

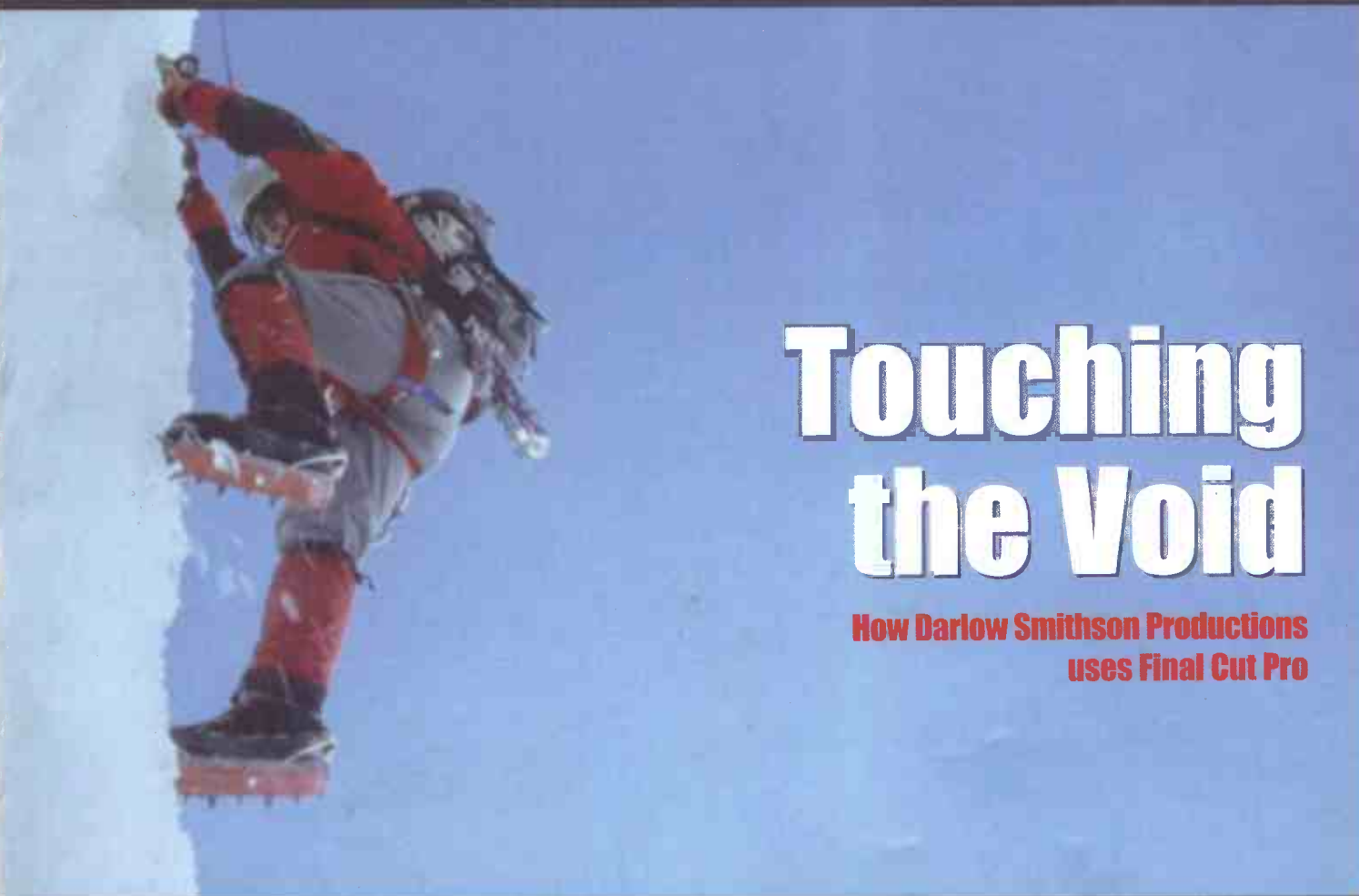
TELEVISION



AND CONSUMER ELECTRONICS

MARCH 2006

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Touching the Void

How Darlow Smithson Productions
uses Final Cut Pro

Days of 405-line television
revisited

Introducing Annie
spectrum analyser



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Horizon Digital Satellite Meter

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Better described as a small table set rather than a midget because although modest in outside dimensions, inside it has a chassis that is little smaller than a conventional table model and is exceedingly well put together.
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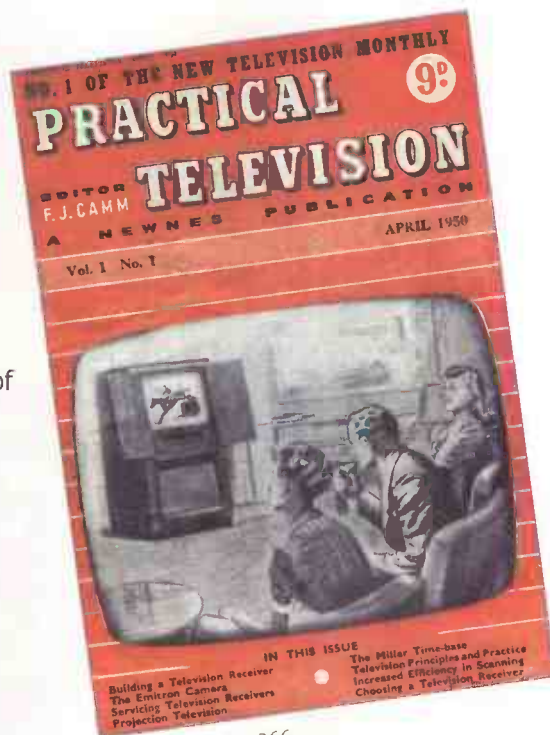
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BACK NUMBERS

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DVB-H(type)

Our news section covers a story about T-Mobile successfully beating off a patent court case. All over a Blackberry?

We have heard a lot of hype about DVB-H, and a commercial service is available from T-mobile, who launched n-tv in December 2003. Also, most carriers have launched mobile TV over 3G networks now, but more as a customer acquisition tool rather than a revenue stream.

Thomas Husson, an analyst at JupiterResearch's Paris office, covers the European Wireless market.

He believes the main question is which standard will win the war: DVB-H, MediaFlo or DMB?

Anticipating that 3G networks are not economically designed to support mass-market broadcasting, operators will have no choice but to switch to a dedicated broadcast technology.

Because mobile TV combines two of the most successful consumer products, most people tend to assume it is necessary a mass market service.

Mobile operators have invested billions in 3G and will be reluctant build new networks from scratch. Ericsson and IP Wireless (on the TDD spectrum) are pushing it. Alcatel is now promoting a satellite-base mobile TV solution as well.

When Verizon announced they would partner with MediaFlo, many insiders thought DVB-H was dead in the US. A couple of weeks later Intel, Nokia, Motorola, TI and Modeo (ex Crown Castle) announced they would form a partnership to "foster growth of Mobile TV and Accelerate DVB-H Deployment in North America".

"Just be patient," cautions Husson. "Consumer demand is there but it is not as significant as claimed in trials and in the press. Mass-market is far from being a reality."

That is the global picture but in the UK there is also another constraint - bandwidth. When some of that is released from the analogue

TV switchover, will any of that be available to DVB-H? We will have to wait and see.

100MB broadband

At the time of *Television* going to press, NTL announced plans to trial a 100MB broadband service in March, which will be limited to fewer than 100 homes.

The company will work with US-based ARRIS for the field trials, using the FlexPath bonding technology in its Cadant C4 CMTS and Touchstone Wideband Modem.

Peer-to-peer (P2P) software from BitTorrent will allow users to download a movie in about 10 minutes to download a film.

The technology will also allow NTL to broadcast several channels of high definition TV over the internet.

The ultra-speed connection, already commonplace in some parts of Europe and Asia, allows for services such as CCTV, video conferencing, gaming and multicast streaming of multiple HDTV channels.

The download service will offer a large variety of licensed video content for purchase in the UK, including popular films, music videos and TV programmes.

BitTorrent is currently one of the most popular ways to share pirated movies, TV and music over the internet.

The company has been talking to Hollywood studios and ISPs in order to find ways to use the peer-to-peer software to distribute legitimate, paid downloads.

BitTorrent traffic accounts for an estimated third of all internet bandwidth. BitTorrent Inc, set up last year, is trying to legitimise itself by getting content companies and ISPs to invest in its technology.

