set up.

The Reverend Goode

The next minute a scruffy 1930s saloon car came sweeping and bouncing onto the front, covered in 1930s dust and making boxy noises. Out onto the running board stepped the kindly and bulky Reverend Goode, followed, as ever, by his impecunious little yes-man deacon, Curate Blande.

"Good Afternoon, Donald, my son!" boomed the Reverend as though I was his church. "God be with you!" He put a chubby pink hand to his ear. "Why, I do believe I can hear our church bells ringing! Can you hear them, Donald?" I could, so I nodded.

"Listen carefully, and you'll hear their message! They're calling 'Come to Church on Sunday, Donald... Come to church on Sunday...'"

"...church on Sunday, Donald..." echoed the thin voice of Curate Blande. Cruelly ignoring him, I beamed at the Reverend Goode like a true Christian. He glanced at the Curate, who was carrying a VCR/DVD radio 'combi', a Sony DAV D150G, and flicked his wrist like an impatient Oliver Hardy, and Curate Blande wandered forward and placed

the set on the bench.

"This machine belongs to the unfortunate Mrs Oldfield, of this Parish," said the Reverend. "I dare say you'll repair it 'on the house', so to speak. As you know, Mrs Oldfield spent seven months preparing every detail of the Summer fete, only to have the whole event washed out by the heavy storm while she was being swept away in the torrential Horsbere brook. Had it not been for Curate Blande here, who managed to secure her neck in the crook of his broly, she would doubtless have drowned."

"...doubtless have drowned..." mumbled the Curate. The Reverend looked disturbed, so I embarked upon a few sympathetic noises until he left with the Curate at his heels.

Mrs Oldfield's Sony

The radio worked well on Mrs Oldfield's nasty little Sony imp, but the DVD section didn't, and I soon found that it wasn't reading the disc. I recalled that Steven had already encountered two identical Sony's with the same trouble, so this made the third. The disc platform on this model is raised by a soft and pappy worm gear on the motor shaft, and this had split. As always, he'd ordered a few while at it, and we had a replacement to hand. When I'd fitted it, the machine worked well. But I was left wondering whatever had happened to the once celebrated Sony brand, so that it should use such an under-rated and predictably troublesome component in a product that bears the name that was once so celebrated for reliability.

I remember the apprehensions that we had, as service technicians in their early days, when we discovered that Sony engineering and quality control standards were so high that they deprived us of that well-known money-spinner, the stock fault!

I groaned when our next customer came striding towards our door. It was Mr Flighty, the ex-RAF type who

rather cares for the ladies. And at the same instant, Greeneyes came in with my mug of tea.

Mr Flighty

"Oh dear, here's that prat Flighty!" I said. Greeneyes reared up. Flighty flatters her every chance he gets, so she likes him. "You really *must* stop using that word 'prat'" she said. "It lowers you socially."

By now, Flighty was in the shop. "Why, what a treat to see a really pretty girl," he cried. What a tonic for my eyes!" Greeneyes fluttered her lashes and smiled. Then he turned to me.

"Good God," he cried. "It is Donald, is it?" I looked at him. "How you've aged!" he said. "Still, you're getting to look quite dignified! Can you still get about alright?" He put down the Samsung VCR/DVD recorder and a little portable Hinari television with it.

"What's up with these?" I snarled. He threw his head back and broke into a guffaw.

"Har-har, I rather care for that!" he chortled. "You tell me, old boy! After all, you're the engineer chappie! All I know is there's no picture!" By now Greeneyes had made out a job card, and I jerked my thumb at the door.

Flighty's trouble, recorder-wise (as they say) was that his recorder had no output via the scart connection. There was sound, but no picture or menus, and as the television set didn't support progressive scan, it showed no images. On the front of the recorder, though, was a tiny Progressive Scan button. I pressed it three times in succession, and a menu appeared on the set that allowed me to set the output to Interlace Mode. Having done this, it worked well with his set.

"So it was simply pressing that button!" said Greeneyes.

"Yup!" I said. "And knowing how to. It's Brain with me, not hot air! Do him an invoice, itemising a penny for

pressing the button, and £49.99 for knowing how." She flashed her eyes, dropped her arms to her sides and clicked her feet on the floor.

"You can't charge him fifty pounds!" she hissed. "That would be treating him like a – like a ..."

"Like something beginning with P?" I asked, sweetly. "You've got it in one, Baby..." I felt better now.

Mr Smallpiece

Our next caller was new to me. He was thin-faced and looked sensitive and timid, but I didn't care for his greeting.

"Smallpiece," he said. I looked at him and straightened up. "What's that?" I retorted. "Smallpiece," he said.

"You're sadly mistaken." I said. "I'll have you know that this is our family shop, and I didn't get where I am today by hav..."

"Not you," he said. "Me. I'm Victor Smallpiece. Can you mend my Goodmans 26in telly if I bring it in?" So he was offering money, not abuse! I smiled and nodded.

His set was a model LD2650HD, and as its name implied, it was a high definition model. It was stuck in standby though, and when I looked into its power supply I saw that C₃₃₀, the 1000µF, 25V electrolytic in its secondary circuit was bulging and looking sad. It had lost most of its capacitance, and read only 30µF. A new one did the trick, and the set displayed an excellent picture.

This problem has been featured in Fault Reports. It failed to help some readers.

Carelessly observed, this capacitor, C₃₃₀, can be confused with C₃₁₅, for this reference appears close to it on the panel.

In fact, though, C₃₁₅ is a tiny, low capacitance surface-mounted device on the print side of the panel. Replacing that won't help a jot.

To contact Donald Bullock please email enquiries@wheatleypress.com

Fault finding reports

Save time and money by benefiting from the experience of some of the repair business's most respected voices

For convenience, each report is categorised by its relevance to a particular appliance, e.g. TV, satellite, etc. In each appliance section, reports are grouped according to their author, whose name and details appear at the end of their respective report group. First off, Michael Dranfield...

TV FAULT FINDING

Bush IDLCD27TV006

The set would not come on and the front led was flashing. There was no start up voltage at the end of resistor chain R₃₀₄₋₃₀₅, both 150kΩ, but the resistors were OK. I found a low bi-directional reading across reservoir capacitor C₃₅₆. This fault was caused by the ICE1QSO1 chopper-control chip, IC₃₀.

Bush RF6684VPL

Bush's RF6684VPL is fitted with a version of the Vestell 11AK37 chassis and the set in question was tripping. This problem was traced to the BU2508AF line transistor Q₆₀₁ being short circuited.

The cause was a dry joint on the hot end of C₆₂₁, which is rated at 10nF/2kV. In addition, 10kΩ resistor R₆₃₉ and 47nF, 250V capacitor C₆₅₃ in the line-sync feed to the jungle chip had both burnt to a crisp.

After replacing these components, the set now came out of standby, but with no line drive. As the line-sync pulses feed the jungle chip and the microcontroller for OSD purposes, both these parts were suspect. However, replacements borrowed from an identical working set proved them to be blameless.

Eventually the faulty component was traced. The line-sync feed also goes to pin 5 of a small vertical sub

panel. Now this panel is not shown on the copy of the service manual I have. I found that the set seemed to work quite happily with the sub-panel removed!

The fault on the sub panel was found to be a shorted CD4538BCN chip, IC₁₀₀. I have since had another of these sets given to me by another dealer with an identical problem, which he failed to find: not surprising, as the faulty chip was not shown in the service manual!

Grundig M95-410-9-REF/PIP

This monster of a TV had intermittent sound. It had all the characteristics of set with a dry joint, however no amount of tapping would produce or cure the fault. After borrowing the correct service manual, I found the sound mute circuit was cutting in and out on its own. Replacing the two surface-mount transistors in the mute circuit, CT40061 (BC857B) and CT40066 (BC817-40), cured the problem for good.

Nakio N-2850W

I have had loads of these sets in with intermittent picture disappearing, leaving just the sound. Just touching the 'A1' control will sometimes bring the picture back on. Don't waste your time changing any bits because the problem's caused by the tube.

Altering the cathode calibration in

the service mode, or increasing the heater voltage are bodes you can try, but they are usually very short-lived cures. At the end of the day, you need a new tube, which in a set originally costing less than £200 is not economical.

Panasonic TX 21CK1

This TV came in with the complaint that channels could be tuned in but not stored. On testing it, I found that the height was also low and the RGB drives incorrectly set. This all pointed to eeprom corruption

I set up the eeprom but as soon as the set was switched to standby, the new values were lost. I ran the 24C16 prom through my programmer, which confirmed there was a verify error at location 1 – the eeprom was faulty.

It was still possible to read the eeprom but not to write back to it. So I read out the contents and programmed these into a blank 24C16 chip to use as a starting point.

When I fitted the chip back into the set, all the changes I had made the first time that had not been stored were automatically loaded from the microprocessor into the eeprom so no further setting up was required.

To enter the service mode set the channel to 99, turn the sharpness to minimum then press mute on the remote control and V on the front of

the TV. Use the V up and down controls to cycle through the service items, use +/- to make the adjustment, STR on front of the set to store and 'N' to exit the service mode when finished.

Philips 32PW9617/05

Here, if the red led on the front is flashing accompanied by a clicking relay, look no further than 470µF, 25V capacitor C₂₂₀₂ on the power supply panel; it will have dried up.

Sanyo CE28WN7-B

This set would trip out if you flexed the circuit board. It took a while to find this fault as it was an invisible dry joint. Reflowing all 128 pins of the surface-mounted TDA1202H jungle chip cured the problem.

Sony KV28WS2U

This set would reportedly change channel and turn the volume up and down on its own. When it was brought in I spotted the fault without even removing the back.

The set had come from a heavy smoker and was so thickly coated in tar that the fault could have only been caused by conductivity within the front panel buttons. All six were so badly affected that they had to be replaced.

They come in banks of two and are available from SEME under part number SON629.

Tar in television sets has a dramatic effect. It can cause the insulation to break down on the line transformer. Coils such as the IF tuning can drift off frequency and eeprom corruption can occur due to flash over from the anode cavity.

Vestell 11AK45 Chassis

Eeprom corruption on this model is very common. In fact, it's probably one of the most common problems.

When programming an eeprom from a known good file on this model you will still have to make

minor adjustments for geometry. etc.

Here's a tip. There are over 150 adjustments in the service mode. Always start by doing 10-11-12-13 first. If you don't do these four first, it will be impossible to set up the rest correctly.

Michael Dranfield

6 Caledale Close
Buxton
Derbyshire SK17 9RH

Philips 14PV220

"Set dead," was the complaint with this compact TV/VCR model. After confirming that the mains switch at the side was on – a common oversight – when the cover was removed, I quickly found that the primary side of the power supply was running. It was producing secondary outputs too. But when the HT rail was measured at the cathode of diode 6350 (on the component side of the PCB for convenience) the normally 94V expected here was low. It was varying between 60-65V.

As with most combi sets, servicing is difficult due to short cable lengths between the TV and VCR section. It is easier to remove the power/time-base PCB for cold checks.

I traced the trouble to diode 6342, an SBYV27-200, which was exhibiting a short circuit. This component is a power-supply secondary rectifier providing a 14V rail. A replacement restored TV and VCR operation.

This is one of the last models with the excellent turbo deck in its VCR section.

Thomson 28DG21U, ICC17 chassis

Two problems were evident with this 28 inch, 4 by 3 aspect ratio set: it switched back to standby frequently and the picture size was reduced all round.

I decided to switch it on initially to assess things, so I reached around

from the back to bring it out of standby from the on board controls. This resulted in a massive EHT crack and a rapid build up of static that apart from scaring the wits out of me caused the set to go into protection mode and produce error code 27.

Clearly the EHT was excessive. As the power supply section is incredibly reliable in this chassis, suspicion fell on the line-flyback stage so I checked this area for problems.

I found very poor and overheated connections at the 14nF, 1.6kV capacitor CL21 in this circuit. When checked, its value had fallen to 8.4nF. A replacement capacitor in this position cleared the problem.

On this occasion, I was lucky. The last time I had this problem in a similar set, the tube was destroyed when the value of the flyback capacitor fell to 3nF!

Ferguson WF70401 / Thomson 28WF45US, ICC20 chassis

This set would switch on and produce a red led indication. When a channel was requested, the led briefly turned amber. EHT was clearly evident, but almost instantly the red led returned and error code 25 was produced as the line stage shut down.

With this chassis, problems of this nature are commonly caused by a fault in the line flyback or diode modulator stages. On checking, I found very dry and overheated connections on capacitors CLO33 & CLO35.

Both capacitors exhibited normal values and no fault was found with any related components. I resoldered them and retried the set. You've guessed it; the fault remained.

The cure was to replace both capacitors. They were obviously breaking down under more stressful working conditions. This didn't surprise me as I had found out the hard way previously.

Capacitor CLO33 is 510nF/250V while CLO35 is 510nF/400V.

Philips 28PW6518, LO4E chassis

The owner of this set described how it appeared to switch on normally and the sound was present for about six seconds. It then reverted to standby before a picture appeared. He then had to switch it off and on again at the mains to get it to re-start.

These symptoms appeared exactly as stated when I tested the set. During the brief on time I noticed EHT and tube heaters were present but no G2 supply could be measured.

With the lead from the flyback transformer disconnected the voltage on it still remained zero, indicating an unusual internal transformer failure.

A replacement – part no 2422-531-98048 – put matters right. The six-second shut down was due to the highly sensitive protection circuit, which nowadays monitors previously irrelevant things – as far as protection is concerned – like tube current draw and warm-up time.

Sharp LC-22SV2Em 22in LCD TV

No teletext is a problem often associated with this model. Its cause and remedy are detailed on Sharp's technical web site. The problem is caused by cracked/dry solder joints on two SMD type ICs, IC₁₆₀₂, IC₁₆₀₃. It is recommended that they are resoldered as required.

Unfortunately, a couple of sets have come back to us after a few months with the same complaint. I contacted Sharp's technical department to check if any additional action was required for a reliable repair. They told me that the above-mentioned chips have particularly short legs and are subject to mechanical stress with the build up of heat.

It was suggested that this condition would possibly only affect a few sets where the chips had not been seated totally flat during production.

The most reliable repair action is to remove them, clean off the lands and refit them. Ensure that the seating is as flat as possible before resoldering.

I've carried out this action on two sets. Both are in everyday use and to date, neither has shown any further problems.

Another technical tip is mentioned relating to this repair. In these sets, the teletext processing works almost independently. Therefore if any pins are shorted when refitting, you simply get no teletext. All other functions plus picture and sound are normal.

Sharp 32JF73H, GA20 chassis

The unusual fault with this large, flat screen set was that although most of the time it produced an excellent picture, at other random times, it would de-gauss itself. This resulted in gross but brief impurity.

The customer noted that this could occur if she walked across the floor or closed the room door, etc. On test, I found this happened exactly as described, but I also heard a relay clicking on and off rapidly in time with the fault. This turned out to be RY701, which is used to switch in the AC supply to the de-gaussing components.

When I checked the voltages to this relay circuit, I was initially confused. The GA20 chassis print-out that I had indicated that RY701 is energised from a line derived 14V supply via resistor R₇₄₅. It remains on while the set is out of stand-by.

In stand-by, the line stage shuts down and the relay is de-energised to reduce power consumption in this mode. What confused me was that in my set, R₇₄₅ wasn't fitted. Instead, a small circuit with two smd type

transistors – Q₇₅₅, Q₇₅₆ – was connected to the relay. I then realized my sheet was for the 32JW model, which is a conventional tube type.

Although both models have the GA20 chassis fitted, this section is quite different. Voltage checks revealed that RY₇₀₁ was held on most of the time. It only went off when the chassis was flexed

I eventually figured out that in this model, it should only be biased on for a short time after start up but then turned off.

Relay RY₇₀₁ is connected to the emitter of Q₇₅₅, whose base is switched by Q₇₅₆. The collectors of both transistors are supplied via load resistors from the previously mentioned 14V supply, while the base of Q₇₅₆ connects, via R₇₆₉, back to pin 65 of the microcontroller (IC₁₀₀₁).

When Q₇₅₆ is switched on, the circuit is arranged so that Q₇₅₅ is turned off, removing the energising supply to RY₇₀₁. The problem lay in the path between the micro and Q₇₅₆. Here I found that by flexing the PCB to create the problem, the 5V source remained constant at pin 65 of the micro but came and went where it should connect to R₇₆₉.

Clearly a print crack between these two points was the problem and this was finally traced to a point midway along its length. At this point, the incredibly fine print line passes around a large soldered earth lug from a tall heatsink attached to component Q₆₀₃.

Linking this break cured the intermittent problem but it may well arise again in other sets as the heatsink is quite vulnerable. It could easily be forced when working close to this area and cause similar print damage.

Arthur Jackson

51 Moneygran Road
Kilrea BT51 5SL
Co. Londonderry

SATELLITE FAULT FINDING

Pace BSKYB1000 Javelin Minibox

Among the most common faults I have come across on this box are signal-related problems, usually causing freezing and breaking up when the box is hot.

As this box runs directly from a 12V power supply, most of the internal supplies are chopper generated. This is where the problems arise.

Excessive ripple on the input to IC U₂₉₀₁ causes the chip to break into oscillation and cause all manner of signal faults. First of all, replace C₂₉₂₁ and C₂₉₁₀. Note though that these are not ordinary electrolytic capacitors and need to be replaced with the correct type. They look like surface-mounted ceramic capacitors but are in fact 10µF 16V bipolar electrolytic types.

If only the vertical channels are available and the 18V horizontal LNB voltage is too low, replace C₂₇₀₈, which is rated at 47µF 63V. It may only be slightly low in value but the ESR will be found to be too high. Replace this only with a very-low ESR component. Farnell components in Leeds stocks a suitable range of high quality capacitors.

If you have intermittent 'No Satellite' signal and the box is slow at changing channels, replace C₂₀₃₁, which is rated at 100µF and 25V. Even a 25% drop in value of this capacitor will bring this fault on.

If the box is totally dead with a short across the 12V supply, look underneath the DC input socket. Here you will find D₂₉₀₀, which is a surface mounted 15V, 1W zener diode. This diode provides over-voltage and reverse polarity protection. A faulty 12V mains adaptor can cause this component to fail so check the output too.

Pace DS430N

I have had a few of these boxes where the satellite dish has been struck by lightning, resulting in no supply to the LNB. Usually you will find the one or more of the following components faulty. Rather than messing about testing components, it's usually easier to just replace the lot. They are;

Resistors R₂₇₁₅, R₂₇₁₆, at 2.7Ω
 Transistor Q₂₇₀₁, a BC856B
 Resistor R₂₇₁₈, 330Ω
 Transistor Q₂₇₀₂, a BC856B,
 Transistor Q₂₇₀₄, BC848B,
 Resistor R₂₇₂₁, 68Ω
 Transistor Q₂₇₀₃, 2SD1766,

If this restores the LNB supply at the emitter of Q₂₇₀₃ but there's still no voltage at the LNB 'F' socket, take a look under the front end screening can. You will usually find that the 10nH inductor L₂₀₆ has disintegrated.

If, after replacing this, the LNB voltage is back on but the box says 'No satellite signal is being received' you will also have to replace ZIF chip U₂₀₀, which is a CX24109.

Beware however if the box has been struck by lightning down the telephone line as this causes exactly the same symptoms. A message reading 'No satellite signal received' is displayed and you will find the LNB voltage missing.

This is easy to diagnose but more tricky to cure. In fact, the cost of repairing this damage is usually more than the box is worth.

However, there is a dodge. More on this later. Look at pin 1 of the modem isolation transformer T₈₂₀₀ at power up using an oscilloscope. The 4MHz power clock should run continuously. If there are only two bursts of the clock signal, you will have to replace U₈₂₀₀ (CX20493), Q₈₂₀₀ (FMMT458), and 27Ω resistor R₈₂₃₂ on the telephone line side.

This usually results in the

previously stuck in standby box and modem getting going again. If the box is slow to turn on, it displays the 'No satellite signal received' message, and the LNB voltage is missing then the 4MHz power clock will be missing.

Line-interface driver chip U₈₀₀₀ will be faulty as well as the components on the line side. This is usually indicative of a big lightning strike. Neither U₈₀₀₀ nor U₈₂₀₀ are easy to change.

Now here's the dodge. In this case, just removing U₈₀₀₀ will get the box going again but the modem will not be operating, and that means no interactive services.

Experience has shown that in the event of a big lightning strike, if removing U₈₀₀₀ does not get the box working again, it's usually not worth the repair.

Panasonic TUDSB31

Sent in by another dealer, this 'digibox' had no sound. I established that the PCM sound signal was exiting pin N5 of the BGA micro processor, and that the clock and sampling waveforms were present into the AK4317 audio digital to analogue converter IC₉₉₀₂.

Now this box has two identical digital-to-analogue converter chips; one for the off-air audio and the other for carrying audio from the modem IC₉₉₀₁. As a result, they can be interchanged if you suspect one is faulty.

This was not the case though as the audio was emerging from the d-to-a converter. Pin 17 is the right audio-channel output and pin 18 is the left channel.

From here, the audio path is quite complex. It passes through a series of BA15218 dual operational-amplifier chips fed from a split supply rail. However, the power supply only generates an 18V supply. So another op-amp, IC₉₉₀₃, is used to generate the split supply rail with virtual

ground. Here is where the fault lay.

On pin 8 of IC₉₉₀₃, the 18V input was found to be missing. Now this voltage comes straight from the power supply panel, pin 16 of connector A1.

The 18V rail was missing from here also. It should come from three-terminal regulator IC₈₀₅. This was not fitted though.

Then the penny dropped. The dealer must have originally had a power supply fault and fitted a new panel. But the new panel was from a TUDSB40. This looks similar, but it is not interchangeable as the audio circuits in the TUDSB40 are fed from the 12V rail. So although the circuit board is marked out to carry the 18V rail components, these are not fitted.

Amstrad DRX180

This fault took a while to find. At boot up, the box would only pick up half the listings and the signal meter was displaying no signal on either LNB inputs – even though ‘07D4 transponder’ was displayed. The fault turned out to be an open-circuit surface-mounted resistor R₁₁₆ with a value of 300Ω.

Amstrad DRX400

Here, the box was tripping but the power supply was not to blame this time. There was a 1.8Ω short to ground on the 20V rail. A small brown 100nF ceramic-disc capacitor, C₈₂₈, was found to be the cause.

Thomson DSI8210CS

If there's no RF2 voltage on the RF modulator – it should be 9 volts – replace chip IP₄ (LP2951) behind the RS232 socket. Access is a little tight but it is possible to replace this chip without removing the RS232 socket.

Michael Dranfield

6 Caledale Close
Buxton
Derbyshire SK17 9RH

AUDIO FAULT FINDING

Krell KSA50 amplifier

This 1980s power amplifier was reportedly producing hum on the right-hand channel. When I tested it, I found that there was a varying DC offset on the speaker terminals of the right-hand channel of around 2 or 3 volts.

Upon inspection of the right-hand channel circuit board, I discovered that several capacitors were leaking and the electrolyte had caused some corrosion of the circuit board. It had also provided conductive paths in and around the input stages of the amplifier.

I managed to get a circuit diagram from <http://home.ca.inter.net/~lloyd.maclea/Krell/Krell.htm>, which also contains links to other Krell circuit diagrams.

After removing the components from the affected area of the PCB and cleaning it thoroughly, I refitted the components and replacement capacitors. The capacitors were: C_{14, 15}, at 47μF/100V, and C_{1, 2}, which were 470μF/35V axial types.

This cured the fault and restored the right-hand channel to full working order. I thought I had better have look at the left channel board as well and found the same capacitors in almost as bad a condition. Accordingly these were also replaced and both channels soak tested.

Yamaha P4500 PA Amplifier

The ‘protect’ light on the front panel remained lit when this amplifier was powered up. I removed the top panel and was rather alarmed to hear a fizzling noise coming from one of the output stages. Fearing an imminent capacitor explosion, I hastily removed the mains lead from its socket.

I noticed that the output stage had some kind of clear liquid spilt on it. What this was I never discovered. It was odourless (at least to my nose!)

and it had a kind of slippery alkaline feel to it.

It was apparent after careful inspection that this liquid hadn't originated from within the amplifier, so I proceeded to clean it off, not only from the output stage but also from various other random parts of the amplifier. I then cautiously powered up the amplifier and was rewarded with nice click from the speaker protection relays.

The ‘protect’ light went off. In addition, one of the two cooling fans was making a loud noise as its bearing was worn. I fitted a new fan and tested the amplifier again only to find that one channel was intermittently shutting down and that the fans did not always run.

After poking about a bit, I found that the fans would stop and start when I pressed the power supply board with an insulated tool.

Out came the power supply board. On turning it over, I found several dry joints on the print side. I carefully went over the board with a magnifying glass and resoldered any joint that looked remotely suspicious.

After reassembling and soak testing the amplifier now proved to be fault free, thank goodness.

Denon POA4400A Amplifier

A nice easy one for a change! The complaint here was, “no power and no sound”. There were three fuses in the unit and all three fuse holders were loose and not gripping the fuses.

They had retained their springiness though, so I just squeezed the clips together with a pair of pliers and reinserted the fuses which were now gripped tightly. The amplifier then worked normally.

Soundtracs PC series 24 channel mixing desk

My heart always sinks when I get asked to repair a mixing desk with more than 16 channels. My

workshop is not all that large and, as I work on my own, I have problems moving equipment this size around the workshop.

In the event it turned out not to be too difficult to repair and the customer collected it quickly after the repair.

On bringing in the unit, the customer said that it buzzed on the main faders. What he meant was that there was a hum on the output from both channels. This hum increased from zero to moderately loud as the main output faders were turned up.

As the hum was at 100Hz, I turned my attention to the power supply, which is in a separate case. This provides several regulated supplies, two of which are +17V and -17V. The -17V supply had a significant ripple on it and measured about -22V.

Regulation is carried out by a T03 encapsulated 5A regulator, type LM388K. These are readily available from Farnell in Leeds.

After I fitted a new regulator, the supply was now at the correct voltage and ripple free. When the desk was tested, the hum was gone and everything was working normally.

Arcam CD73 CD player

This CD player was intermittently skipping. A common fault on these players is an intermittent flexible foil cable connecting the laser to the main PC board. This player proved to be no exception.

A new cable cured the fault. The cable on these players is far more likely to be the cause of disc reading and skipping problems than the laser, which is usually OK.

Mackie SWA1801 active speaker

In this case, the 'thermal' light was permanently lit on the amplifier module which was fitted to this speaker. Also, the output was muted.

Tests on the mute line showed that it was active. In normal use the mute line should be at -12V. This rail is generated by part of the power supply, which is on the input module.

There is a delay after switch on before this -12V supply is established to provide switch on muting until the amplifier operation has stabilised. In the event of the amplifier heat sink overheating, a thermal switch operating at 60°C closes and shorts the mute line to ground, removing the signal to the amplifier.

Active elements on the mute line are five J107 n-channel FETS. Their drain and sources are connected between appropriate points in the signal path and ground. In addition there is a further FET that turns the 'thermal' LED on and off.

In normal operation, the gates of these FETs are held at -12V, which turns them off. In mute mode, the voltage falls to zero and the FETs turn on, shorting the signal to ground with a drain-source on resistance of about 10Ω.

In the case of this faulty amplifier, the mute line measured about -2V, which is insufficient to turn the FETs off and hence the signal was muted. Two of the FETs proved to be leaky. Although the leak was only slight, the mute voltage was much reduced as the supply is via a 220kΩ resistor. Replacing the FETs cured the fault.

Incidentally, while the J107 FETs are available from Farnell, they are supplied via their associated USA company, Newark. Consequently, there's a handling charge of some £15 or so for each Newark order.

Crate BT220 bass-guitar amplifier

Intermittent cutting out was the complaint in this case. A soak test proved that the fault only occurred about once a day, which was not very encouraging.

Removing the chassis from this combined speaker and amplifier can

be tricky. There are five screws holding the chassis in. One is on the side of the cabinet and this must be removed first then the four on top of the cabinet.

At this point, the chassis may be slid back an inch or two, when it will drop down slightly and must be manoeuvred carefully under the guitar tuner, which is mounted in the top of the cabinet.

When the chassis is halfway out of the cabinet, the three way plug connecting the tuner must be unplugged. The chassis may then be fully withdrawn and stood on top of the cabinet as the loudspeaker lead is long enough to reach without disconnecting it.

Flexing the main PCB caused the fault to come and go so the board was extracted from the chassis and dry joints were readily visible on two 10W ceramic resistors, R₁₃, 23. These are used as voltage droppers for the ±15V supplies. After these resistors had been resoldered, the fault never recurred – even after a long soak test.

Refitting the chassis can be difficult as it tends to catch on the tuner module. If this is the case, the tuner must be removed first. This is achieved by squeezing lugs on the front and back of it which then allows it to be pushed upwards and out of the cabinet.

After the chassis has been refitted, the tuner can just be pushed back down into place as it is a snap fit. Don't forget to plug it back in while the chassis is still half out of the cabinet.

Isotek Mini Sub Mains Conditioner

I had never seen one of these before. It consists of a very solid and well made metal case with a row of six 13A sockets and an IEC mains input socket on the rear. It's intended to filter out nasties from the mains supply to your hi-fi system.

Inside, there are various filtering

components such as inductors and capacitors etc. The mains input fuse, a 6.3AT type, was blowing instantly at switch-on with no load connected. It seemed that some component was likely to have become short circuit.

This proved to be the case. The component in question was a bidirectional transient voltage suppressor; something else I had not come across before. There was one of these devices associated with each of the 13A outlets but only one of them had failed.

The type number is 1.5KE400CA. This device too is available from Farnell, as part number 9885056. Fitting a new one prevented further fuse blowing.

Quad 77 Integrated amplifier

One of the inputs here, source 2, was only producing an output on one of the channels. Other inputs worked normally.

I had no circuit diagram for this and I couldn't find one on the web. If anyone has one, I'd be grateful for a copy. So I decided to tackle the job without a diagram.

Each input had a OP275 op-amp associated with it. There was a bank of 4066 switching ICs to handle input and tape output selection.

Comparing the voltages on the op-amps showed that while most of them were the same, the one associated with the source 2 input,

namely IC₁₆, had completely different readings.

Pins 1, 2 & 3 – which are non-inverting input, inverting input and output respectively – all had 7V on them when they should have been at zero volts. Replacing this op-amp cured the fault.

Fender Stage-160 guitar amplifier

This guitar combo was producing a loud 100Hz hum but otherwise worked normally. Fortunately the cause was nothing more than dry joints on the reservoir capacitors. Resoldering these provided a cure.

HK Audio D.A.R.T active Speaker

This job was a reminder of the necessity of making a careful note of where wires are connected before disconnecting them, and the disastrous consequences that can follow if this is not done.

There was no audio. The unit consists of a bass unit and tweeter driven by separate bass and treble amplifiers. After removing the chassis, I was not surprised that there was no audio as somebody had confused the connections from the tweeter with the connections to the bass amplifier power supply.

The tweeter was connected directly across the power supply and the bass amplifier supply input was connected to the output of the treble amplifier!

As you can imagine, the tweeter voice coil was fried. I reconnected the bass amplifier to its power supply and powered up the unit. This proved that there was no fault in the bass amplifier, which worked normally.

I then ordered a tweeter diaphragm and turned my attention to the treble amplifier. This initially worked OK but developed an intermittent crackle after some time. This was probably the fault that the previous repairer was attempting to trace.

The cause turned out to be breaks in the legs of the treble amplifier output IC – type LM3886T available from Farnell. The tweeter took a couple of weeks to arrive but after it and a replacement IC had been fitted the unit performed as it should.