Scramble for flat panel market

There has been a flurry of announcements in the flat panel market in the last month.

Panasonic and chemical group Toray Industries have announced plans to build a new plasma display panel manufacturing facility in Japan.

The facility will be the fourth plant of their PDP joint venture, Matsushita PDP (MPDP), giving Panasonic the largest PDP production capacity in the world, claims the company.

With an investment of 180 billion yen, what is claimed to be the world's largest PDP plant will be situated next to MPDP's third PDP plant in Amagasaki, Japan. The new plant will have a production capacity of 6 million panels per year (calculated on the basis of 42-inch screen-size panels).

MPDP will start construction of the new plant in May this year with production scheduled to commence in July 2007. When it reaches its full capacity by March 2009, Panasonic's total PDP output will be lifted to 11.1 million panels per year.

"The new systems and technologies will bring

greater mass production efficiencies to the whole process while ensuring higher quality. Our new process technology allows a single substrate to yield up to eight 42-inch panels, the highest number in the world," said Ken Morita, President of MPDP.

"Panasonic anticipates the global PDP market will expand to 25 million panels by 2010. With its annual output capacity of over 11 million panels, we aim to be the world's top manufacturer of PDPs by enhancing our global share to over 40 percent."

Meanwhile, Samsung Electronics has begun shipping 32" and 40" LCD TV panels produced on its newly opened second 7th Generation (7-2) Line. Samsung expects to reach its full capacity of 45,000 units per month for the first phase by the end of June.

Samsung LCD Business President Sang Wan Lee, along with 200 employees, attended a special ceremony for the 7-2 LCD Line, which is dedicated to the production of large-screen TV displays.

Samsung posted net income of 2.56 trillion won, on revenue of 15.52 trillion

won. Operating income for the fourth quarter was 2.14 trillion won, compared with 2.13 trillion in the previous quarter.

Net income in the fourth-quarter increased 36% compared with the previous quarter, while revenue jumped 7% compared to the previous quarter.

Revenue and operating income growth for the quarter were driven by continued strength in the Semiconductor and LCD businesses.

Recently the company claims to have developed the largest single-panel active matrix-based Organic Light-Emitting Diode (OLED) display at 21 inches, as well as the highest resolution at 6.22 million pixels.

Samsung has become the global market leader for OLEDs with a 28.4 per cent share, ahead of RiTdisplay of Taiwan with 20.5 per cent and Pioneer with 13.7 per cent.

Philips Electronics showcased its latest LCD panel, ClearLCD TV, at the 2006 Consumer Electronics Show (CES). ClearLCD is said to feature backlight scanning, advanced motion

sharpness and superb contrast in dark scenes.

The company claims it reduces the number of lamps and drivers within the display from 16 to eight, at the same time increasing the light output by 300%. Additionally, the display features high-output fluorescent lamps operating in scanning modes that cancel out the sample and hold-effect found in typical LCD displays.

Improved darkness contrast is created by utilising the Deep Dynamic Dimming (D-3) technology according to the appropriate brightness and stretches the video for better detail.

"Philips Lighting and Philips Consumer Electronics have worked closely to improve the picture quality of LCD and expect that this breakthrough technology will be applied rapidly in several model sizes of Philips' LCD TV portfolio," said Theo van Deursen, CEO of Philips Lighting.

LG Philips LCD, the world's second-largest flat-screen maker,





NTL ups Virgin Mobile offer to £917m

reported a massive rise in net profit in the fourth quarter but disappointing forecasts hit the shares in New York.

Sales of global flat-panel displays showed an upturn in the second half of last year, however, there are growing fears in the industry about a possible return to over-supply this year, due to a rapid capacity build-up.

The joint venture between South Korea's LG Electronics and Philips of the Netherlands reported a net profit of 328 billion won in the October-December period, compared with only 35.4 billion won a year ago. Sales increased to 2,963 billion won from 1,933 billion won.

LG Philips LCD expects the momentum to continue this year on the back of the soccer World Cup and the winter Olympics. But analysts fear rapid growth in LCD production capacity could lead to an oversupply of panels this year and increasing depreciation costs from the new production line would weigh on LG Philips LCD's earnings.

Lehman warned that prices of large-size TV panels above 40 inches could fall below cost due to increasing competition with plasma display panels.

The market for flat screen televisions is expected to soar by 80% this year, with worldwide demand topping about 44 million units. Chinese manufacturers will soon be able to produce low-end flat screens at a rate that will destroy pricing power in small screens.

NTL has improved its offer for Virgin Mobile by 10% to £917m after the company's majority shareholder, Sir Richard Branson, agreed to accept less for his shares than other investors, valuing the group at £930m.

Sir Richard's Virgin Group would receive 349p a share in a mix of cash and NTL redeemable stock for its 71.3 per cent stake if the deal goes through.

Virgin Mobile Minority shareholders are being offered 372p for their shares, 15% up on the 323p NTL made in December. The outcome of the takeover may depend on

the position of Virgin Mobile's two biggest minority shareholders - Fidelity and Morley Fund Management - both of which own about 7 per cent of the company.

Fidelity is considering whether to ask the Takeover Panel to examine whether the offer could unfairly disadvantage minority shareholders because of the licensing income Virgin Group will receive from NTL if the deal goes through, which makes the transaction more valuable to Sir Richard than to other shareholders.

If a deal is concluded

successfully, Virgin Group is expected to enter a straightforward brand licensing deal with NTL, giving it the use of the Virgin name in return for around 0.25 per cent of annual revenues.

The deal would allow NTL, which is already in the process of merging with Telewest, its only UK rival, to offer subscribers a mobile phone service as well as pay-TV, internet access and a traditional telephone service.

NTL's share price has increased since its interest first became public before Christmas, raising the value of the paper offering.

News in brief

A one-day course is being held at the College of North West London on Monday April 3 to acquaint practicing engineers with HDTV and its applications to television reception. The course will cover all aspects of HDTV encoding, decoding and HD Ready receivers. For further details contact Fawzi Ibrahim on 07976 350724.

Arqiva, formerly NTL Broadcast, is trying to form a consortium of mobile phone operators to pressurise the media regulator, Ofcom, into releasing spectrum for a mobile television service. DVB-H, will not be available nationwide until the analogue TV spectrum is switched off in 2012.

A number of Panasonic's Plasma Display Panels have already been installed into Special Needs Schools with the touch panel feature which has worked very effectively with the children. By using this method of teaching pupils become more involved and interactive whilst learning along the way. The Touch Panel, already an accessory to the 42" & 50" PDP's, is now available for the 65", making it the largest interactive Plasma Display in the world. These screens provide outstanding resolution and are easily operated by use of a touch-pen.

STMicroelectronics has introduced a dual-channel single-chip high-definition TV processor. Manufactured in 90nm CMOS technology, the STD2000 processor can decode and display both analogue and digital broadcasts, while eliminating multi-path interference and adjacent-channel noise. The device can decode two simultaneous standard-definition (SD) signals.

Viewers will be able to email questions to a nutritionist and receive a free box of cereal bars through a new interactive TV commercial created by Red Bee Media, formerly BBC Broadcast, for Waitrose's 'Perfectly Balanced' range.

Paris-based Vivendi has agreed to pay Matsushita Electric Industrial \$1.15 billion to gain full ownership of Universal Music Group and raise its stake in NBC Universal. Universal's share of global recorded music sales is 25.5%, according to the International Federation of the Recording Industry.

NAB confronts RIAA on encryption proposal

The US National Association of Broadcasters (NAB) has taken the Recording Industry Association of America (RIAA) to task over its proposals for 'encryption at the source' content protection for digital radio.

In January, David Rehr, president & CEO of NAB, wrote to Mitch Bainwol, chairman and CEO of the RIAA, to express his industry's strong interest in collaborating to find a workable solution to content protection issues associated with terrestrial digital radio broadcasting.

Rehr wrote: "The goal for our industry is to find a resolution that balances protection of copyrighted works against the important objective of ensuring the continued and rapid expansion of digital audio broadcasts.

"As a matter of initial discussion, NAB questions the degree to which HD Radio threatens copyright or will facilitate unautho-

rized, digital distribution of sound recordings.

"Those desiring to obtain and listen to pure, uninterrupted performances of sound recording in lieu of radio already have an abundant number of means to do so. Peer-to-peer file sharing and the hours of uninterrupted music that can be stored on CDs and discs are but a few such means.