Denon DCD825 CD Player

This player would not read discs. After inspection, it was clear that the disc was not being clamped fully as the loading cycle was not being completed due to a slipping loading belt.

A new belt and a lens clean completed the repair. Denon spares are available from Charles Hyde & Son.

Andrew Beynon

Abacus Electronics

Leeds

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Flat-panel TV faults extra

Repair expert Charles Arundel describes a selection of symptoms and remedies for Daewoo flat-panel TV faults



DAEWOO Analogue/Digital LCD TV Model DLT32C3FTB

Note. This set uses the SL500 chassis – not to be confused with the model DLT32C3 that uses the earlier SL230 chassis.

Fault. Set works fine in Analogue mode but goes into stand-by mode as soon as it's switched to Digital TV Mode.

Cure. A few early production models with serial numbers beginning PT075E09 had this problem because the software in the EEPROM was not set correctly during production.

To overcome it you need to obtain a Service Remote Control type R-34SVC from Daewoo Electronics. Next, switch the set to Analogue mode. There's no need to tune in any channels.

Now press button S9 on the service remote control. This will bring up a list on the screen. Use the channel up and down buttons to select 'Memory Recall'. Now press the Vol > button. After five seconds the memory will clear and any pretuned analogue channels will be deleted.

Press S9 on the service remote control twice to exit Service Mode. Now when you switch the set to Digital mode it should not go into stand-by.

DAEWOO Analogue/Digital CRT TV Model DUB2850

Fault. Intermittent loss of picture on any of the ITV group of channels, ITV1, ITV2, ITV3, FILM4, etc. The BBC and other channels don't lose their pictures.

This situation has occurred since ITV went interactive with its advertisements last November 2006. It is due to the software in this model being upset.

Cure. Most sets will have been

automatically updated by an 'Over Air Download' that occurred each month until recently.

However, those that missed the download can still be updated by requesting a software update flash card with adaptor from Daewoo Electronics. After ensuring the set is tuned to a digital channel, insert the Flash card into the set's 'Conditional Access Slot', or CI, at the rear of the TV and power on.

An OSD banner will now go across the screen saying "Erasing software". When the procedure is completed another message saying "Installing new software" will appear. After this process is completed, you have to rescan the digital channels and the fault will be cured.

The latest software should be version 2.4.122 or 2.3.103. Either will cure the problem. You can check if your set has this software by selecting the digital TV DVB menu on the TV using the customer remote and then selecting 'Settings' and then pressing OK button twice.

DAEWOO Plasma TV produced for SKY TV

Note. This TV was produced by Daewoo but never sold via the Daewoo sales department. Therefore it has never been available in the shops. It could only be purchased direct from SKY TV. For this reason, it was not supported by Daewoo's spares department. As a result, technical advice on this product is not generally available.

Fault. Daewoo has received numerous requests for Technical advice on this model. Every fault so far has been a distorted picture, caused by a faulty video PCB.

Cure. The cure is to replace the video

board. It looks like one used in a UK model plasma TV but it is not the same. The board for this SKY plasma TV is not available from Daewoo spares department in the UK. You will have to email Mr B. R. Lee in Korea whose address is brlee@dwe.co.kr. He is able to supply the necessary PCB.

DAEWOO DVD/VCR recorder combination Model DT8150P

Fault. When the set is in 'E-to-E' mode, there are multi-coloured lines – like those caused by digital noise – on the screen when trying to record onto DVD. There is no picture.

Power supply voltages are correct. The MPEG board is known to suffer from dry joints. Replacing it however does not cure the problem.

Cure. I first replaced the complete DVD loader assembly but to no avail. In desperation I replaced the complete video board assembly. Still no cure.

So the only board left – the power board – was replaced. This cured the problem.

Voltages on the replacement board, when compared with the faulty board, were the same. Further investigation using an oscilloscope on the 2.5 volt supply showed a very small amount of noise when the gain was turned up high.

Something was obviously amiss. Eventually, the fault was traced to a faulty capacitor, circuit reference C₈₂₁ 1000µF/16V. A replacement device restored normal operation.

This component's capacitance read correctly. Using an equivalent series resistance, or ESR, meter though, it read 1.2 whereas the new capacitor read 0.2.

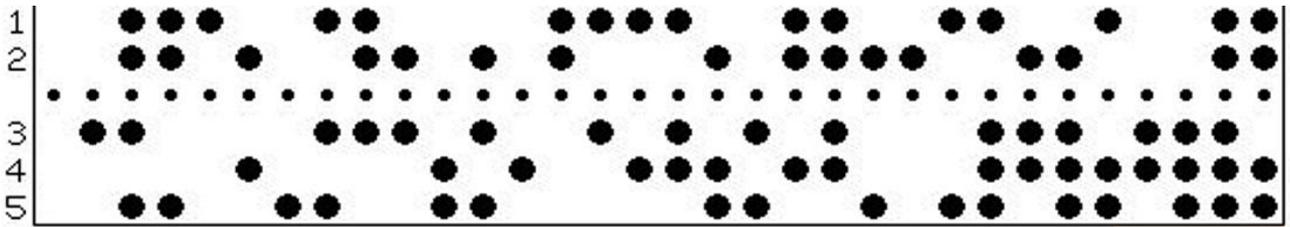


Fig. 3

Murray Code

Introduction to digital transmission technologies

by J. Lejeune

I've been heard to say, countless times, that in many instances there is nothing new under the sun. In the case of digital transmission this is certainly true.

Before speech and music could be sent over wires or over the air, communication over great distances was achieved by using codes for each letter of the alphabet and numerals 0 to 9. At first the Morse Code was used. It found ready application in electric signalling and by flashing a light. Codes had to be used because the concept of modulation was not

yet developed. The only means of conveying information was by on-off signalling.

Morse Code used combinations of short and long pulses, 'dots and dashes', to represent the letters and numbers, *Fig. 1*. The pulses were derived from a momentary switch known as a 'morse key'. Pressing the key caused current to flow in the line. Reception of the code would be signalled by a lamp, buzzer, etc.

On long-haul telegraph routes, a single-wire line was used with an earth return. Instead of making

contact to signal the dots and dashes of the code, the circuit was broken intermittently instead. This allowed a small degree of supervision, for if the line was broken at any point the DC used for signalling would be absent, indicating a fault.

At the receiving end a 'sounder' was used. This merely made a clicking noise, but experienced telegraph operators of the day could 'read' the clicks and decode the message. The sounder had a high sensitivity. Its ability to respond to weak line currents allowed long lines to be used.

Later, the sounder was replaced by a relay that could switch higher currents and operate an ink. The ink was a primitive pen recorder that scribed an undulating line along a moving paper tape. In fact, an alternative name for an ink was an 'undulator', *Fig. 2*. Messages received by this method could be stored and decoded when it was convenient – for even in those days, around 1850 to 1870, operators needed to use the toilet occasionally!

For intercontinental communication, the code signals had to be boosted *en-route*. This was done at the repeater stations, where incoming messages were decoded and re-transmitted – 'repeated' – to

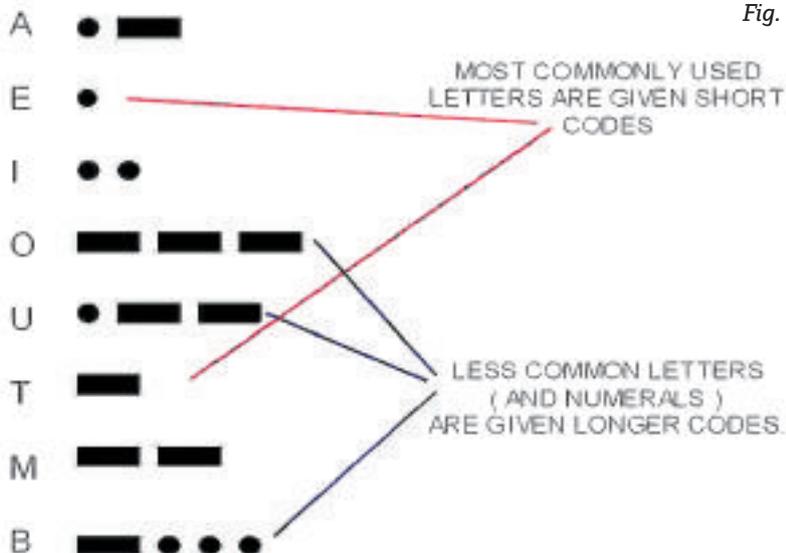


Fig. 1

Morse Code



Fig. 4

Teleprinter: Creed 7 series



Fig. 2

Inked tape

the next station in the chain. Thus the term 'repeater'.

Although morse-code operators could achieve speeds of up to 40 words a minute by using tone signalling and typing the message directly onto paper for delivery or distribution, telegraph companies began to seek automatic means of transmission and reception. For this to work properly each code 'symbol' had to be of equal length. Eventually, this gave rise to the teleprinter.

Teleprinters used a $6\frac{1}{2}$ -unit code and ran at 50baud or 66 words/min. The most famous teleprinter was the Creed 7B, but the model 7 range as a whole had a production life of 38 years during which in excess of 101 000 machines were made. It was

entirely mechanical, but embodied principles that have been translated into electronic processes to-day, including a look-up table made then of notched levers that converted the 5-bit Murray code payload into

letters and numerals. **Fig. 3.**

Transmission of Morse signals was normally achieved by turning on and off the unmodulated carrier of a radio transmitter. At the receiving end, incoming bursts of carrier could be converted into tone signals using a beat-frequency oscillator, making them audible. The oscillator would be adjusted to have a difference frequency of about 1kHz from the radio receiver's intermediate frequency, or IF.

As the signals occupied an extremely narrow bandwidth, signal-to-noise ratios were extremely high and for this reason Morse

Code was used commercially until about five years ago to 'get through' where other methods failed. Teleprinter signals use a form of dual frequency tone transmission in which a 2125Hz tone signals a 'mark' or high level and 2295Hz denotes a 'space' or, as we say in to-day's digital domain, a 'low'. This form of transmission was termed 'frequency shift keying' or FSK. At one time radiotelegraphy, known as RTTY, signals could be heard across the short-wave bands away from the broadcast frequencies. Their familiar warbling tones would carry commercial and governmental traffic as well as the latest news from the big news agencies such as Reuters and AP. The teleprinter was also used initially as a keyboard input device and printer output with the early computers like Colossus and Eniac. **Fig. 4.**

The fact that digital communication has been around for a long time, it is hoped, will make the subject of modern digital transmission technologies less daunting. Much of the spoken and written word on digital subjects is almost in another language. Some say it was done intentionally by the early digital developers to shroud the simplicity of digital electronics in mystery, the aim being to deter analogue-oriented engineers from encroaching on their domain! In this series we shall endeavour to dispel that aura of mystery.



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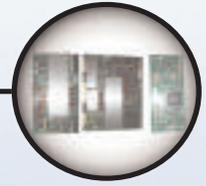
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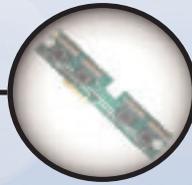
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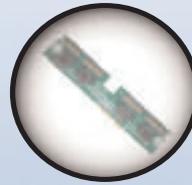


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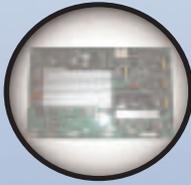
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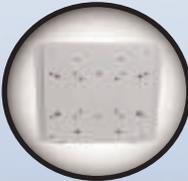
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 Suitable for screen sizes 14" - 37"
 VESA 75 , 100 and 200 compatible
 Max Load 25kg

Order Code : LCDBKT15S
Price : £ 11.00 + vat
 Carriage Charged at £ 5.00 + vat



Simple but very robust wall bracket for mounting Plasma or big LCD televisions to the wall in one fixed position
 Display Size : 30"-50" - Max. weight : 60 kg
 Colour : Silver
 Distance between TV and wall 2,5 cm

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Price : £ 20.00 + vat
 Carriage Charged at £ 5.00 + vat

This Tiltable wall bracket can be used with most Plasma and Large LCD televisions with a 15 degree tilt action
 Display Size : 30" - 60"
 Max. display weight : 75kg
 ±15° Tilt

Order Code : PLASBKT1S
Price : £ 35.00 + vat
 Carriage Charged at £ 5.00 + vat



This plasma bracket can be used with most plasma and LCD televisions, due to its universal mounting possibilities
 Safe and heavy duty construction and easy installation
 Tilttable : No
 Display size : max. 61" (155cm) - Max. Weight : 80kg

Order Code : PLASBKT4S
Price : £ 35.00 + vat
 Carriage Charged at £ 5.00 + vat

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3 m	HDMI3/Q	£15.00 + vat	£10.00 +vat
5 m	HDMI4/Q	£20.00 + vat	£15.00 +vat
10 m	HDMI6/Q	£30.00 + vat	£20.00 +vat
15 m	HDMI7/Q	£50.00 + vat	£30.00 +vat
20 m	HDMI8/Q	£65.00 + vat	£38.00 +vat

Bulk prices apply when 3 or more of the cables are purchased

Gold Plated Terminals - Double Shielded Cable - Supplied in attractive retail packaging
 Carriage charged at £ 2.00 + vat or £ 5.00 + vat for 3 or more

Split a single HDMI signal without loss or quality of signal
 Supports HDCP , 720i, 720P and 1080P resolutions
 Available in 2 , 4 and 8 way
 For an optimal sound and image use the high quality HDMI cables above

Item	Code	Old Price	New Price
2 way	HDMIDIST2	£100.00 + vat	£65.00 + vat
4 way	HDMIDIST4	£150.00 + vat	£80.00 + vat
8 way	HDMIDIST8	New Item	£200.00 + vat

Carriage at £ 5.00 + vat



Grandata is moving !!

As part of our continued expansion , from the 1st January 2008 will be operating from our new premises in Ruislip.
 Please make a note of our new address & contact numbers.
 Please also note that we will be closed from the 24 Dec 2007 to 2nd Jan 2008 to facilitate the move.
 We wish you a Merry Christmas and Happy New Year and look forward to your continued support.

* Please add £1 p+p and VAT to all orders (Unless Otherwise stated) * All components are brand new * We accept payment by Credit Card ,Cheque & Postal Order * All prices quoted are subject to availability and may be changed without prior notice E & OE

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Long-distance television

by Keith Hamer & Garry Smith

Welcome to this first Long-Distance Television column of the new-look *Television* magazine. The subject of long-distance television – known as DX-TV for short – reception has been a firm favourite from the 1960s when it appeared as a regular column in *Practical Television* by the late Charles Rafarel around 1963 and continued from the summer of 1971 by Roger Bunney. Roger is concentrating on satellite TV issues in the re-launched *Television* magazine which means that we have the honour of presenting a new DX-TV column covering various aspects of the hobby. We hope to continue the fine traditions laid down over four decades by Charles and Roger.

Early Encounters

Prior to the regular column launched by Charles, there were various articles about receiving Continental TV signals. Even in the Fifties there were reports of 'foreign sound and pictures' breaking through, particularly affecting BBC viewers in fringe areas whose reception was influenced, or in some cases dictated by, the weather. Disruptions during the summer months by Sporadic-E ionisation were quite common and when dual-standard TV receivers were introduced in 1964 for the introduction of the new BBC-2 network on 625 lines UHF, it was not uncommon for TV engineers to tinker with the system switching to view the invading signals on VHF 625 lines in Band I.

The interest in the hobby has waxed and waned over the years but there are some 'die-hards' who have been 'at it' since the late Fifties. We'd love to hear about how you first became interested in the hobby and what your initial encounters of foreign TV reception were.

Is DX-ing dead?

With countries switching over to digital, one may be excused for asking the following question: "is DX-ing dead?" The answer is definitely a resounding 'no' but the hobby is set to be more of a technical challenge. How many of us experienced our first encounter of long-distance TV with Spanish bullfight scenes received on nothing more than a length of standard wire as a make-shift aerial?

At the time of writing, the Spanish Madrid power-house on Channel E2 is still radiating TVE-1 programmes but, sadly, such sources of strong signals will one day be gone for good. As European channels become empty, they will be wide open to signals arriving from other Continents. The emphasis will be on the capture of 'exotic' signals from further afield which have eluded us so far, or were blanked out by all-day Spanish openings at overload strength. Channel E3 shares its vision frequency with that of the American channel A2 (55.25 MHz) so this will be the channel to monitor next summer.

While writing this column towards the end of October, a massive Sporadic-E opening occurred on the 27th and 28th. Pictures from

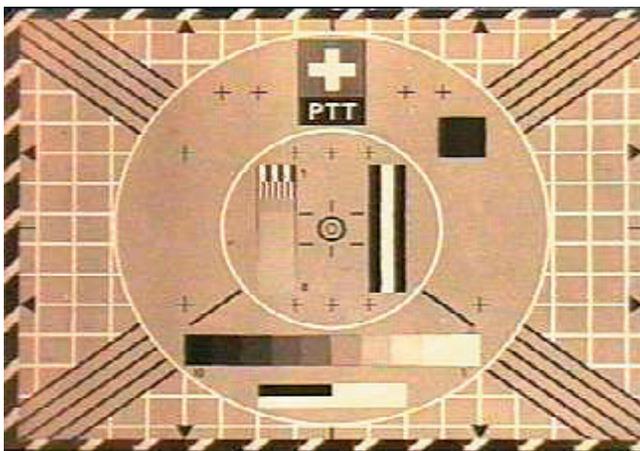
Germany, Switzerland, Croatia, Moldova and the Czech Republic were poised on the screen at strengths comparable to those encountered during the main summer season. Such out-of-season openings can occur without warning so it pays to be on the alert and keep monitoring even if conditions seem quiet. October has also seen a period of settled weather conditions which has resulted in tropospheric enhancement affecting both the TV and FM bands. FM stations have been heard from as far away as Bavaria and Scandinavia.

DX Newsdesk

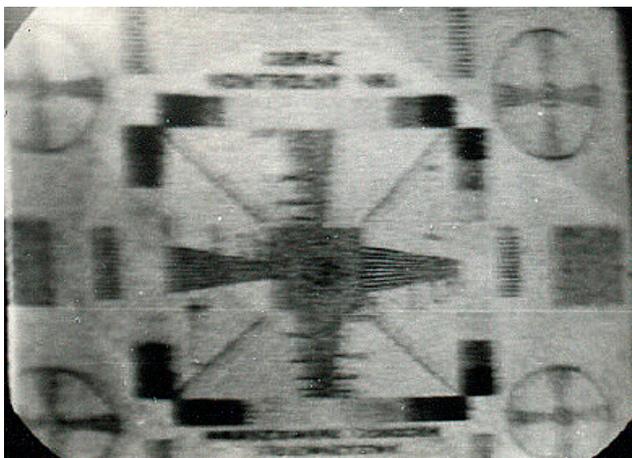
Scandinavia: Finland and Sweden have now switched off their analogue networks which means that the reception of transmitters such as Tervola E3, Vännäs E2 and Stockholm E4 are a thing of the past. It is obviously good news for Scandinavian DX-ers as the channels will be clear for DX-ing, the Middle East being a prime target next summer.

Poland: The changeover to digital terrestrial broadcasting will probably begin next June. The parallel broadcasting of analogue and digital TV is set to continue for the following twelve months with the complete switch-off of analogue occurring sometime in the middle of 2009. However, this will not affect us much as TVP-1 deserted Band I a number of years ago!

France: CSA, the country's broadcasting regulator, has announced new sites for the expansion of digital TV. Some 65



The unique Swiss test card radiated by the +PTT from the late 1950's until the commencement of colour in 1970. A set of Colour Bars was superimposed for a relatively short period before the FuBK colour test card was introduced



A dramatic-looking test card from Poland, received in the late Fifties



A Bush TV125 dual-standard receiver displaying a Yugoslavian identification caption (TV Beograd) circa 1972



West Germany with a caption heralding the daily News programme, received on June 26th, 1959

digital terrestrial transmitters will come on-air by around March 2008. This will allow all French regional centres to receive digital terrestrial services. It is anticipated that more digital transmitting sites will be announced shortly by the CSA so that by the end of the year there will be a total of 250 outlets in operation.

This month's DX Newsdesk was kindly supplied by Gösta van der Linden (Rotterdam) and the Benelux DX Club.

Feedback!

Please send news, comments and any off-screen DX-TV photographs, particularly any unusual test cards and captions, to:

Garry Smith, 17 Collingham Gardens, Derby DE22 4FS.
Our E-mail address is: Television@dx-tv.fsnet.co.uk

If you are interested in archive TV, test cards and identification captions, check out our website at www.test-cards.fsnet.co.uk via the Internet.



The ubiquitous Philips PM5544 electronically-generated colour test card hit our screens in 1970. Almost forty years on, it is still in use

Book review

Repair Guru Eugene Trundle is impressed with Fawzi Ibrahim's new rendering of the long-established favourite, TV and Video Technology Guide

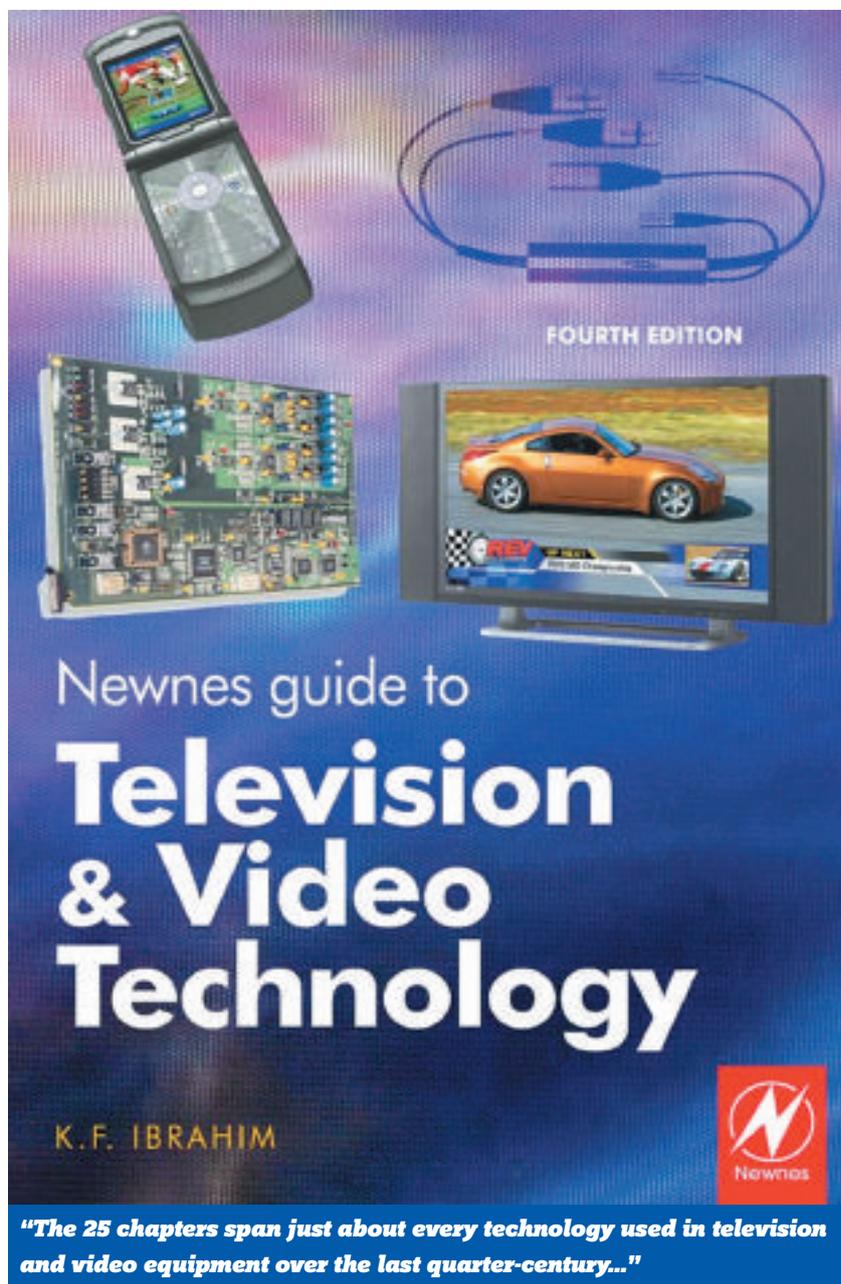
Readers of Television magazine need no introduction to author Fawzi Ibrahim: he has often contributed to these pages.

This particular book title will be familiar to many of you. It began almost 50 years ago, under the hand of the redoubtable Fred J. Camm, and has had two other authors over the years.

The new edition runs to 586 pages, eight appendices and several hundred illustrations, topped off with a comprehensive index.

The 25 chapters span just about every technology used in television and video equipment over the last quarter-century. From such fundamentals of TV as scanning, interlacing and analogue carrier modulation, the reader is guided through the principles of light and colour, NTSC and PAL encoding and CRT-type TV. Analogue reception, colour decoding, mono and Nicam sound and switch-mode power supplies are also discussed.

Similarly the video tape coverage is comprehensive, getting right down to



the basics of magnetic transfer and helical scanning.

VHS and Video-8 systems are described and illustrated in depth, leading on to the DVC and Digital-8 formats. DVD playback gets a chapter to itself, with brief reference to the new high definition variants

Blu-ray and HD-DVD which are now getting about.

All of these are excellent for reference and to help in repair and service of what might now be called 'legacy' equipment.

The real value of this book though is in its coverage of current

“The real value of this book... is in its coverage of current technology: flat screens and digital equipment...”

technology: flat screens and digital equipment.

Display technology

Plasma display panels are generally more difficult to repair than CRT-based televisions for various reasons, one of which is a dearth of information on them! This is addressed in Chapter 10 of the book, with 30 pages and 36 illustrations devoted to working principles, construction and drive techniques for both progressive and ALiS types.

Also in this section are useful tips on fault diagnosis, with off-screen photos of various symptoms.

The next chapter provides similarly comprehensive guidance to LCD screens. It starts with the theory and moves on to drive circuits, colour filters and there's good coverage of backlight systems – one of the most troublesome sections of this type of display.

Again this chapter concludes with fault-finding hints and photos of real faults as manifest on screen.

Projection technology is covered in the next chapter. The Digital Light Processor, or DLP reflector, which is used in both front- and rear-projectors, is described in both single and three-chip form. SED (direct-view, Surface-conduction Electron-emitter Display) is also briefly described here.

TV data processing

While the screens themselves, with high voltages, backlights and multiple fragile inter-panel connectors, may be the focus of interest and the commonest fault

area, the digital circuits involved in TV data processing, scaling and management are also less familiar to technicians than (obsolescent!) analogue circuitry.

These topics are covered in Chapter 16, where video formatting, scan-rate conversion and HDMI coupling are tackled: clear descriptions of the principles are backed up by details of practical systems in the form of chip sets by Philips, Panasonic and Samsung. There are block diagrams of the devices used and their interfacing with memory and control sections.

Following these are details of specific PSU designs for flat-panel TVs. Then some very practical information on fault-finding in both

plasma and LCD receivers.

DTV reception is the subject of Chapter 18. It's addressed regarding both terrestrial and satellite systems. And it is relevant to both IDTVs and set-top boxes. Cable TV is briefly dealt with in its own chapter elsewhere.

The coverage relating to DTV reception consists mainly of block diagrams with detailed descriptions. Some generalised guidance is offered on testing complete receivers, decoders etc; and on memory chip types, functions and failure modes.

Off-screen symptom pictures are included too.

TV storage systems in DVD form are the subject of Chapter 20 (playback technology). This chapter is backed up by Chapter 22, where optical disc recording is described, but without the fault-finding advice which distinguishes the TV chapters.

Digital sound – mainly with-vision – is delineated in Chapter 6, while other sections are devoted to DTV generation, encoding and transport streaming. HDTV gets a chapter to itself, with coverage of MPEG4/H.264/AVC.

The concepts, principles, practice and hardware of computers and TV systems, now that the latter are in digital form, are becoming closely entwined. This alliance comes under the spotlight in Chapter 24, “Multimedia convergence” This is an interesting read indeed.

The final chapter – on hook-up – is a very practical one. It embraces analogue and digital ports and cords, with pinning diagrams and waveforms.

“For less than the price of four packets of cigarettes, it will pay for itself with the first successful repair it fosters...”

Bargain book

New books on video/TV subjects are seldom seen now. This one ticks a lot of boxes for technicians – and others.

For less than the price of four packets of cigarettes it will pay for itself with the first successful repair it fosters – a bargain at £19.99.

This book is available from the publisher, Elsevier, on 01865 474010 or at www.newnespress.com. Its reference number is: ISBN 978-0-7506-8165-0.

Every month AD Lyon sums up the highs and lows of life in the Oxford TV service trenches



The Lyon's Den

“Reg also has very deep pockets and short arms to go with them”

It was a really cold Wednesday morning. The sky was totally clear and frost was sparkling on the shutter door. This is the first real frost of the year I thought to myself as I struggled to get the bolts out of the shutter.

Inside, the shop it felt colder than it was outside in the car park. I reluctantly told myself that despite the costs in electricity I will have to make sure that some heat stays on all night. I don't like this time of year it's so expensive.

While I waited for the heaters to

come on, I thought I'd have a cup of tea, so on went the kettle. I got as far as pouring the water on the teabag when the phone rang. “Zis iz fraulein Hoch,” said a person with a strong German Accent, “can you tell me if ze Gas man vill vant to unplug my Television tomorrow when he comes to fit ze new gas fire?”

I didn't really know how to answer that one to be honest, but I gave it a shot. “Well it may be better to ask the gas man when he actually arrives: I would think he'd know wouldn't he?” “No I am asking you I want to make preparations in

advance yes?” Well in the interests of customer service I ran with it for a while longer.

I thought for a moment and then came up with a brilliant question: “Is the TV anywhere near the place that the fire is going to be fitted?” “No it iz not but ze plug on ze vall iz near ze fireplace.” I was bored with this conversation now and told her that the only person who could answer her question was the gasman himself.

Fraulein Hoch exploded with a volley of verbal abuse and told me that I was the third TV man she had spoken to about this and none of us could answer her “simple question”. All English TV men are “rude and stupid” she said. Then she put the telephone down on me and all was peaceful again. My cup of tea though



had stewed for long enough to make it undrinkable so I started again and switched the kettle back on.

The door opened and in came Reg the plumber; he's a regular customer near to retirement age now and can talk the hind legs off a donkey. Reg also has very deep pockets and short arms to go with them; yes he is the kind of customer who hates spending money.

Under his arm Reg was holding a 20in LCD Techwood, model 20LC1. I've learned to just listen when Reg speaks because if you interrupt or

try to ask question things just take longer. He began what was to be an even longer speech than normal by telling me how he had just finished a big job for the council and done really well out of it. Then we went through last year's holiday in California – a story I'd already heard twice. He told me all about his gout and his in-growing toe nail. I could see the TV was starting to weigh heavily under his arms now so guessed we may be nearing a conclusion to his speech.

It turned out that the TV had

come from one of Reg's customers. He had just fitted them with an *en suite* and they were throwing it out because Ropy's Repairs in town told them 'the tube was dead' and the best thing to do was bin it!

After Reg left, I took the back off the Techwood, which was not an easy job in itself. It clearly hadn't been removed before. Being an eternal optimist I did a cold check on the fuses. They were all intact.

I switched on the set and noted the fault symptoms, which were sound but no picture. In the old days this would have been easy. It would have been frame collapse or maybe a dry joint in the heater circuit. Now though things are much more complex, or are they?

I moved the 'scope probe around the inverter board to see if there was any high-frequency activity. There wasn't. I checked supplies to the board; they were all marked on the pcb and were all present.