"iPod uploads and digital music on the Internet would seem to present much larger and more immediate threats to copyright holders. As such, NAB believes the scope of any piracy risk associated with HD Radio is likely more limited than RIAA has previously asserted.

"However, as content creators ourselves, radio broadcasters oppose piracy in all its forms and therefore hope that we can find an amicable solution to this issue.

"We understand from previous conversations that

the RIAA has advocated a number of proposals that would set back the HD Radio rollout and be unacceptable to broadcasters.

"For instance, RIAA has previously suggested broadly empowering the FCC to mandate that all radio broadcasters encrypt their digital content at the source. This approach is antithetical to the concept of free, over-the-air broadcasting. No U.S. free, over-the-air broadcast service, analog or digital, has ever been required to encrypt its transmissions."

Rehr concluded: "We believe that RIAA's encryption proposal is not viable and we strongly oppose such an initiative.

"However, despite our objections to encryption at the source approaches, we do believe that there are possibilities for technical solutions that would offer effective content protection without slowing digital radio's advancement."



Motorola acquires KreateL

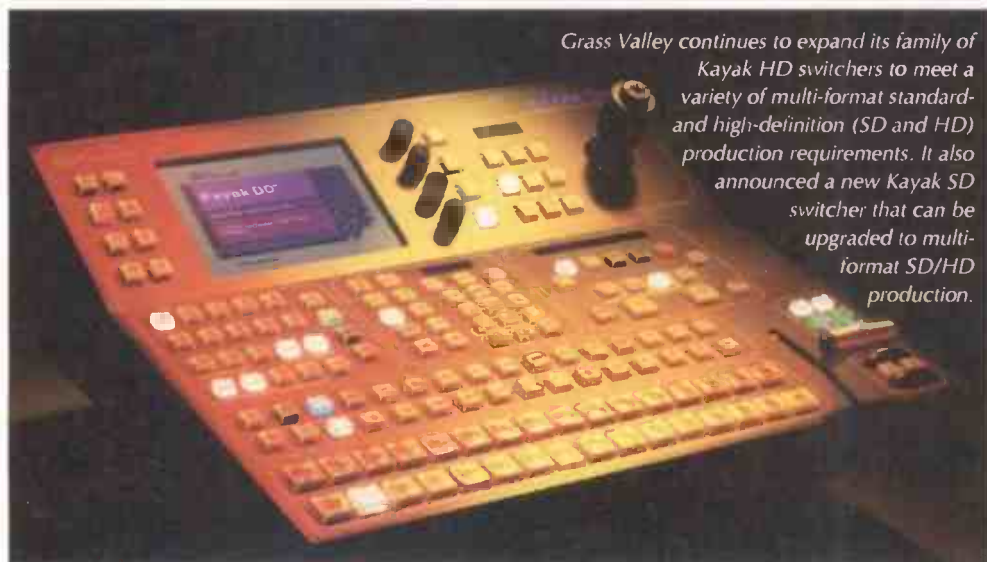
Motorola is to acquire KreateL Communications, a Swedish developer of IPTV-based digital set-top boxes.

KreateL's Linux-based set-top box is a natural complement to Motorola's end-to-end digital video technologies. Motorola offers flexible solutions throughout the cable, xDSL, and fiber-to-the-premise (FTTP) video chain - including network infrastructure, video head-end and transport, industry-leading MPEG-4 encoding, and connected home devices.



"Motorola has an unmatched heritage of deploying and supporting video networks worldwide, and will enable more service providers to utilize the benefits of the KreateL platform," said Lars Bengtsson (pictured), CEO of KreateL.

The agreement is expected to be completed during the first quarter of 2006. KreateL's management team and employees will remain in Linköping, Sweden, and will be integrated into the Motorola Connected Home Solutions business.



Grass Valley continues to expand its family of Kayak HD switchers to meet a variety of multi-format standard- and high-definition (SD and HD) production requirements. It also announced a new Kayak SD switcher that can be upgraded to multi-format SD/HD production.

Sky launches legal movie downloads

Sky has launched two new services - 'Sky by broadband' and 'Sky by mobile' - that will allow customers to download movies as part of their existing subscription.

Broadband now accounts for 57.4% of all UK internet connections (source: National Statistics, September 2005.) Almost half (47%) of all Sky digital customers have broadband connected PCs, compared to a national average of 38%.

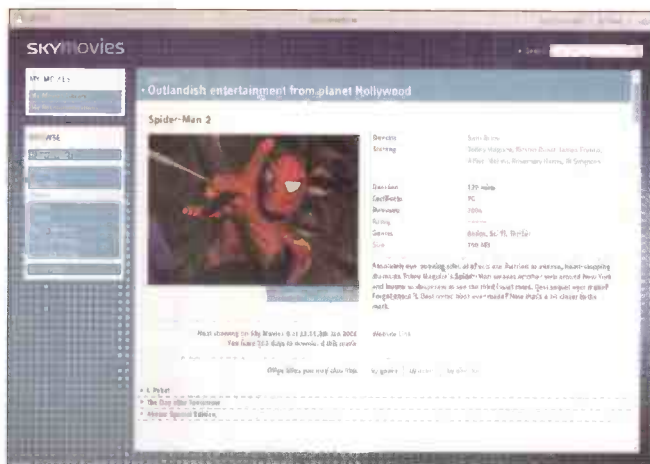
Sky by broadband lets viewers legally download movies and highlights from Sky Sports and watch them on their home PC at no extra cost.

More than 200 movies are available at launch including a mix of

Hollywood blockbusters such as Spider-Man 2 and The Day After Tomorrow, and cult-classic Sky Movies titles from Alien: The Director's Cut to Dr Strangelove. The number of titles will increase over time to encompass over a thousand titles from the Sky Movies catalogue.

The service offers a complete A-Z movie listing and search by genre function. Users can set their movie preferences and searches can be sorted by director, film name, and actor allowing viewers to create their own movie download library.

The service will also include over 1,000 Sky Sports video clips at any



one time including highlights of every Barclays Premiership and UEFA Champions League match.

Sky by mobile gives Sky digital and Sky Bet customers access to Sky entertainment, sports, news and weather on the move. It is available across multiple networks on a range of handsets that are compatible with GPRS or 3G.

Meanwhile, News Corp

chairman and chief executive Rupert Murdoch has hinted that the satellite TV group was looking to enter the wireless broadband market.

DirecTV could spend \$1bn to develop a high-speed data product to offer video, voice and data services. One approach would be to deploy a wireless broadband service based on the emerging WiMax technology standard.

Tektronix kits out HD vans

TVN, a leading German television production company, has extended its HD and SD measurement capabilities by installing Tektronix technology in its newest HD Outside Broadcast (OB) truck.

Because critical broadcast events don't always occur where a fibre optic connection is conveniently located, TVN has developed a fleet of OB trucks designed with flexible configuration capacities.

Fully operational in early 2006, the "TVN-Ü3HD" truck is geared

toward HD production but can process all TV standards, regardless of format. Ü3HD can be equipped with up to 24 cameras and is designed to cover complex shows as well as all kinds of sporting events.

The new TVN HD OB truck will be equipped with Tektronix WVR7100 SD/HD Rasterizers, WFM700A Waveform Monitors and TG700A Multi-format Signal Generators. WVR7100 Rasterizers will also be used within TVN's

expanding corporate TV studio operations.

"We have relied on Tektronix for many years," said TVN General Manager Frank Hähnel.

"With HD, quality assurance is even more important and more complex. Additional high-quality

measurement instrumentation allows for interdisciplinary and unrestricted signal supervision.

"Thus, with the addition of the WVR7100 rasterizer and WFM700A waveform monitor, we are prepared for the increasing, long-term requirements for first-class television production."

Tektronix's substantially upgraded WVR7100 rasterizer now includes Dolby E and Dolby Digital (AC-3) capabilities. The multi-format WFM700A provides the tools needed to perform operational monitoring tasks such as checking signal validity and content quality, level setting and signal path verification.

TVN will also use Tektronix's TG700, a multi-format, analogue and digital precision signal generation platform.



Sling Media Raises \$46.6 Million

Sling Media has closed a \$46.6 million round of financing led by Goldman Sachs, Liberty Media and EchoStar.

Allen & Co, Doll Capital Management, Mobius Venture Capital, The Hearst Corporation and other undisclosed investors also participated in the financing.

"We are delighted to receive financial backing from some of the true pioneers in the industry," said Blake Krikorian, co-founder and CEO of Sling Media.

Sling Media's first product, the Slingbox, is a device that enables consumers to watch TV from PCs and Windows PDAs.



Cisco's entry into consumer electronics

Cisco plans to use its Linksys home networking division, acquired in 2003, to enter the domestic electronics market.

Charles Giancarlo (pictured), head of Linksys and chief development officer at Cisco, implied that devices that can link to the internet gave the company an opportunity to compete in the market with the likes of Sony, LG Philips, Samsung and Panasonic.

Linksys makes wireless network products aimed at home and small business users. Last November it bought set-top box and digital video recorder manufacturer Scientific Atlanta for \$6.9bn.

"Consumer electronics



companies have been able to compete on a stand-alone devices but the dynamics of the market are changing. The internet and new networking requirements are enough of a disruptor for us to enter a new market," he said.

Giancarlo joined Cisco in December 1994 through the acquisition of Kalpana. He believes that Cisco's close relationship with companies such as Google and Yahoo will also give it an advantage over consumer electronics companies.

T-Mobile wins Blackberry case

International law firm Bird & Bird has acted for T-Mobile UK in a patent infringement claim brought against it and Research In Motion UK (RIM) by Luxembourg-based patent holding company Inpro Licensing relating to the supply of Blackberry devices.

The High Court decision was in favour of T-Mobile and RIM, invalidating Inpro's UK Patent.

T-Mobile is one of the largest suppliers of Blackberrys in the UK.

James Blendis (pictured below), Legal Director of T-Mobile (UK) said: "We hope that we can now move on with our mobile internet business, whether on Blackberry or on any other mobile device."

Inpro's patent (EP 0892947) covered a computer system which reduced the processing power used by portable computers and other devices in accessing servers on the internet.

It described using a "proxy-server" to download data from the web on behalf of the device.

The proxy-server then 'transposed' the data to match the specific size and resolution of the device.

RIM applied to the English High Court to revoke the patent on the grounds that it was invalid for lack of novelty and obviousness.

Inpro counter-claimed for infringement of the patent and joined T-Mobile into the proceedings.

Mr Justice Pumfrey who gave judgment held that all the claims in issue were either obvious or lacking in novelty.



Bournemouth auditorium harnesses cables

Kabelschlepp cable carriers have been chosen to carry power and control cables to a new truss system that supports lights, cameras and sound equipment in the Solent Hall, the new auditorium in the Bournemouth International Centre.

The system designed and installed by Luton-based Hall Stage features two large trusses measuring approximately 10m² and four smaller ones, all equipped with Kabelschlepp's K-Series carriers supplied complete with cables and terminations.

The trusses are lowered from the ceiling for deployment and the cable carriers ensure that power is delivered smoothly and continu-



ously to the equipment at every stage.

Bournemouth International Centre is run by Bournemouth Borough Council. Technical facilities include RF television distribution, Sennheiser infra-red amplification for hearing-impaired customers and broadcast capability via the BBC Radio Solent studio, which is on the premises.

Wasted energy could power 850,000 homes

Digital TV broadcasters, manufacturers and retailers are being urged by the government not to promote or sell those "set top boxes" which waste energy.

Environment Minister Elliot Morley is urging all the major digital TV broadcasters, service providers and retailers to register and adhere to the EU Code of Conduct, which sets energy efficiency standards for digital TV equipment voluntarily.

Morley says: "We have seen a dramatic increase in the sale of digital TV equipment such as set top boxes, and millions of energy-wasting products are flooding through high-street retailers. We could end up wasting enough electricity to power 850,000 homes."

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Sony's name is known internationally for innovation and quality. And to maintain our reputation and world no.1 position, we must continually ensure that our after-sales support infrastructure provides the best possible service for all our customers. With this in mind, we are seeking to recruit a **Regional Service Executive, covering Northern Ireland and the Republic of Ireland.**

You will manage and report on third-party central repair operations and the Authorised Service Centre network; use benchmark key performance indicators to assess individual accounts, and provide all support needed to meet our current standards as well as future technology requirements. Additionally, your remit will include the evaluation of new service account applications, making decisions on the outcome, and the delivery of technical assistance at trade shows and exhibitions.

Sony provides a wide range of support for service accounts, and another part of your role will involve monitoring the standard of technical advice, training and other aspects of the company's provision, keeping a careful eye on repair and product quality, and most importantly, customer service.

You will also liaise with Sony retailers, ensuring that they receive the correct levels of support from the Authorised Service Centres and central repair operations.

This is a varied and interesting role that calls for a great deal of self-discipline - you'll work mainly from home, devise your own call plans and act independently as well as in a team.

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50+ years ago

By Keith Wilson

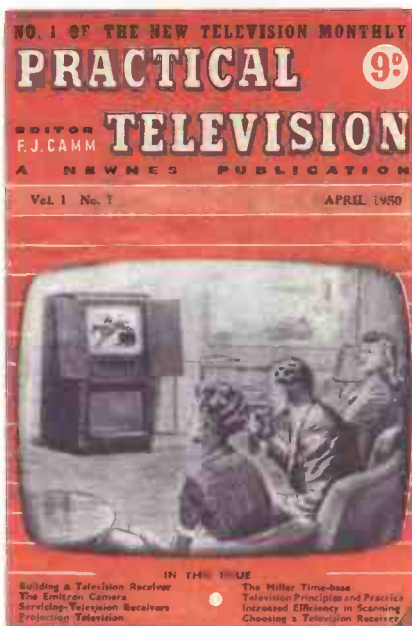
We have to 'bend' our title a little this month, as 50 years ago, in March 1956, a printers' strike meant that *Practical Television* was not published. We have taken this opportunity, therefore, to go back a little further to 1950.

Issue 1 of our magazine appeared in April 1950 and as you will see, this was before the era of the full-colour cover. Instead we have a typical period illustration of a very middle-class family enjoying a programme of show jumping on their brand new televisor. Note the doors - many people apparently found the 'staring eye' of the screen to be unacceptable when the set was not in use.

In fact, the illustration shows quite a large screen for the time, when many people could afford no more than a 9- or 12-inch set. It is still a far cry, however, from a 42-inch plasma flat panel.

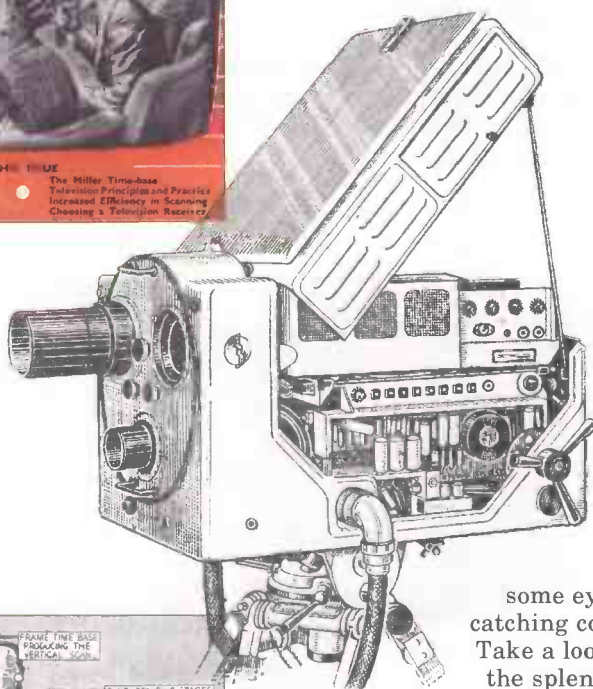
The lead article will strike a chord with modern readers when it states: "television has been transformed by the introduction of the high-definition system."

It is sobering to reflect that, in 1950, 405-line television was high definition, representing as it did a



Above: "Dad, how long till *East Enders* starts?" "About 35 years!"

Right: A CPS Emitron camera with the hood up.