Next step for me was to shine a maglite torch onto the screen – in the background I could see a faint picture; obviously the inverter board had failed. I thought that this would probably be very expensive and would likely

write the set off. For the cost of a call though, I thought it would be worth ringing our supplier for a price. I was amazed by the reply. Yes sir we have those in stock at £21.79. Would you like one?

The board arrived next day, was easy to fit and provided a complete cure. Maybe it's not all doom and gloom after all. Time now for that cup of tea I thought.



How to Satellite DX

by Roger Bunney

The first *Television* magazine first appeared within the 'Practical Wireless' publication after World War 2. With the expansion of BBC Television, initially in London and then to the Midlands, increasing interest in television resulted in the birth of the stand alone 'Practical Television' to support the emerging home technology.

Practical Television supported and informed the viewer, the enthusiast and the TV/radio retail and servicing trade with the latest advances, the engineering know-how, the transmitter network and even how to make the latest high gain antennas. The pages of course were jammed full of advertisements for home construction kits, components, rebuilt tubes and valves.

The mid fifties saw the arrival of commercial television. Over the next 10 years this medium rapidly expanded over the UK offering dual-channel reception – and then dual-standard receivers [405/625 line] with the arrival of BBC-2 on UHF. Colour followed within a year or two plus more UHF channels. The pioneering 405-line system closed down in the mid eighties and then satellite TV controversially took the stage.

Satellite standards battle

Not unlike the Beta versus VHS battle, a short lived battle raged for supremacy over transmission formats. Rupert Murdoch's Sky transmissions – with cheap analogue satellite receivers for the 30 or so channels won over the rival BSB D-MAC with only five channels.

Sky also pushed the digital frontier

with the adoption of digital transmission and the closure of Astra 19.2° east analogue transmissions.

Dramatic changes

There have been dramatic advances in digital transmission within the digital and on-line household in the last few years. The first analogue TV closures in the UK have started and complete closure of analogue TV is expected by 2012, making way for digital TV terrestrial transmission nationwide. And don't forget the less than popular DAB!

Practical Television and later variations of the title have until recently reflected technological advances within broadcasting and receiver. A change of editorial staff during 2005 led to the demise of the original content policy that in turn led to a fall in subscriptions and advertisements.

Television reborn

The inevitable happened and the January 2007 saw the final *Television* magazine. It's a brave publisher that attempts to engineer the rebirth of a fallen icon but brave or bravado, the *Television* exists once again.

Several of the veteran writers have come together to support the new magazine and look to support from reader both past and new.

Practical Television first ran a TV DXing column in 1963, written by Charles Rafarel. Following his death in 1971, editor John Reddihough asked me to take over the column

It ran as a long-distance reception column for many years but gradually changed format to include satellite reception, broadcast news and related developments. After 36 years at the

helm the *Television* magazine rather than myself ceased to be!

My column will contain reception notes on satellite transmissions coupled with broadcast news as before. Terrestrial TV is changing with many countries now closing down VHF analogue TV and with it the opportunities for exciting Sporadic E summertime reception.

Digital TV is generally favouring UHF, which severely limits DXing opportunities to a few days a year. I feel that it's sensible to apply a reception hobby to an activity that can be carried out at nominal cost with a dish antenna in the garden or on a balcony. So there will be no terrestrial TV-DX in my new column, in line with current trends as experienced by the enthusiast. My column will evolve over the next few issues; this first article has been prepared at short notice.

In the 1970s, when the TV-DX column first appeared, we ran a series on 'How to TV-DX'. This series then formed the basis of a series of books from me. Unfortunately it wasn't made into a movie; I didn't make a fortune and retire at 40.

Why do people satellite DX?

You're all very fortunate since all the equipment for receiving satellite TV transmissions can be purchased relatively cheaply. I have generally specialised in the more unusual satellite signals. It's not the 'UK Living' or 'Playboy' broadcast signals that I cover but the more unusual and challenging news and sports feeds, or perhaps a broadcast signal that is different from the norm.

It would be simplicity to just fix a metre-diameter dish onto the 13°

east 'Hot Bird' orbital slot and just report on all the signal changes, new channels that appear: there are thousands of transmissions! But the challenge comes from the lower-level down-link signals intended for broadcasters and news groups. These often come from remote satellite terminals. They sometimes transmit just a news item and then close down.

Latest observations

I type this opening article on 22 October. A few minutes ago a live news feed appeared showing the massive fires across parts of California as viewed from a news chopper. A few days ago the Karachi bombing was reported. As former president Benazir Bhutto returned, unedited pictures appeared, relayed from three different local news stations on three down-links into Europe. There was TV news coverage of her motorcade – mass panic, crowds, the body parts – content that is rarely seen on UK screens.

Then there was the Al Qaeda 'promotional' video showing their latest arms being fired in Iraq, German hostages held by the Taliban in Kabul, the armour penetrating parachute bomb, the live computer directed missiles onto terrorists or via infra-red images onto night-time gun runners in the Balkans conflict. There was even reporting of picking up the remains of a suicide bomber in Jerusalem.

Sunday night carried pony trap racing from Mallorca and swimming championships from Durban, South Africa; as I type late on 23 October, 'Site Intelligence Group' is relaying more inspired recordings just released from Bin Laden.

For satellites in equatorial orbit, the satellite arc or Clarke Belt rises from the horizon in the UK's south east. It peaks due south at around 30° elevation, depending where you are. It then falls away to the south west.



The more you can see of this arc, the better your chances of receiving a varied diet of the more unusual TV content. You need a dish that can track across this unseen arc the sky. I recommend a 1-metre dish incorporating an 'H-to-H' (horizon-to-horizon) motorised mount. It should be either wall mounted with optimum southern viewing or a ground stand.

Wet washing woes

Remember that satellite signals are blocked by houses, trees in leaf and even next door's washing when it's wet. The dish collects weak incoming signals between 10.700-12.750GHz and focuses them onto the LNB, or low-noise block, down-converter.

This LNB converts incoming signals down to a more manageable IF signal in the 1GHz region for carriage along a low-loss coaxial cable such as CT100 or CT125 to your receiver.

Incoming signals are either vertically or horizontally polarised. A universal LNB will provide for both amplification, down conversion and band switching. It may also provide polarity switching controlled by the receiver using DiSEqC switching along the coaxial feeder. DiSEqC stands for Digital Satellite Equipment Control. Select a universal LNB with a very-low noise figure. I'd suggest a quality unit with 0.2 to 0.2dB.

Many satellite tuners provide power and control for the motorised dish tracking control. Alternatively, motorised tracking may be controlled from a stand-apart external unit.

For hobbyists I suggest minimising expenditure until your experience is widened. I would further suggest that the receiver to go for is a 'Blind Search' unit. Blind searching is a method by which you the enthusiast can decide what frequency bandwidth you want to tune across.

I used early Coship CDVB3188c models successfully and then migrated to the Manhattan ST-100



series that I prefer. The recently introduced Manhattan Plaza XT-F provides faster blind scan, though the power supply generates a degree of interference across medium wave. The Manhattan XT-F receiver sells for around £50.

Including the dish, motorised H-to-H mount, LNB and cable, I guess that you would pay around £220 for new equipment.

Most receivers will provide both scart and RF output for receiver connection, IF loop through for connection to another receiver and phono, or RCA, outputs for other equipment.

There is an increasing move for broadcasters to use MPEG 4:2:2 for their outside broadcast links rather than the established MPEG-2 of most receivers. Unfortunately the 4:2:2 format can only be resolved easily using a computer with a dedicated card. There's only one receiver currently available that can display 4:2:2 – and it's expensive.

I plan to elaborate on this topic in later articles.

Transmission guides

Satellite activity is extensive. I recommend that you check

www.lyngsat.com site for satellites operating over the 'Atlantic' and for 'Europe, Africa and Middle East'. Data sheets provide detailed information for each satellite and what they transmit. Look not only for programme channels but for 'feeds'.

The monthly *What Satellite and Digital TV* magazine is full of advertisements for receivers, dishes, LNBs etc and equipment reviews. I have bought equipment from several dealers over the years but one that's 'DXing aware' is

www.satellitesuperstore.com

This company will upgrade receivers with the last software changes, where applicable.

The dish will need to be installed and carefully aligned to track the satellite arc. This is a job for the specialist. Even though I have successfully aligned a tracking 1.5m dish, I'd not attempt it again. The larger the dish, the much narrower the signal pickup beamwidth. Personally I'd prefer to pay someone with a spectrum analyser and the experience. It's much quicker and you'll know it works!

As for reading material, the classic John Breeds 'Satellite Book' doesn't



appear to be in current publication. It may be available from your library though. It is essential reading for enthusiasts on how the satellite system works. Also, check out books from a satellite specialist.

Orbital sightings

The flavour of anticipated content in this section is sampled over the next few lines. Remember, this type of reception *is* possible on a metre dish.

The return of the former premier Miss Behazir Bhutto to Pakistan was met with two large explosions on the night streets of Karachi – 18 October UK time. Miss Bhutto's armoured bus, though damaged, saved her life.

Less fortunate however were about 130 locals that flocked to welcome her back home. The APTN 'UP4' feeder over Eutelsat-1 @ 10° East cut into the programme output of local Karachi TV channels to bring back breaking news pictures at 10.973GHz-V (SR 4167+FEC 5/6).

A second news feeder 'SATLINK 9722-S' went on-air at 10.963GHz-V (4167+5/6) together with 'KARACHI PATH 1' on the higher slot of 12.738GHz-V (4167+5/6). Both explosions and the following panic were caught on camera but the live

images aftermath clearing up human remains were not screened in the UK.

A few days earlier two German hostages, captives of the Taliban in Kabul, were displayed to the media on a rather grainy, hand-held camera. An armed guard is clearly visible at the side. This pictures also appeared over UP4.

W1 also provided a corporate transmission over the same period, being the Welsh awards for 'Sustainable work in the Public

Sector'. Those councils with 'switched-on' rubbish collections or energy saving measures were present shovelling up the silver cups. Two outside broadcast feeds provided pictures, 'ARQIVA SNG 45' – 12.706GHz-V together with the 'UKI-589' sat truck – 12.698GHz-V (both used 5632+³/₄).

Diana's inquest

Princess Diana's inquest led to the jury having a trip to Paris and viewing the tunnel and immediate environment where she died. There's been much international interest sufficient for the European broadcaster RTL to present a live news update from the tunnel mouth –Eutelsat W2, 16° East linked the live news insert into their German network 'n-tv' from the pavement over the RTL truck 'RTL MIDI D320A' – 12.550GHz-H (5632+³/₄).

Problems in the San Diego region during October have been aired. In the first week, a hill slide threatened many houses as part of the hill opened up and slide downward. Live pictures from the on-site news meeting confirmed that the authorities were very active both before and during the slide.



Late in October, massive fires engulfed many houses across a wide area of California. The high winds fanned the fires while limiting the aircraft water-bombing the destruction. State governor Arnold Schwarzenegger and emergency teams were on site each day to support the local population and promise national and federal help.

All these live feeds were carried over W1 including news chopper footage from high in the sky.

Digital switchover update

Digital advances continue as analogue TV falls by the wayside. Poland's Ministry of Transport notes that moves into DTT should start from June 2008 aiming for analogue close-down summer 2009, there being a 12 month period of simulcasting both analogue and digital through to mid 2009.

Across the channel and the French CSA have selected another 65 sites for DTT transmission to be airing by spring 2008 allowing all regional capital towns to have access to DTT.

Norway meanwhile continues to open more regions to DTT, having started the digital move in September 2007 in Rogaland. Region by region, it will go totally digital by mid 2008. Analogue close-down is planned for during 2009. Nearby Finland closed down all analogue TV transmissions on last September and is now totally digital.

Late October and neighbouring Sweden has now achieved total digital coverage – actually at 1600 hours locally on 22/10/07 when the Skane region switched on its DTT system. Analogue was due to close 1 February, 2008 but the date was advanced. It would appear that Swedish analogue TV is but broadcasting history.

Africa isn't isolated from the march of digital technology with the Kenyan Broadcasting Corporation announcing that by 17 June 2015, all



transmitters will be digital and all analogue services closed. The Information and Broadcasting Ministry has announced this as a mandatory instruction.

Nostalgia

Finally, our old friend Hugh Cocks in the Algarve has been restoring several vintage TV receivers such as the Bush TV22 and Bush TV62 bakelites. These are in near mint condition and can display 405 line System A images from his signal generator complete

with test card C and even an original RTF test card used with their early 819 line French System E transmission.

Happier days of valves, VHF TV and innocence. Where have all the years gone?

Test case 530 solution

This is the solution to Test Case 530 detailed on page 15

It's very common to have a dormant TV power supply and 300-odd volts sitting at the chopper transformer. It's very unusual to find this voltage present at all three lead-outs of the primary switching transistor and several burnt and wrecked components littered about the circuit.

And it's utterly demoralising to replace them all, only to experience an instant blow-up on restoring power. That's what had happened to Real Technician. The upshot was that our crestfallen man started investigations on the secondary side

of the chopper transformer. The line output section contained no short-circuits or leakage, and the LT supplies and circuits likewise.

When RT came to check D₆₃₇ however, which supplies 27V to the audio power-amplifier section, he found it short-circuited. No reason for its failure could be discerned, so an order was put in for a replacement, along with – at Television Ted's suggestion – a new optocoupler D₆₁₀, and of course yet another chopper transistor Q₆₁₃.

When they all arrived and had been meticulously fitted, the time



TV model: Sanyo CE32FWH4-B

came to switch the set on again. To witness the event there was quite a crowd round RT's bench: Sage, Television Ted, Cathode Ray and Service Manager!

RT closed the switch, and this time all was well: the set came on and stayed on. Phew! Why did this secondary-side fault cause so much trouble?

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A day in the life

by Peter Dolman

As a born optimist, I usually see the positive side of a situation – something Dear Heart lists as one of my many faults.

True to character, on turning the key in the lock this morning, I adopted my season of goodwill approach. I'd hardly got the lights on when the first customer appeared carrying a JVC DVD recorder complete with in-built hard drive. Sellotaped to it was a large envelope marked 'problems'. "Good morning Mr Lowe, how are you?" I ventured in what I considered to be a polite and sympathetic manner.

He drew himself up. "How am I? Ah yes, well we always reply 'fine, thank you' to that one don't we, but actually, since you ask, I've had quite a bit of trouble" he replied grimly. His voice dropped to a whisper as he peered around. "Medical" he hissed. "And another thing" he continued, warming to his task. "Guttering..."

At that moment Dear Heart swept in, saving me from further revelations. "Good morning Mr Lowe, lovely day,

how are things?" she enquired. "Ooh fine, fine, never better" he replied, shooting me a despairing glance as he retreated towards the door which she was holding open so encouragingly.

Then she pressed his machine into my grip. "Time and motion" she remarked tartly.

Not dead but surely poorly

The JVC was a DR-MH20. Although its troubled owner's synopsis had pronounced it dead, the machine powered up normally, the front display flashing 'loading' brightly for around half a minute, then darkening as it entered standby. However, ten minutes later when I was playing back a test recording from the DVD drive, the front display went out and all functions stopped.

Looking at the power supply I noticed that the area of the PCB around IC5101, the STR-G6653 regulator IC, was discoloured and that several electrolytics on the secondary side appeared stressed. After discharging the main electrolytic, I replaced IC5101 together with

capacitors 5103 and 5104 (27 μ F 35V and 470pF 1kV) in the primary circuit. I also checked and replaced any electrolytic with a high ESR in the secondary circuit. This restored dependable operation. Tests showed that C5103 had a high ESR reading and I concluded that it was probably the root cause of the problem, as its failure would impair circuit regulation.

Due to being situated close to IC5101's heat-sink, a 105 degree type is required and I made a mental note to replace this component in any similar machine, regardless of the actual fault it came in for. I should mention here that if the input fuse has blown then photocoupler PC5101, together with R5107,8 and 9, should be replaced in addition to those components already mentioned.