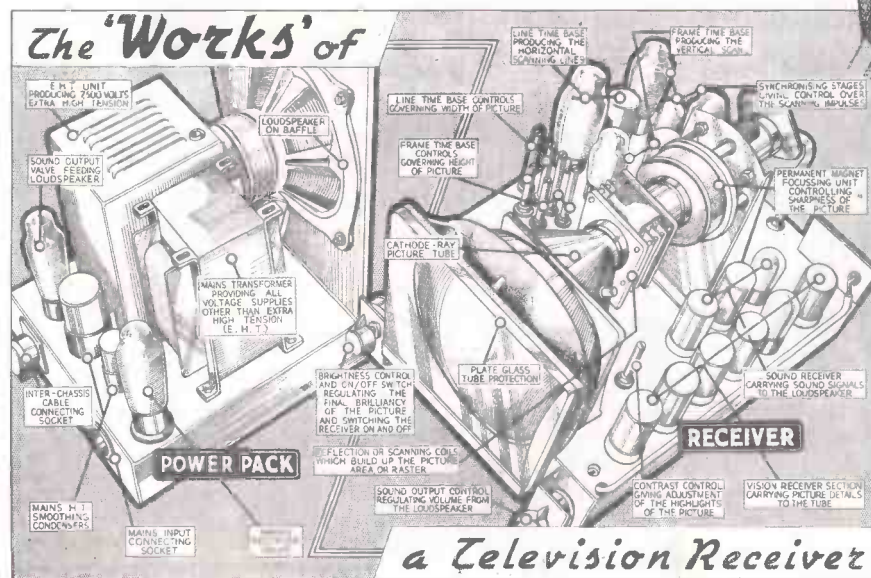
some eye-catching content. Take a look at the splendid drawing of

the works of a television receiver, for example.

It would have been interesting to draw parallels between this set and a modern receiver, except that there are almost none. Just about the only component a 1950s engineer would easily recognise in a modern flat-screen set is the loudspeaker.

The location of the controls shown in the drawing seems a bit unusual - it cannot have been too convenient having the contrast control in the middle of the chassis.

This is especially so, as another article suggests setting the contrast to minimum before



Television technology, 1950s style.

switching your television on, and then adjusting it with the aid of the tuning signal every time the set was used.

The magazine also catered for those who wanted to know about programme origination and transmission. There was a block diagram of the studio set up, complete with almost-forgotten devices like shading generators, and detailed illustration of one of the latest cameras - the CPS (cathode potential stabilised) Emitron.

The article makes much of the increased light sensitivity of this British-developed camera compared with the Iconoscope which, it takes great pains to point out, had its roots in America. Even in those days, a promotional message occasionally crept into articles.

Just as today, the launch issue



included much to interest those involved with servicing television receivers. The Miller timebase was explored in detail, and the boost-HT system, widely used in valve receivers to increase the voltage available for the

timebases, was also explained.

There was even a two-page article with the snappy title 'Servicing Television Receivers'. Given the correspondence and articles in recent issues, it is interesting to note that this article is illustrated with pictures of two AVO instruments.

The Model 7 (1,000 ohms-per-volt sensitivity) is captioned as being suitable for all normal servicing. One can only assume, therefore, that the Electronic AVO, also shown, is intended for abnormal servicing!

A feature that would be unlikely to find a parallel in a 21st-century issue of *Television* is a full-page description by television announcer, Mary Malcolm, of how she made the transfer from ordinary radio (her words) to the television service.

The editor clearly believed that by exploiting the cult of the celebrity, he might sell a few extra copies. Actually, thinking about it, maybe not that much has changed after all.



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using subject heading 'Television Letters'

Band III Converters

Your article '50 Years Ago' (Jan 2006) reminded me of Band III converters and single channel TVs, and prompted me to search the 'nostalgia store' for the converter in the photograph.

This unit supplied, so the label says, by Opperman of Borehamwood, Herts, is a self-contained unit with separate aerial inputs for Bands I and III and a output to the Band I TV.

Selection of channels is by a switch on the front panel alongside the tuning knob, which operates a three-vane variable capacitor. The power supply uses a half-wave selenium rectifier (the sort that always went high resistance). The frequency conversion uses an ECC85 double triode.

In 1955 we in Suffolk were on the

fringes of the Alexandra/Crystal Palaces and Croydon, and I guess this is how the Opperman converter started its days. I obtained it in the 1960s glued to the top of a Pye V4, which was a single channel TV with an IF strip, and was tuneable over the Band I range.

I seem to remember it worked well in the days when we had local transmitters at Manningtree (BBC channel 4) and Mendlesham (Anglia channel 11). How it worked for fringe reception I do not know, but the use the wafer switch for changeover and some of the unscreened wiring makes one conclude a few dBs were being lost.

An interesting comparison with the Freewave boxes of today!

Nigel Crisp, Hadleigh, Ipswich.

Licence to steal?

Regarding the recent correspondence over the television license fee, I think the answer is very simple.

In 2012, or whenever the analogue transmissions are switched off, the license fee should be scrapped. The BBC could then encrypt its programmes and anyone wanting to watch them would have to buy a viewing card

Martin McCluskey,
Bishop Auckland, Co. Durham.

On to retirement

After some 50 years in the trade I have now decided to hang up my AVO and retire.

Please allow me through your columns to say goodbye to the many friends I have made over the years and make a few observations on how things have changed during that time.

After passing an entrance exam I joined the trade as an apprentice with a large local electrical company who had a retail outlet almost as an afterthought.

My starting wage was £1:14:7 in old money. We were kept quite busy at the time. TRF sets were still plentiful and when ITV started, many happy hours were spent drilling expensive wooden cabinets to fit Cyldon tuners to enable multichannel reception to be achieved.

Philips projection sets were one of our specialties and I become quite adept at changing the small CRT and resetting the optical unit.

Following the start-up of FM radio broadcasts, another job I was blessed with was drilling equally posh cabinets on expensive radio-grams to fit the new FM tuner kits to enable high quality radio broad-



casts to be received. Although wages were relatively poor, the job carried status and good engineers were valued and jobs plentiful.

How things have changed over the years! Retail Price Maintenance was abolished and the rat race started. At about that time I moved to another large local company that also regarded their retail outlet as secondary but it was one of the best jobs I have ever had.

Colour Television was the new mantra and a great deal of time was spent learning about the new principles and techniques used.

At the time it was thought that engineers with the new colour qualification would command high wages but that was not to be.

After a number of years the boss decided to retire and sold off the various sections of the business to interested parties.

Surprise surprise there was little interest in the retail shops and all the staff including myself were made redundant - not a pleasant experience!

I quickly found another job at Curry's, with the service arm trading under several guises but ending up as Mastercare.

Working for a large national company was quite a culture shock especially when the company was taken over by Dixon's.

After some fifteen years I returned to my roots and moved to another local company whose only interest was retailing. Seventeen happy years later I am about to depart for the last time.

From a technical viewpoint, the changes over the years have been overwhelming.

While we have to accept that what is now on offer to the public is far superior in terms of choice and sophistication, the picture quality of modern digital equipment is most certainly inferior to a well designed analogue television working under good signal conditions. Anyone who doubts that is simply not living in the real world.

In terms of where the trade now stands I almost despair. Price erosion over recent years has taken almost all of the profit out of trading.

As a result everyone is cutting costs no matter what the outcome may be.

At a time when products have never been more complicated, the technical support from even the few remaining major producers is minimal, and as a result, we as engineers are hung out to dry.

My only hope is that as the shortage of good engineers intensifies, things will begin to improve for those that are left even though the job spec will inevitably have changed.

However, despite all the problems in the trade during the last fifty years, there has hardly ever been a day when I have not looked forward to going to work - I only hope that retirement will be as rewarding.

John Royce,
Wigston Magna, Leicestershire.

Meteor radio kit

I found the article on the Meteor radio kit in the January issue very interesting.

In the late fifties when I was about 14 I found a very similar radio in a dump. It looked identical to the one in the picture but it did not have a transformer - just a large dropper resistor, which was damaged.

There was no case - just the chassis. I cleaned it up, repaired the torn speaker with Sellotape, rewound the resistor with resistance wire (acquired from Home Radio?), a tuning dial made from cardboard and away it went.

It sat on my bedside table where I listened to Radio Luxemburg and it provided both heat and light from the obviously over-run valves due to my 'iffy' repair. It never occurred to me (or my parents) just how deadly it could have been.

I am not sure how long it lasted before ending up back on the dump! I then joined the Royal corps of Signals and later worked for the Electricity supply industry but I have always had a keen interest in all things electronic.

I have been reading Television, and still have all the magazines, since 1976. When I left the Army, I was planning a career in Radio and TV but found the ESI paid better.

Gordon Leitch, Dunbar, Scotland.
I was very interested to read Ray Porter's on renovating the Meteor III radio. There are two points I

would like to raise.

The first concerns the operation of V1, which is employed as a reflex amplifier. This mode of operation is probably unfamiliar to younger readers, and simply means that the valve is used to amplify RF and audio signals simultaneously.

The audio signal from the germanium demodulator diode is introduced into V1 through the grid resistor R3, so the output of V1 consists of amplified RF, conveyed to the second tuner circuit via C1, and audio which is fed in through C8 to the output audio amplifier V2.

This technique enables a three-valve function to be achieved using only two valves. Non-linearity will result in some inter-modulation of the RF and audio signals, but since they are coherent, this will result in distortion only, and not interference.

My second point concerns the mains rectifier V3, an EB34. This valve consists of a pair of signal diodes and was not designed as a power rectifier. According to my 1961 Radio Valve Data Book, the EB34 is rated at 200V RMS at a current of just 0.8mA!

Assuming the data to be correct, the requirement of the Meteor III circuit exceeds these limits and I wonder how reliable the valve function can be under such conditions.

Any failure is likely to be catastrophic, taking the form of flashovers or internal shorts. Should this happen, R8 will probably catch fire before burning out, since it is fed directly from the mains supply.

I believe it would be prudent to add a low-rating fuse, say 100mA, in series with R8 to maintain safety. The 3A fuse in the mains plug cannot provide adequate protection.

An alternative might be to remove V3 and hard-wire an IN4004 diode across the appropriate pins. Purists may argue that this compromises the integrity of the renovation, but safety and reliability would be improved.

I am glad that Ray's friend has decided to treasure the set rather than use it.

Keith Cummins,
Deal, Kent.

Introducing Annie

By J. LeJeune

Anyone setting up or troubleshooting aerial installations or distribution systems will know the value of a dedicated Spectrum Analyser.

Add the following to the usual basic features, and you have approached the ideal:

- A colour display of television pictures
- Automatic switching of measurement and display of digital or analogue TV signals
- Digital TV service identification
- Quality assessment of the signal by coloured bar graphs of signal-to-noise ratio and by bit error ratio
- In-built attenuation up to 64dB in 1dB steps
- Signal overload warning
- An indication of the number of channels within the multiplex under examination

Annie 204 from Swires Research of Laindon, Essex, embodies all these features in a portable instrument with simple and quickly learned push-button operational controls. A neat flip-over instruction manual aids the learning process.

The instrument covers 30-860Mhz for terrestrial signals and the Satellite IF band of 950-2150MHz via a single RF input of the 75-ohm BNC type.

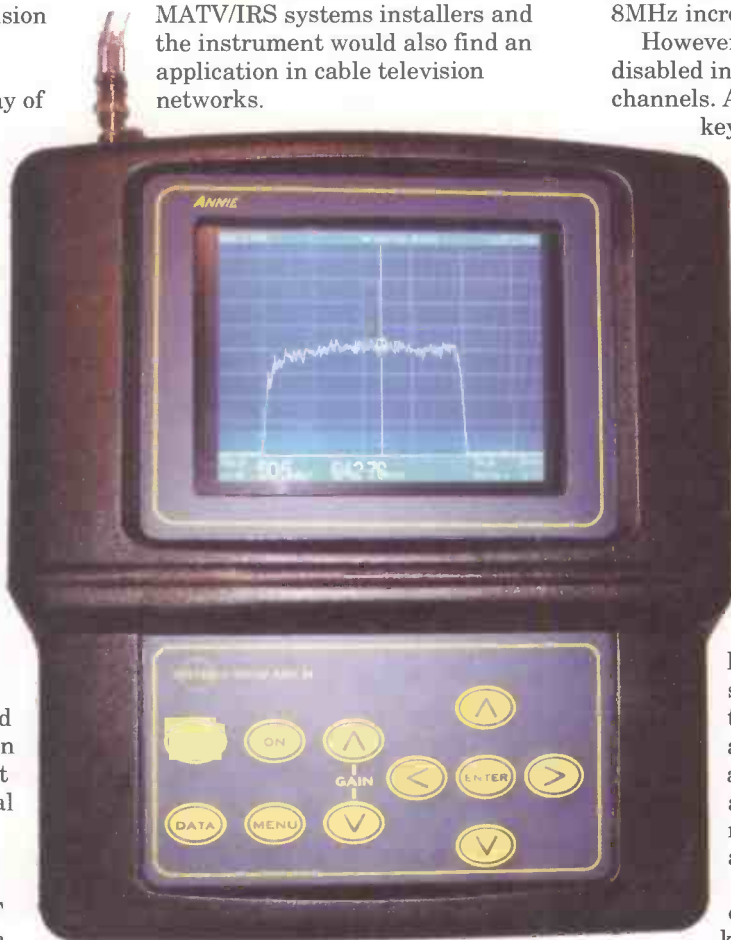
Swires Research has designed and produced its own tuners to obtain the high performance necessary for the instrument. In the terrestrial band the analyser covers analogue PAL signals, though other TV standards may be supplied to order, and digital signals.

DTS decoding

The Satellite system uses DTS decoding for digital free-to-air signals only. With a minimum input level of 20dB μ V (10 μ V) and a maximum of 120dB μ V (1V), the analyser will deliver accurate results in a wide range of applications.

Accuracy on terrestrial signals is better than ± 1.5 dB and on satellite IF better than ± 2 dB and the indication of signal level can be changed from dB μ V to dBmV from the setup menu.

This widens the appeal of the instrument to both aerial and MATV/IRS systems installers and the instrument would also find an application in cable television networks.



The Annie keypad is splash proof.

A separate 75-ohm BNC socket is supplied for a video input and a further BNC socket is added for a video output from the analyser. Audio output is at headphone volume and a pair of headphones is supplied.

The control of the analyser is from a tough but responsive and friendly keypad, though some users may prefer to connect an external keypad via the PS/2 connector supplied.

A USB type B data connector permits interfacing to a computer. A single press of the ON key brings the analyser into life and after a ten-

second initialising period, displays the full terrestrial UHF band.

Channel Lock facility

A useful feature of this instrument is the Channel Lock facility that allows the UHF channels to be stepped-through sequentially in 8MHz increments.

However, this feature needs to be disabled in order to view VHF channels. A second press of the ON key changes the analyser to Satellite mode.

If you are used to working with computers you will be at home with pressing the 'menu' key, for it brings a drop-down menu window into being from which many of the functions of Annie 204 can be selected or disabled.

When in terrestrial mode only the terrestrial measurement functions will be displayed. The menu allows you, via the keypad up/down keys, to select a peak hold facility, the Channel Lock feature, a digital multiplex list and re-scan, trace store and recall, store and recall 'favourites' and an audio volume adjustment.

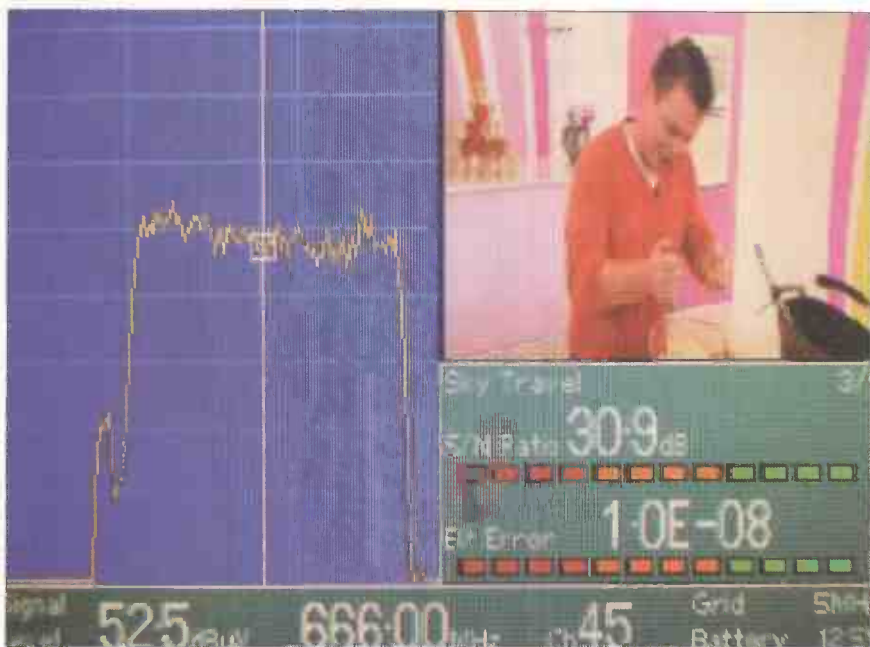
In normal (not menu) operation, these up/down keys operate a zoom

function on the analyser's trace. The left/right keys move the frequency selection up (right) or down (left).