The symptoms displayed can include a dead or intermittently dead machine, 'loading' flashing constantly on the front display or unreliable record or replay – any of these problems can be caused by the above components failing by varying degrees. You'll find a similar type of

power supply fitted to a whole range of JVC DVD recorders including, for example, the DR-MV1, which incorporates a VCR but has no hard drive.

Flat screen, flat picture

In recognition of my success with the JVC, I received permission from Dear Heart to replenish the workshop's custard cream stock; thus I found myself at our local supermarket, where my eyes alighted on a less than impressive display of LCD TVs.

Taking my place in the queue, I allowed my mind to wander back to the days when television manufacturers considered their ultimate goal to be the rendition of a perfect picture.

We all had our favourite makes and models; one of mine was the solid-state Decca 60 series, manufactured around 1975. It was designed around Mullard's first 110 degree CRT and boasted fibre glass PCBs.

Performance-wise, it achieved an almost text book IF response, which was displayed with stunning detail due to the compact delta arrangement of the phosphor triads on the face of the tube.

Now, thirty years on, I gazed at the flat displays before me. Flat in more ways than one I reckoned. Any CRT set displaying such a woeful performance would need to have its tube replaced and the IF fault sorted out. The pictures were devoid of real detail.

Back to the workshop...

On my return to the sanctuary of the workshop, I mentioned my brief encounter with the modern world to Dear Heart. "Stop ranting" she responded brightly as she deftly coaxed a ribbon cable into position. "Ours is not to reason why. Those people are our customers too. And very soon they'll be ringing us up to ask you to please-please-please call out and connect whatever it is up to

all those other unwise purchases which they made last weekend. Either that or to tutor them on the operation of some unwanted gift of a DVD player that the children bought them – because they couldn't be bothered to think of something nice that their parents really wanted".

She was right of course, I reflected. It was all grist to the mill. Soon, tea appeared and the optimist in me began to return. Then her persuasive voice impinged once more on my shell-like ear. "Umm, why don't you devote your vast abilities to sorting out the Minsters' Tosh TV" she suggested. "They're bound to call in today... oh yes, and his wife always asks for you" she added gleefully. I sighed and heaved the set onto the bench. Vernon Minster was a quiet and gentle soul who I had a lot of time for but his wife Lettice was as mad as a dog in a bungalow.

Their set was a sprightly Toshiba 2805DBT which appeared lifeless, but I soon realised that it was only playing dead. Although there was no sound or vision, a blank raster appeared on advancing the A1 control. There were no on – screen graphics and I soon found that the remote control wouldn't return the set to standby.

On checking the remote for IR output I got a nice bleep from the tester. A couple more custard creams brought me the inspiration I required. The set's microprocessor, QA01 was probably slumbering. Checks on its supply and reset lines proved normal but the SDA and SCL lines (pins 53 and 55) were at 1.5V with no activity present on them. So I set to disconnecting the devices on the bus lines one by one until, lastly, I arrived at the pins of the AV switching IC, QV01.

Lo and behold, when its SCL and SDA pins were isolated, normal I2C activity was restored. It turned out that QV01 was loading the bus because the 9V supply to pin 1 of this device was missing. I finally located the 9V

regulator, QV22 which, due to its size and position, had been trapped in a vice-like grip between the pcb and the black plastic scart surround which obscures most the component side of the rear AV board.

Repositioning and resoldering this transistor restored full working order. I had just lifted the set over to the soak bench when the phone rang.

Poor picture

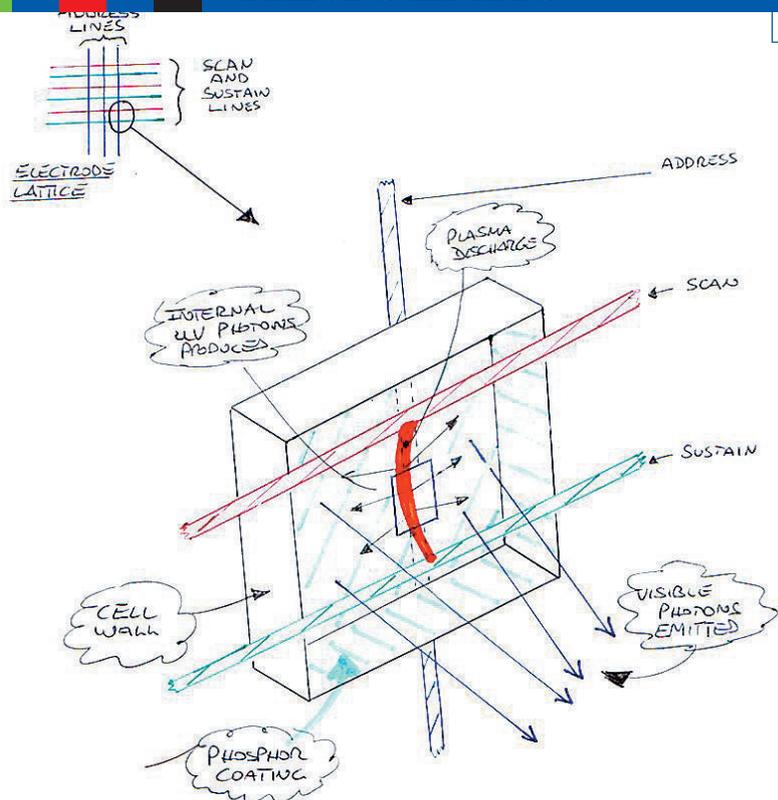
It was Harriet, and by the sound of it she had a big problem.

A customer for many years, Harriet's sight has begun to deteriorate of late. Although getting out and about poses little problem for her, the 21in Sony that I sold her years ago no longer provides ideal viewing.

Thus I found myself in the corner of her drawing room, gazing at a 42in Techwood TWP4210 plasma TV. "Is it me?" she was saying. "Is the picture quite as it should be?" It certainly wasn't. On the otherwise vibrant display, a vertical bar blanked around a 1in column of the picture from top to bottom. Some thirty minutes later, as I struggled manfully through the workshop with the monster, Dear Heart began asking awkward questions again. "Er, so how, actually, do those big displays work?" she enquired innocently. "Just the basics, I mean, nothing too high-faluting".

I always liked these little chats because it gave me a chance to test my own understanding of a topic-or the lack of it! Despite her claims that she was relatively non-technical, I'd always found her questions to be intelligent and searching - just the sort that a responsive student might ask. In this instance, it also gave me a chance to get my breath back, so buoyed up by the promise of another cuppa I warmed to my task....

"OK then, let's begin by working back from the end result" I suggested. "The light output you see on the screen of a plasma display panel



Sketch of single plasma cell

(PDP) is produced by outputs from thousands of individual red, green and blue phosphors, arranged in pixel groups of three, just like...

"Like on the face of a CRT" interrupted my companion. "But how come it's so slim?" I reached out for a notepad and roughed out a sketch. "Well, that's because of the makeup of the cell structure containing each phosphor" I replied. Every cell is positioned at the intersection of an electrode lattice covering the entire area of the screen, meaning that it can be individually driven via connections situated at the edges of the display. You'll see those when I slip the covers off that Techwood. "I read somewhere that there are over two million pixels on a high spec HD screen" she interrupted. "So how, pray, do you manage to control all that lot?" "When you put it like that it does sound like a tall order" I agreed, "but try to forget the actual numbers involved and just visualize a few of those cells. If you could look inside a typical standard definition PDP like the one I've just lugged in, viewing

from the front, you'd see that each vertical conductor of the lattice passes down the rear of a column of cells, against the glass backplate – in this way it forms an 'address' electrode at the back of every cell in that column. Crossing the front of each cell are transparent 'scan' and 'sustain' electrodes, these are formed by twinned horizontal rows of the conducting lattice.

Activating the electrodes

To display a complete frame, voltages are applied between these electrodes to control the activation of individual cells according to a three step routine. Initially all the cells are simultaneously 'set' to clear any vestige of charges from the previous cycle of operation. Then each cell is accessed, one by one, line after line, and written to according to the content of the incoming digitized video signal until every cell in the PDP has been addressed. Finally, in the third step of the routine, all the cells are simultaneously discharged and 'voila'. The display produces one full frame of

picture, all in glorious colour". Dear Heart's fingers drummed thoughtfully. "I see, so although the picture information is scanned sequentially in to the PDP, so to speak, it's not scanned out, it's released one full screenload at a time. Sounds good to me".

Am I nearly there?

Momentarily satisfied with my thumbnail sketch, she spotted me reaching for my mug and decided on one last line of attack. "So how come those little cells have to work with gas? Didn't you tell me that tubes have a vacuum inside?" Resting her hand cozily on mine, and thereby denying me the inviting prospect of contact with my cuppa I had little choice but to continue. "Briefly, to release energy – in this case visible light photons – from an atom of phosphor, it's necessary to bombard it with some suitable sub-atomic particle.

One familiar method, used in the CRT, is by means of a targeted stream of electrons moving through a vacuum. However, in the case of the PDP, the stream of particles striking the phosphors consists of ultra violet photons, which are generated when the cells are discharged in the way we've just mentioned. The cells utilize Xenon and Neon because this particular combination of gases readily breaks down, or ionizes, into plasma when subjected to an electric field.

One result of this ionization, otherwise known as a plasma discharge, is the production of energy in the form of ultra violet photons. The construction of each cell is such that when this discharge occurs, the ultra violet photons emitted strike the surrounding phosphor layer, which in turn generates visible light". The grip on my hand seemed to relax a tad. Sensing the moment was opportune, I reached swiftly for my tea and made off to investigate Harriet's Techwood problem.

On removing the rear cover, I checked the symptom once again, noting that the vertical strip in question was situated just a little to the right of centre. Even without the benefit of a circuit diagram, the positions of the seven multi-pin output connectors spaced along the lower edge of the drive pcb gave an indication as to which of them would carry signals associated with the problem.

Is it the plasma panel?

However, my 'scope checks showed that address data was present here, suggesting that the problem must lie with the plasma display panel (PDP) itself, or just possibly with the relevant flexi cable. I withdrew the end from its connector to inspect the contacts, then realised that what I'd assumed to be a large metal fixing clamp was in fact the rear of a heat sink situated part way along the cable itself. On releasing it, I was able to gently twist the flexi cable over to reveal an encapsulated power device, plus four large surface mounted resistors. Hoping against hope, I began to reflow the joints and to my delight, one of the resistors dropped off when the tip of the iron was applied to it! Resoldering produced a complete cure. As a precaution, I reflowed similar joints on the remaining six flexis, many of which also appeared the worse for wear. Things were definitely looking up.

At that moment the door flew open and in swept the Minsters to collect their set. Vernon smiled at me quietly from the safety of a corner as his wife closed in. Her hair, piled high like a demented beehive, wobbled menacingly as she spoke. "That's a very low doorway you have over there... you surely must receive myriad complaints about it, hmm?" Satisfied, she broke off, seemingly lost for a moment, then her gaze came to rest on her Toshiba TV. "As you can see..." I began. "Oh, oh I do see..."

yes, very clever aren't you, you've given it new life!" she murmured darkly, pursing her lips like a coit. From the corner of my eye I spotted Dear Heart tiptoeing softly away with Vernon's cheque, and he, sensing danger, was covertly retrieving the Toshiba while his wife was distracted. "And what is life?" she remarked to the ceiling. Then crooking a finger she beckoned to me as if to share a confidence. Imagining I'd won her over, I grinned stupidly and leaned forward, allowing myself to relax. She cupped a hand to my ear. "My father was a scientist!" she blared, wild-eyed. As I reeled back she tossed her head and, cackling maniacally, flounced out, her quivering hairdo narrowly missing the doorway.

Sometime later, head still ringing, I detected Dear Heart's dulcet tones impinging on my remaining good ear. "Just look at that picture" she was saying, waving her hand toward the plasma TV which was now running on the soak bench. As we watched, a snooker ball travelled blurrily across the green baize. On a nearby CRT set the same motion was rendered cleanly. After a pause, she summed up her thoughts. "Seems to me that with the PDP, you're producing plasma which then produces ultraviolet photons, which finally produces visible photons" she observed. "That's three steps. Whereas with the CRT, you're producing electrons which in turn generates visible photons...that's just two steps. I reckon that's why I rate CRT performance. Why can't they design a flat panel which produces electrons directly from its cells?" "You're wasted here" I replied. "Toshiba and Canon already have. It's called the SED display and you'll find one on my Christmas wish list".

That evening, much to her delight, I reinstalled Harriet's Techwood TV. She was really pleased with our service and to make her point, she quoted me the lines of a most appropriate piece of poetry by Ralph Waldo Emerson. While admitting to her that I'd never

heard the verse, I have to say, I was knocked sideways by her gratitude for what was, effectively, nothing more than us doing our job well.

...and now the reward

The following day with the wind howling and the rain falling in sheets, the workshop door swung open and a figure swathed from head to toe in heavy waterproofs entered. I glanced up nervously; certain events over the past 24 hours, had left the optimist in me a little bruised...

However, I needn't have worried. Harriet unbuttoned her hood and smiled, producing a damp parcel. "It's for you both" she said breathlessly, placing it on the desk. "Just to say thank you". Then, re-buttoning her coat, she was gone, striding steadily away into the storminess of the afternoon. "Come on, open it" begged Dear Heart, "it's almost Christmas after all!" Inside the package was a framed hand written poem; the one Harriet had quoted so generously to me the day before. It read:

"If a man write a better book,
Preach a better sermon,
Or make a better mousetrap than
his neighbour,
Though he build his house in the
woods,
The world will make a beaten path
to his door"

"Oh gosh, what a lovely compliment, that's going to have pride of place in here" gushed Dear Heart. "Next to my bench", she added quickly, snatching it out of my hands. I didn't argue. Instead, I turned and looked about me - there were still numerous repairs to be sorted before Christmas, but I reckoned that although making a successful business in this trade can be tough, we were living proof that with a great deal of effort and patience, together with a naively positive attitude, it could be done. Dear Heart, sensing my inactivity plied me with liquid refreshment. "Time and motion" she grinned.



Restoring a 1946 Little Maestro

by Tony Thompson

The Little Maestro series by Pilot Radio started just prior to WWII. It was offered housed in a small wooden cabinet similar to the set that is the subject of this article, but the chassis within was different, being the more typical AC/DC type using a line cord as a mains dropper. Its 'Octal' valves had their heaters wired in a series chain.

There was the alternative of a cream or mottled brown Bakelite cabinet, the distinctive and practically ubiquitous louvred one we all associate with the brand – and used with minor changes for many kit receivers in the post-war period.

Wooden cabinets can be found with variations of applied veneer.

Some have gently rounded cabinet ends. There are many minor variations of cabinet and chassis. Octal valves of the American type are used in the early Little Maestro ranges, pre- and post-war; this AC only set used standard 6.3V heater types. The AC/DC versions used the ones with higher heater voltages.

As good as the vintage Trader service sheets are, there are variations that don't merit a mention, along with, occasionally, other omissions. The nearest sheet I found for this receiver is 809. With this particular set, the 1k HT smoothing resistor R₁₂ was nowhere to be seen above chassis.

Below, there was a rather crude but obviously factory-completed

soldered joint. It was hanging in air where the leads from the smoothing and reservoir capacitors – which were unusually perfect, by the way – connected up with a lead from the rectifier cathode and one side of the loudspeaker field coil; in other words, the field winding was doubling up as both a choke and an energiser for the loudspeaker magnetic field.

The resistor had been dispensed with. This change isn't covered in the relevant Trader data. It is likely that this chassis was an early 1945 product, or just, possibly, a version from the beginning of the war. It used the energised loudspeaker that was fitted to the pre-war AC/DC Mk I version, but the wooden cabinet is

unlike the one pictured on Trader sheet 444. This sheet covers the pre-war (1939) first production run.

Nor is there a diagram showing the tuning cord arrangements. These are simple, but it is important to loop the cord three times around the waisted section of the control knob spindle in order to get a slip-free pointer rotation. Thin cord is essential, as is good tension on the spring, which bends around the circumference of the drum for part of its travel.

You would be forgiven for thinking that the set uses a single IF transformer as there is only one can on the chassis top, but the second IF is squirreled away below deck, windings unscreened, its trimmer capacitors accessible via two holes in the chassis. Both transformers are air cored and use capacitive compression trimmers for aligning.

General condition

The wooden cabinet was quite badly marked and very dirty. Luckily it had escaped severe damage other than surface scratches and scuffs to the finish. It was clear that refinishing would be a straightforward process.

The main veneer on the sides, top and as a strip across the upper and lower front of the ply cabinet was

walnut, with a contrasting wide band of a lighter timber, probably yew.

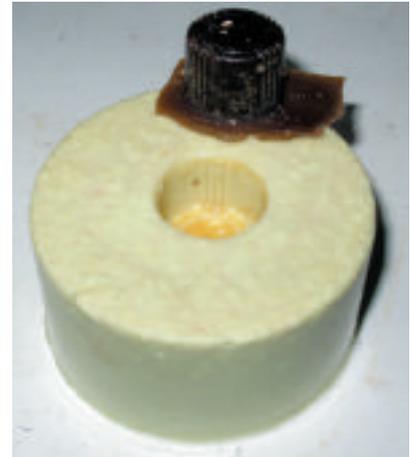
The mains lead was missing, as was one of the small control knobs. The back panel was present but the chassis retaining screws were absent and the chassis was held only by the two remaining push-on knobs. No grille cloth is needed because of the louvred loudspeaker grille panel.

Making a replacement knob

Finding a suitable replacement for knobs is a continuing problem. An alternative is to make your own, assuming that you have to hand at least one good example to copy.

There are several methods that can be used. One is to obtain a quantity of alginate moulding compound. This can be found in art or model shops and from craft suppliers on the internet. You will need to find a suitable scrap knob which is sacrificed to release the brass or steel 1/4in-bore inner sleeve.

Thoroughly clean and polish the knob to be copied with wax or silicone polish, which will act as a release agent. Next, mount it upright in a small container and secure it with double-sided sticky tape. Plastic tops from large-sized aerosol spray cans are useful here.



Knob casting

Following the instructions on the packet, mix the alginate, making sufficient to completely immerse the knob plus at least 20mm additional depth. This is to ensure adequate support for the casting, as newly moulded alginate tends to be flexible.

After a few minutes, the alginate will have set and can be removed from the container. When using the straight-sided can tops mentioned above, it is probably easiest to slit the plastic sides to free the set alginate.

Remove the knob carefully and place the mould on a level surface. Mix casting resin with sufficient hardener, adding if you wish a small amount of paint as a colouring agent. Don't overdo this as a little goes a long way and can weaken the casting.

I find mixing brown, black and red gloss paint gives the closest colour match to Bakelite knobs. Of course, the knob can be painted later. Often this is the easiest way as adding paint to resin is an inexact science at best.

Pour the activated resin into the mould steadily, slightly overfilling to create a meniscus to allow for slight shrinkage. Then tap the sides of the container to free trapped air from the pouring. Once set, the casting can be removed from the mould.

I find a pillar drill best when boring the back of the knob to take the brass insert. Drill a series of



Cabinet interior view



Reproduction knob (right) completed

gradually increasing holes, starting with, say, a 2mm pilot drill and working up to a critically-sized drill to take the brass insert.

The insert can be pressed into place using a bench vice. Finish by drilling in from the side and tapping; 6BA (small knobs) or 4BA (larger sizes). Drill a larger clearance hole through the resin – don't tap this, only the smaller hole through the brass sleeve.

One important tip: do not leave the Alginate moulding more than a day or so before casting, as it will slowly but surely dry up, shrink and distort. I often cast the resin within a few minutes of the Alginate setting.

Cabinet renovation

The loudspeaker louvres are formed from a single panel of solid wood – therefore rather fragile – which is screwed into the aperture in the cabinet. It is easiest to separate this sub-panel before starting any cabinet work. The dial glass must be removed, also and this is secured by

two small clips held by even smaller wood screws. Take care not to lose these screws as they are difficult to replace.

The cabinet shell can then be stripped of its original finish using

paint stripper, applied with a paint brush. I used a smooth-edged paint scraper to lift the softened finish, which came away very easily. Wire-wool dipped in paint stripper smoothes the surfaces and removes any stubborn remnants of finish.

Traces of the paint stripper can be removed by rubbing down the cabinet with white spirit. It is then allowed to dry before being thoroughly coated on all surfaces, inside and out, with woodworm treatment.

Once fully dry, any dents can be filled with tinted wood filler followed by a light rub overall with very fine abrasive paper. The cabinet can then be sealed with French polish (shellac) applied with a brush then wiped partly off across the grain with a cloth damped in methylated spirits. This helps to fill the grain so fewer coats of lacquer will be needed for a good finish.

In my case, the contrasting, lighter yew veneered front panel was masked

with masking tape before the cabinet received several light aerosol-sprayed coats of walnut-toned lacquer. When this was thoroughly dry, the masking was removed and a couple of coats of clear lacquer finished the spraying.

A day or so later, all sprayed surfaces were treated with 'T-Cut' and buffed with a soft duster. This left the cabinet with a softly glossy shine, which is better than the over-bright glitter that spraying tends to cause. The loudspeaker grille was treated separately by the same processes before being remounted.

To finish the cabinet, the foot strips were painted gloss black.

Chassis restoration

In order to clean the chassis – and, at the same time, replace several lengths of suspect wiring – the loudspeaker, the upper IF transformer can and the tuning capacitor, scale and lamp holder were removed. The loudspeaker is held by three 4BA bolts. Two of these fit through the rim, screwing into the front rail. The remaining one fixes the field housing to a bracket. This screw is noticeably shorter than the two front screws. Take care to fit the correct length upon reassembly.

Wires to the output transformer were unsoldered before attempting removal of the loudspeaker. It is wise to make a note or diagram of the wiring colour. Good close-up photographs are helpful, too.

These comments also apply to the



Cabinet masked, first toning coats



Cabinet shell completed



Finished cabinet



The chassis before work began



The chassis partly stripped

tuning-capacitor connections. Some of the wiring to this component is short and it was necessary to unsolder or cut before any movement of the component could be achieved. Note that the chassis earth to the frame of the capacitor is beneath in a rather inaccessible spot.

Two 4BA nuts with star washers hold the IF can, from below the chassis. The central top nut only holds the coil assembly. Unsolder the transformer connections – these are wire ends, not tags. Alternatively, as I prefer, unsolder the valve cap from the lead – which is often perished in any case – and remove the top bolt. This allows the core to remain in place as the can is lifted clear.

I cleaned the chassis metalwork using a small wire brush. A similar process cleaned the loudspeaker and its transformer. The wiring that checked OK was cleaned with a cloth sprayed with switch cleaner and the metal pressing of the transformer was painted with anti-rust grey.

The tuning capacitor needed a thorough clean, so the integral trimmers were dismantled and the mica washers, ceramic discs and screws cleaned and placed safely aside. The capacitor was then thoroughly washed with hot water and washing-up liquid and dried with a heat gun on a low setting.

After reassembly of the trimmers, a touch of grease was added to the

bearings and a spot of switch cleaner to the earthing blades. The frame was badly discoloured and so it too was painted with anti-rust grey before remounting. New leads were made up for the valve caps and the case of the IF transformer was cleaned with metal polish and fine wire wool before refitting. The rotting lead to the scale lamp was replaced. This completed most of the top chassis work, so attention was turned to the under-chassis.

I used a multimeter to check resistors in circuit, reading both ways and selecting the highest reading as the correct one. By this method, R_6 and R_7 were shown to be well out of their specified resistance, R_7 in particular having risen from 270k to 360k+, a rise of almost 100k. These were double-checked after disconnecting one end. All other resistors were close enough to their correct values to be left in circuit.

Wax-coated capacitors such as the ones fitted to a chassis of this age are not to be trusted – in my opinion at least. I changed most of them for the nearest modern value.

The three most important ones are the 0.01 μ F AF coupling capacitor C_{12} , because a leak here will shorten the life of the output valve; the 0.01 μ F tone corrector capacitor C_{13} , because a short here will overrun the output valve to destruction and

possibly damage the rectifier valve; and the 0.05 μ F mains RF bypass capacitor C_{14} . This last device ideally should be changed for an 'X' safety rated component of 1kV DC. Better to omit it entirely than risk a standard component in this position.

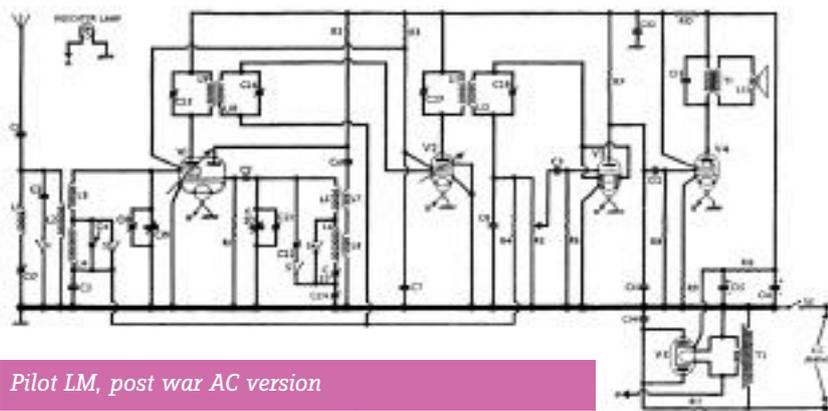
Alignment

Alignment was carried out using the Trader sheet instructions as a guide. This advises that the signal generator should be connected via 0.1 μ F capacitors in each lead.

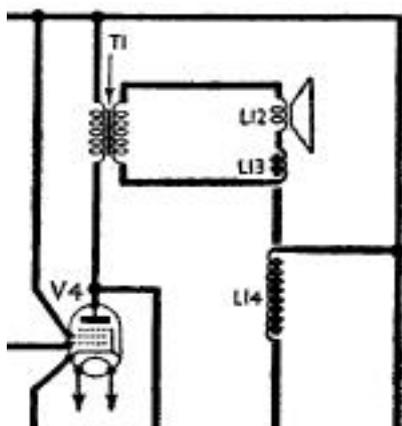
Briefly, the IF stages are aligned first – standard practice – feeding a 451kHz signal via $V1$'s top cap. Final IF is the first to be adjusted, i.e. C_{28} and C_{27} through the chassis holes, then C_{26} and C_{25} . Signal level should be kept low and backed off as alignment proceeds to prevent AGC action and to keep the tuning sharp.

After the IFs are set to optimum, RF stages can be aligned by connecting the generator to the aerial input via a small capacitor. *Trader* recommends 500pF. A strong 451kHz signal will allow C_{17} – the IF filter – to be set to minimum output. With the generator set to 1400kHz and the receiver set to 214m medium wave trimmers C_{21} and C_{18} can be adjusted for maximum output.

With the generator set to 600kHz and the receiver at 500 metres approximately, tune the signal in as you adjust C_{24} for maximum output.



Pilot LM, post war AC version



Pilot LM, pre-war energised loudspeaker version

Chassis completion - and a problem appears

Having successfully aligned the set and finished off generally – cleaning valve-holders, switch and volume control, that kind of thing – I rewired the mains input with new two-core cable, making the single-pole on-off switch break the live lead. Satisfied with my efforts, I decided to power the set up once more just to check that everything was as it should be.

It wasn't. There wasn't a sound from the loudspeaker. It was so quiet – not even a click when the wave-change switch was operated – that at first it seemed that HT must have failed. I could see that the valves were lit, as was the new scale lamp I'd just fitted. However, a screwdriver on the volume control slider proved that at least the AF stages were in fully functioning order.

I was about to start voltage checks around the IF and mixer/oscillator stages when something caught my eye. There was a little glint reflecting the illumination from the bench lamp. It was the end of one of the windings of the second IF transformer. Somehow it had been parted from its mounting tag. As I busied myself adding a short stub of wire to the tag, then scraping back the enamel on the remaining fine wire from the winding, I noticed that the other wire end of the same winding had also broken.

One broken winding could be seen as regrettable, but two – well, that's leaning dangerously toward downright clumsy. How I'd managed to break them both remains a mystery, but it's worth noting that because the winding is exposed beneath the chassis, it is vulnerable to damage – at least, by cack-handed me.

In summary

After my repairs, the set worked once again beautifully. With the receiver fully assembled, clean glass, new knob and chassis bolts (originals were missing), it looks a very attractive period piece. Good little sets, these Maestros, and recommended for restoration for those of you who don't mind working within the confines of a small and crowded chassis.

The octal valves are robust and easily obtainable in the event that replacements are needed. The cabinets, both the wooden version and the Bakelite ones are popular with collectors.

There are a couple of points to be aware of: having a live chassis, as all the Little Maestros do, whether using a heater transformer or line cord, there is always the danger of electric shock from the metalwork. For this reason, any knob fitted with a grub screw – like the one made here as a replacement – must have the screw countersunk and the screw head insulated. In this case, I filled the screw hole with melted brown wax. The same caution should be applied to the heads of the chassis retaining screws beneath the cabinet. I filled these with wax. A dab of thick paint would also be suitable. When replacing mains leads, two-core only should be used, never three core with an earth.

Only those appropriately qualified to undertake this type of work should consider doing so, because of the inherent danger in all vintage electrical items and especially radios using live-chassis technology

Switch to long wave, set the generator to 300kHz and the receiver scale to 1000 metres and adjust C_{22} for maximum output.

Finally, with the generator at 188kHz and the scale around 1596m, adjust C_{23} for maximum while rocking the tuning capacitor through the peak as you set to optimum.

I monitored the output using an oscilloscope across the primary winding of the output transformer, but a meter – easiest to observe changes if it is an analogue type – would be quite satisfactory here.

Obviously the generator note can be heard, assuming you set your generator to modulated RF, but it is best not to trust to your ears when aligning. Quite wide variations in audio level can pass unnoticed due to the human ear's response.



Pictures from the past

Recreate some of the earliest television pictures ever seen and watch them on a replica of one of the first TVs. Here, Paul Godfrey describes the first commercially available 'Televisor' since the 1930s. This kit uses 32-line scanning and includes original footage*

I first heard about this product from the pages of the Narrow-Bandwidth Television Association's newsletter, Volume 32, No 2. It appeared around Christmas 2006.

This newsletter contained a few lines relating to a member's visit to the National Museum of Photography, Film and Television, now called the National Media Museum, in Bradford, West Yorkshire. In the museum's shop he discovered a Televisor kit that they were selling for

£29.99. He bought one and built it.

The member suspected that the device used the NBTVA's 32-line standards in some of its circuit designs and informed the NBTVA of his observations. Several other NBTVA members also bought kits. One member, Peter Smith, looked at the circuitry, etc., and confirmed this.

I was intrigued. After a Google search, I discovered that Middlesex University Teaching Resources marketed and manufactured the kit for £31.78 excluding carriage. I placed an order on-line and eagerly awaited the delivery of my new toy.