Pressing the 'data' key changes the display to a triple screen mode that shows the analyser trace, the TV picture and below it relevant data such as signal level, BER and a signal quality bar graph.

In this mode the up/down keys perform a 'channel change' function on digital services within the multiplex being examined, stepping through the selection available.

Note that encrypted services are not deciphered. The 'peak hold' facility is useful in obtaining a steady reading on amplitude-modulated terrestrial analogue



Pressing the 'data' key changes the display to a triple screen mode.

vision carriers where signal level is dependent on picture content to some degree.

With a full-screen display there are status bars above and below the spectrum trace. The upper bar displays the start and stop frequencies of the scan and whether the signal being examined is digital or analogue.

The lower status bar displays signal level, the frequency at the cursor position, the graticule divisions in frequency, and the battery voltage.

The status bars are present at all times on the spectrum display in both terrestrial and satellite modes. Annie tells you everything you need to know.

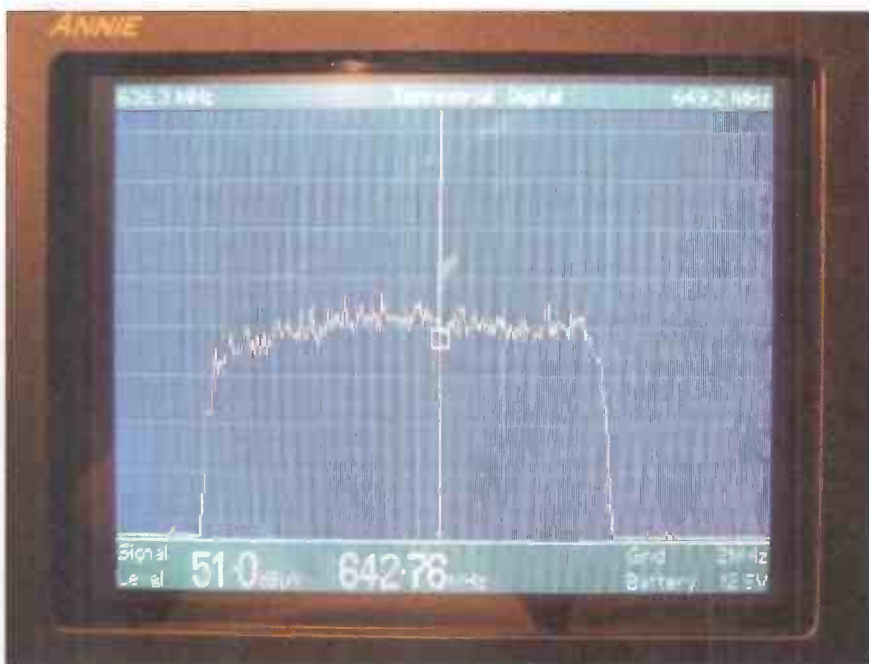
Measurement of signal level is made in the centre of the carrier with Channel Lock activated and reverts to a left-hand side position when Channel Lock is switched off.

A faint white band across the bottom of the screen indicates the area in which no measurements are possible due to insufficient signal level.

Fine scan option

Scan speed is slow when the fine scan option is selected and is ideal when examining the full terrestrial band from 30-860MHz, but automatically adjusts to a faster scan when the zoom facility is used to examine a particular segment of the band.

Line power at 12V is available for activating terrestrial masthead amplifiers and when this facility is



With a full-screen display there are status bars above and below the spectrum trace.

used a red warning legend appears in the upper status bar. On un-amplified aerials this powering facility must be switched off from the terrestrial menu.

In satellite mode LNB power is available from the analyser, 22kHz tone, and DISEqC switching for A or B inputs on multi-switches can be activated from the satellite mode menu.

Interestingly, the display is calibrated in the satellite downlink frequencies instead of the IF so as to make looking for transponder signals easy and thus avoid any error in mental conversion to IF frequencies.

The horizontal divisions of the

graticule depend on the zoom setting and vary from 1MHz per division up to 50MHz per division in both satellite and terrestrial modes.

Triple-screen

With the triple-screen facility in use, accessed by pressing the 'data' key, a picture is available on all terrestrial and digital satellite free-to-air services.

On terrestrial analogue signals the position of the cursor may have to be adjusted to obtain good picture and sound. The frequency sweep display is now displaced to the left hand side of the screen and to the right of it is the TV picture and the data readout of service, number of services in the multiplex, Signal-to-Noise ratio, and the Bit Error ratio.

Signal-to-Noise and Bit Error ratios are also represented by

coloured bar-graphs that show red for bad signal, orange for marginal and green for good signal conditions – useful for when you are up a ladder and have left your glasses in the van!

Frequently used 'favourite' channels can be stored for rapid recall and there is room for 100 terrestrial and 100 satellite channels within Annie.

A time-saver is the ability to set up the instrument to boot up on a particular favourite channel. Favourites can be named and the name changed if desired, recalled traces can be overlaid on the current display - useful as a reference trace when making adjustments to head-

end equipment or the network.

In satellite mode the storage facility also saves the LNB feed voltage setting, whether 22kHz is on or off, and the gain setting.

No need to think

This no-need-to-think feature is a big help when times are busy and one's brain already stretched. Although the instrument is calibrated for digital satellite signals only, Annie can be used on analogue satellite signals but you will have to deduct 4dB from the reading obtained, and to keep the analyser's complexity down, no analogue satellite demodulation is available. Terrestrial analogue signal level readings are always correct.

Using Annie is easy and becomes a delight once the controls are learned and the features described here are used to advantage. The instrument weighs in at just under 3.8kg with the battery installed and in the nylon carrying case.

The case is smart, has a carrying strap and a foldout hood for viewing in high ambient light and it is weatherproof. Fortunately the

A good companion for roof-top and street cabinet environments alike.



keypad is also splash proof and the case, made of polycarbonate reinforced with glass fibre, has proved to be rugged.

Re-chargeable battery life is 2 hours 30 minutes running continuously and a mains power unit and battery-charger is supplied. A lead for charging from a car-battery is also supplied, plus stereo headphones.

Annie comes with a comprehensive manual comprising 20 pages of clear instructions and information. In addition a laminated quick-start guide is included, useful for times when one's own memory

fails or where a particular situation rules out referral to the full manual.

Operation of this analyser is not at all daunting for the controls are completely user-friendly. Annie is innovative yet surprisingly free of gimmicky 'bells and whistles', a no-nonsense spectrum analyser that has proved to be ideal for the fool-proof alignment of receiving aerials and dishes and for speedy and accurate commissioning of distribution systems.

In summary: a good companion for roof-top and street cabinet environments alike.

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What a life!

Donald Bullock's servicing commentary

A package of histrionics / Fifty-three quid just for the hat / Old Tom Wainwright from Netherfield / Hay-bales every bit as magical as perry

“Ello, Mr Bullock,” whined Mr Trew as he shuffled through the door with his shambles of a wife. “We haven’t seen you for nearly three years, when you repaired our old Decca telly.”

“But you’ve got another television set now, have you?” I asked. They both nodded, and Mrs Trew’s dew-drop descended and rose.

The boys soon got their set onto the bench, and I saw that it was a 24” Toshiba 24W33B - which uses the 11AK37 chassis.

Paul soon found that it was stuck in standby, and as he reached for his screwdriver, the Trews started.

“We’re pensioners, mind,” he whined.

“And we ain’t made o’ money,” she added. I waved them out.

Paul soon found that the MC446080P40 IC was faulty, and the power transistor, the STP6NC60FP was short-circuited.

When he replaced them the power struck up but after a couple of seconds the EHT rose and crackled and it shut down again.

“Hm...” breathed Paul. “I’m a bit worried about the health of old Trew’s line transformer.”