Fig. 1

Contents of the Televisor kit

*Paul Godfrey - G8JBD

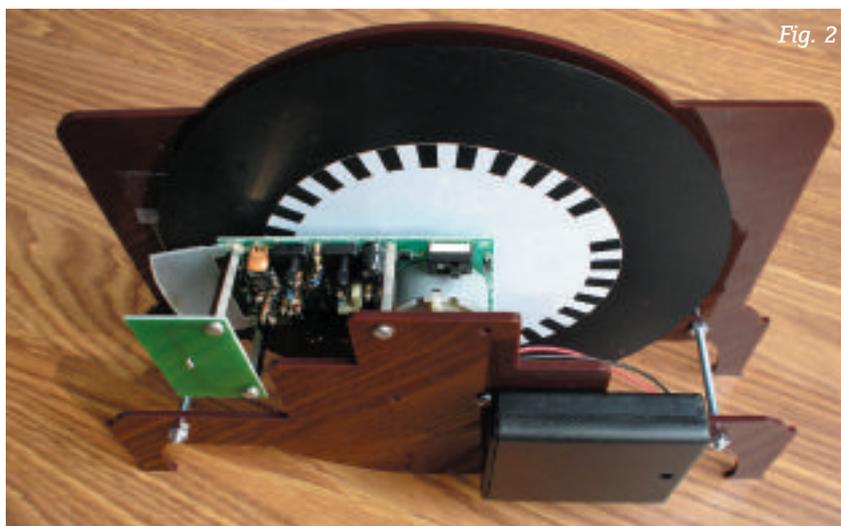


Fig. 2

Televisor internals, clearly showing the Nipkow disc and the circuit board

After a wait of about seven weeks, I made an e-mail enquiry regarding my order and a few days later a parcel arrived.

The unit came nicely packed and MUTR included a copy of the organisation's catalogue, **Fig. 1**. This catalogue contains a vast number of interesting kits and projects, along with many pages of mechanical and electronic components.

Putting it together...

The Televisor kit was in a nicely labelled box that contained all the parts, **Fig. 2**. These included front and back plates plus fixing screws, a pre-drilled Nipkow disc, connecting lead, battery box, magnifier lens, 2 PCBs, a CD with some NBTV images recorded, diffuser, label for the front panel and an instruction booklet.

With the exception of the LED, the circuitry is all on one double side PCB. This is fully assembled so no soldering is required.

I managed to put the kit together in about half an hour using screwdrivers and a small spanner, following the very clear instruction booklet.

The trickiest part is putting the Nipkow disc onto the motor shaft, **Fig. 2**. Care must be taken to ensure the optical sensor on the PCB is close enough to the printed area on the

rear of the disc to obtain a good sync. But it should not be so close that it touches the disc.

Both front and back acrylic panels are covered with a protective film that must be removed before assembly. The finished Televisor bears a resemblance to an original Baird Televisor because of the shape the front panel, **Fig. 3**. There is even a stick-on label that has a logo on it very similar to the Baird Company's 'Eye of The World' trademark – a very nice touch.

The completed Televisor looks smart, with its nicely-cut acrylic panels. It is aesthetically pleasing enough, with the permission of the XYL, to be displayed as a conversation piece in the home. Well I think so anyhow.

Using the Televisor

Once the kit was assembled, the four AA batteries that were not supplied were fitted. There is an on/off switch on the battery box

and another on the main PCB.

At switch on, after the disc speed had stabilised, a pre-installed test-card pattern appeared in the magnified window. This pattern is part of the circuit. It consists of a chequer-board pattern and the words 'TEST CARD'.

Adjustments to disc sync/speed and brightness can now be made by adjusting the two small pots on the PCB. Once you have a good steady picture you can proceed to the next stage of connecting a personal CD player using the 3.5mm jack. A 3.5mm jack lead is supplied.

The instructions recommend turning the battery power off and plugging the lead into one of the sockets on the PCB. Another socket is provided for headphone connection so that any audio content on the disc can be monitored.

In the instructions, it is recommended that a personal CD player with a line output is used as opposed to the headphone output. The age of the iPod has rather pushed aside these once popular 'must-have' gadgets. I have not seen any recently launched personal CD players that have a line out as well as the usual headphone output.

It occurred to me that the audio line output of a cheap DVD player could be used but this may be overkill.



Fig. 3

I find the finished Televisor attractive enough to have on show at home as a conversation piece

Modifications to the Televisor kit

In Volume 32, No 3 of the NBTVA Newsletter, Peter Smith suggests some modifications to the Televisor. These are:

1. Replace the diffuser with a piece of 0.01in (0.254mm) thick double-matt Mylar film. This is available from NBTVA club sales.
2. For a more authentic look, replace the single red LED with two orange ones in parallel with two 5.6Ω resistors in series with each LED.
3. Add a decoupling capacitor, a 0.1μf ceramic type, between pins 8 and 16 of the 4046 IC.
4. One of kits built by a club member had a disc that did not run true. A 22kΩ resistor had to be put across R₁₇ to increase the sensitivity of the sync comparator. This was not a problem with the kit I built.

Watching TV recordings

I found a suitable personal CD player and connected it up. I first tried the CD that came with the kit. There are several sequences on the disc all preceded by a count down.

Most of the sequences are still pictures of celebrities including John Logie Baird, Winston Churchill and Margaret Thatcher – to name but a few.

There's also a couple of bits of moving picture footage, including one of Dr Martin Luther King Jnr giving his famous "I have a dream" speech."

The results were good. Next I tried one of my Narrow Band TV Association discs of test signals on the CD player. I was rewarded with a good steady display of the NBTVA

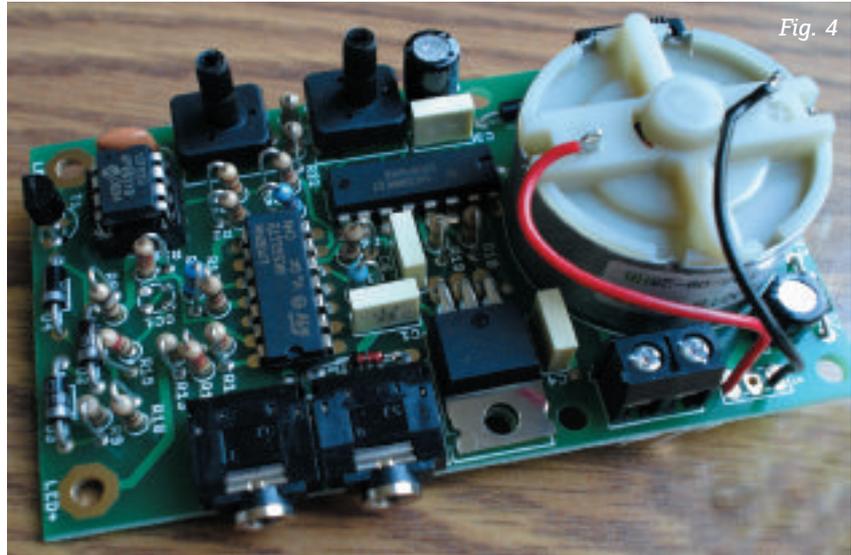


Fig. 4

Circuit board of the Televisor showing the jack sockets

test card and other sequences that are on these discs.

The results using these discs are better than those from the CD supplied with the kit. I would recommend anybody who wants good reliable 30 and 32 line signal sources to purchase at least one of these from NBTVA club sales.

Considering the small size of this Televisor, the use of a single red led and the low cost of the kit I think the results are very good.

In summary

This kit is the first commercially made Televisor since the 1930s. It uses the NBTVA's 32 line scanning and synchronisation standards and published motor control circuits.

It can be obtained from: Teaching Resources Ltd, Unit 10, The IO Centre, Lea Road, Waltham Cross, Herts, EN9 1AS.

I would recommend looking at the company's web site for details of cost and carriage charges. Delivery outside the UK looks expensive.

The Televisor works well and is an easy way to obtain a mechanical TV receiver. Its price is reasonable and the results are good. I would recommend it to anybody wants to experiment with something a bit unusual.

I also recommend membership of the NBTVA. The association's newsletter alone is worth the cost of membership, let alone the access to the club sales to obtain all sorts of useful parts. Of course there's also those Test Signal CDs, that are superb.

The organisation's convention held annually in April at the University of Loughborough.

Useful web addresses

www.mutr.co.uk

to purchase the Televisor kit or for details on how to purchase it.

www.nbtv.org

For membership information about NBTVA plus loads of stuff on NBTV in general.

www.nationalmediamuseum.org.uk

The web site of the National Media Museum, in Bradford

Another 20 years in Provence

by Chris Hawkins

After a not so brilliant career spent in university bars and the dark depths of industrial development laboratories yours truly 'moi meme' decided to set sail across 'La Manche' to the land of the 'Grenouille' (Frogs) on an adventure that has lasted more than 20 years.

I've always had a passion for France, which started when I bought my first Michelin yellow map. As a keen cyclist I would spend the winter months planning out an itinerary for the next university holidays. To get the money to finance the trip I worked in all places, a cemetery, Christmas, Easter and half of the summer holidays was spent grass cutting and digging. I used to tell my grandfather that I had a job with a lot of people under me. It was good money for those days, most of it was spent on the bike for my trips to France.

There's something about France that once you've visited it you have to go back. True, the French can be difficult to understand and at times frustrating to deal with, but they know something about the quality of life. One day by chance I bumped into a French girl. I fell in love with her and she later become my wife.

We got married in France in my wife's home town but returned to the UK to live. I was an engineer in flight simulation and my wife a teacher in a comprehensive school. Our main holidays were spent in Provence. As time went by I found it hard at the end of the holidays to leave the blue skies and dry climate and return to my 9-to-5 job in the UK. Eventually we decided to go and live there. How we managed to do the removals God knows but I remember driving a Ford Transit filled well over the legal limit with furniture, white goods and stacks of electronic test gear.

Unknowingly, we chose one of the worst moments to travel and were caught in one of the worst storms I've ever seen. After a nightmare journey down the auto route we arrived in Provence. My mother in law had found us an apartment over a garage situated on the town's main boulevard that was later to become our shop. After unloading all the tea chest full of technical books, service manuals and clothing there was a tremendous storm and within minutes the garage was flooded to a depth of 1 foot of water and most of our belongings were ruined. Within the hour the sky was clear and the sun was out as if nothing had happened, something I learn to expect over the years.

Setting up business in your own country is never easy but here it took months and an endless amount of paperwork to sign, visits to the Chambre de Metiers and the Chamber de Commerce. But at the end of it all we had the go ahead and up went the shop signs on the garage

doors. Surprisingly we had quite a few people come in the first few days mainly out of curiosity, as word had got around that a 'Roast Beef' (Englishman) was doing TV repairs in the town. Bit by bit repairs starting coming, in mainly as I was offering a three months parts and labour guarantee – something unheard of here. My wife would run the office and serve at the counter and I would do the repairs at the back of the shop. A lot of the early work was valve TVs running on 819 lines. Typically the customers would say 'Monsieur c'est juste un fils debranche ou un ampoule grille (just a loose wire or a valve that's gone).

“true, the French can be difficult to understand and at times damn frustrating to deal with but let's face it; they know something about the quality of life.”

Fortunately for most of the repairs I didn't need a circuit, but I still couldn't use my collection of Television and Radio Servicing books as the makes and models were completely different from the UK models. As time went by this was to change. I acquired an extensive collection of French service manuals. Fortunately now most European TVs have the same chassis.

In those days, shops closed between 'Midi' and 15:00 and didn't shut until 20:00 at night, which was very hard to get used to, as was the custom of being offered 'Un verre de Pastis (Glass of Pernod) or 'pinard' (local cheap wine) by customers.

Booze and good food were dirt cheap in those days and the idea of a breatholyser was unheard of. To boost our income, we would run discos in the village halls or at wedding receptions – something that

was a novelty in these parts.

As time went by I started doing repairs for supermarkets, shops, garages; you name it I had a go at it. Eventually I stopped doing in house repairs as there was so much work being brought in directly to the shop. It was nothing to see two or three TVs or car radios that were exactly the same model in the same day.

The brands I saw were all sorts of strange names like La Voix de Son Maitre (His Masters Voice) Radiola (Pye), Sonolor (ITT). When eventually the big video boom came I was well placed to do the work as I was getting most of my parts in from the UK or the far east at prices

unobtainable in France at that time. Things were going so good that I was selling parts to wholesalers as well as other repair shops in the area.

During the 80s and 90s, we produced a regular catalogue for components. It was a time when kids were into building electronics gadgets. Even local schools were buying bulk from us, as well as local industry, so it was nothing out of the ordinary to stock hundreds of BU208 and BD135 transistors, and the whole range of CMOS TTL and Audio Video IC.

One of our best lines was the STK ICs for videos and Hi-Fi systems. The catalogue ran to 10 pages and just in the local area we had over 250 professional and trade customers, further a field parts were being sent to the Reunion Island Gabon, Morocco etc, business was good...

The TV Man

by Arthur Jackson

“**T**he TV Man!” Oh how I wish I had a pound for every time I was called that by the many customers or more often their children who would generally rush to answer the doors of the thousands of customers homes I have called at over the last few decades, the most common roar in my part of the world after I would briefly introduce myself being “MAMMY; IT’S THE TV MAN.” As long as I wasn’t “the TV licence man” I was always made very welcome.

I believe at the start – for me the late seventies – and throughout the eighties, people were so glad to see us arrive to repair their set as it was generally the only one in the house and was sorely missed when out of action.

There were very few repair jobs not completed in the house, on site; jobs that nowadays would never be a consideration, many a tripler, transformer, tuner etc. Even a couple of black and white tubes were replaced in a customer’s living room – usually in front of a roaring fire and often with an audience of the entire household as they eagerly awaited their viewing pleasure to return. It’s hard to imagine a household nowadays with any more than two people in it watching the same channel at the same time.

As the repair operation was progressing and going well my confidence would be climbing rapidly and my body language was probably taking on the appearance of a superior being. But all too often this buzz was cruelly shattered when the back of my hand was melted against a large mains dropper resistor.

Or worse still, when I got too close

to the top cap of one of the high voltage valves in the line output stage and received an almost lethal shock. This usually resulted in me jumping in the air, the horrible smell of burnt skin and the screwdriver I had been holding doing a ‘nought to sixty’ at a rate that would amaze even Jeremy Clarkson.

Usually any young children would leave the room when this happened. Some left out of pure fear – which was obvious by the look on their faces – and others because of their dislike of my colourful language. A good whack of a few kilovolts would test even the clergy’s ability to suppress their language. At this point the living room fire would seem to get unbearably hot while my previously high confidence level shot rapidly back to zero.

In my early days a new colour set cost an average two or three month’s wages. Reliability wasn’t great so the rental business was booming. I was fortunate enough to join a family-run company as a time-served technician in nineteen-eighty. This firm, which I still work for, had at that time over four thousand rental customers in a roughly 30-mile radius.

The work load and overtime for my first ten years with them was incredible. I’ll never forget a comment passed in innocence by my daughter when she was about four years old. She said, “No matter what time of year you come home daddy, you always have your car lights on.” It was an unusual but accurate observation and I had never realised it until then.

In the early eighties, we were mainly working with a couple of rental brands. The existing engineers knew them well and shared their knowledge with me during many a



late night at the workshop.

Our popular rental brands were ITT and Pye/Philips. About four in five rental customers had coin meters fitted. Even today, we still have about two thousand of these meters in use.

Most people are amazed when I tell them this, although about seventy percent of the meters are fitted to our HP customers’ TVs. Initially this is to purchase the TV itself, then the VCR, washing machine, DVD, fridge, cooker etc. By the time these are all paid up, the TV is often ready for updating again and so the cycle continues.

Customers love this idea, with second and third generations of the same families requesting to have a coin meter fitted. Our collector empties these every ten weeks and adjusts the tariff easily as requested or required.

Our present meters are obviously electronic and simply adjusted by dip switch selection. In the early days though, quite a bit of engineering was required to make alterations.

Most of the know-how came from our genius of an engineer Eddie, now deceased, who spent many a long night filing out ten pence slots to suit fifty pence coins. Then, as time moved on, changing these fifty pence coin actions to one pound coin types, this also meant sourcing gears with different ratios to double the credit time when a pound coin was used.

Initially this was a lot of work but the benefits quickly paid off with the reduced frequency of emptying as the coin was smaller and it lasted twice as long...

...story continues in the next issue!

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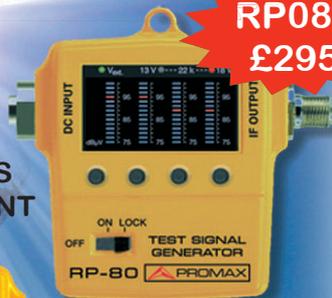
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