He ran the set through its paces again and felt the transformer’s windings, but they remained cool, and he hesitantly turned his attention to the HT Regulation circuit.

Working on the basis that high value resistors (say over about 68k) are more accident prone than lower ones, he soon checked R817, and found it to be open-circuit instead of its nominal 130k ohm, and replacing it restored the HT line to its correct voltage.

“One IC and a resistor,” Paul said. “Not too bad. It’ll save a package of histrionics from the Trews, I suppose.”

“Don’t be so sure,” I said.

“Whiners whine whatever. Oh, here they are.” When they came in and settled themselves, Paul put the

squeeze on for £22.50.

“Oh, My God,” whined Trew. “What’ll we do?”

As he opened his bulging wallet she opened her purse to reveal a fat wad of folding money, and peeled off our piffling share, and together they departed, him whining, and her sniffing at her dewdrop.

Chirps like a canary

“This ‘un chirps like a canary,” piped Mr Moggie as he struggled in with a giant 28” Goodmans colour set.

It was a model W288NS, which uses the F16 chassis. “And that’s all he does. No good to me, he ain’t, not like this.”

Steven had a look at this one. It was dead all right, producing just a short chirp at switch-on, and nothing else - not even a lighted LED.

“If I were you, I’d get into the line circuit,” I said. “I bet the S2055N line transistor is the trouble.”

He tested it and found that it was slightly leaky, and fitted another, but the symptoms remained. He reached for the magnifier and studied the circuit.

“Ah - look at this!” he said. “One leg of C134, the 11nF 1600V line frequency capacitor, is surrounded by an almost invisible crack around the solder joint. It’s effectively disconnected from the print.”

Re-soldering the joint cured the trouble, and while he was at it, he re-soldered one or two other suspect joints.

At that, Greeneyes clopped in with our mugs of tea, and she handed me a nice little chocolate cake with mine. I soon scoffed it, and to my surprise she beamed me a sweet smile and handed me another.

“Er, I’m going to town this-afternoon,” she said.

“There’s a really lovely lettuce-green costume in Marks. It’s really just right to go with my deep-pink shoes.”

“But surely, you haven’t any deep-pink shoes,” I said. She smiled sweet-

ly and slid me another chocolate cake.

“They’re in Oliver’s,” she said.

“And do you know, they’re exactly the same colour as that green and pink fluted handbag in Cavendish House.”

“Cavendish House?” I wheezed.

“Have you been to Cavendish House?” She smiled.

“Had to,” she said. “They’ve got the hat that completes the outfit. Oh, it’s well worth the fifty-three pounds, I can tell you.”

“Fifty-three quid for that silly lot?” I asked.

She trilled with laughter. “No, silly,” she said. “Just for the hat.”

At that Mr McTurdey barged in with a 29” Sony CTV. His turned-down gumboots squelched as he walked.

“Ha, me bies,” he called. “Me telly’s dead and me screws is playin’ me up. It’s you bies who can help me.” I turned to Steven.

“The screws first, eh?” I said. “What can we do about his rheumatism?”

Steven bit his lip, then his face lit up. “Electrical therapy,” he said. “We’ll plug him into the mains.” I hesitated.

“He’s a big chap,” I said. “Think he’d draw a bit of current and run our bill up? It’s high enough now.”

McTurdey threw his head back and laughed. “Never mind me screws,” he said. “It’s the Sony I want yehs to fix.”

It was a model KVE2922U, which uses the AE1-C chassis, and sure enough it was dead.

Paul hooked the back off and found that the 4A mains fuse had suffered a violent death.

He homed in on Q602, the 2SD1548-LB line output transistor and found that it was dead short. After replacing these items, he studied the chassis, and, on instinct, examined C611, the 50V 47mF start-up capacitor.

It was both leaking and blackened, and seeing this he also replaced the TEA2260 chopper IC. His thoroughness paid off. When he tried the set, it

sprang into life, and when McTurvey collected it he bellowed his thanks.

"My camcorder's all jammed up, Mr Beezer," said Mr Scratcher as he plunged his hand under his pullover and frantically worked his fingers.

"Trouble is, I haven't got much money." I turned to Paul. "Good news and bad," I said.

Flimsy plastic cradle

His Hitachi camcorder had a cassette jammed inside. It was a model VM-E568LE, and while we could hear its motor turning, the carriage wouldn't eject.

As he left, still scratching at his livestock, Steven began to strip its mechanism down, and he found that its loading motor, which sits vertically to the left of the video heads, had popped out of its flimsy plastic cradle.

He re-fitted it and secured it with a fine cable tie, something that Sony might have done during its production, and it then worked perfectly.

"Schneider," bawled Mr Twopp as he banged in through the door.

"There's no Schneider here," I replied. "The Delicatessen is several miles along the road." And since that struck me a funny, I had a good and long laugh.

In fact, Twopp's Schneider was a 28" colour set, a model STV2802-T, and it was dead. I had a look at it, and found that its tiny button-sized rectifier block was utterly short-circuited. I replaced it with a far more substantial type, and it worked well.

Our next caller arrived in a modern van with darkened windows. It was John Berryman, the popular and outspoken undertaker from the next town. Six feet tall and broad with it, he looks more like a gentleman farmer than an undertaker, and he treats his job with an unusual, but refreshing frankness.

"Eh, Don, help us in with this set, will yuh?" he asked as he flung the van doors open. Inside, beside his giant Fidelity set, was a long, scruffy box with a lid.

"What's in there?" I asked, as we began to drag his set from the van.

"Oh, that's old Tom Wainwright, from Netherfield," he said. "Just collected him, I have. Popped off this-morning, after his breakfast, he did. Lovely old fellah. Did you know him? He must be very-near ninety."

"Let's get the set into the workshop, John," I said.

His Fidelity was a 32" Model CTV3228 - the first I'd seen for a while. As we got it onto the bench Steven appeared.

"How yuh keeping, Steve?" bawled

John. Steven smiled at him.

"Never mind the trade enquiries, John," he said. "Patience is a virtue, you know."

His set worked normally at first, then the picture began to shut down intermittently as it got warm.

The sound remained however, because, unusually, the audio stage is fed not from a line-derived voltage, but is a conventional HT line rectified from a chopper secondary winding.

Thermally defective

I soon found that there was plenty of HT about in the line stage, but there was no line drive, and this was because Q580, the 2SC1573A line drive transistor, was thermally defective. A replacement cured the trouble.

The morning had all but slipped by, and I noticed that the sun was shining brightly from a blue sky. Further, there was no wind at all.

It looked almost like a summer's day. I suppose that this was why I rode along happily with Steven's suggestion that I should do an outside service call into the surrounding countryside, towards the upper reaches of the river, in fact.

It was to an old customer, a local character called Guy Lambert, a huge and loaded local farmer, and one of the best. He had an ancient black and white console set, which he has consistently refused to renew, on the basis that he hardly watches television.

Over the years we'd managed to knock heater cathode shorts off the tube, and had ended up fitting a cathode ray tube isolation transformer.

I ought to explain, for the uninitiated, that in the case of the old monochrome valve sets, the valve heaters were lit by feeding an AC voltage first through a high-power mains voltage dropper, and then through the valves, in series.

Usually, between the last valve in the chain, and the chassis (earth) was the monochrome tube heater.

The tube came last in line, of course, so that its heater would suffer less impact from the mains at first switch-on.

In fact, the cathode of a valve, and a tube, come to that, consisted of a fine, barium-coated metal tube.

The heater was a long, thin loop of coiled filament resembling a slim hairpin, which slid into the cathode. Each heater was coated with an insulant to ensure its electrical separation from the cathode.

Loose molecular structure

When the heater chain was electrified, the heaters became red hot, and warmed the cathodes, with the result

that the barium, with its loose molecular structure, readily emitted electrons which were attracted by the anodes, so causing a one way current flow inside the glass envelope (hence the word valve).

Cathode ray tubes sometimes suffered from heater/cathode short-circuits, so that the cathode was effectively grounded by the heater chain, causing a brilliant white screen.

The answer was a new tube, but since they were very expensive, we used to try to remove the short circuit by tapping the tube neck to dislodge the offending swarf.

This often worked, at least for a few months, but if the short persisted, we used to remove the tube heater from the series-chain and re-wire it to an isolated voltage from a transformer, which we often screwed into the inside of the wooden cabinet.

All of this had been done with Guy's tube, but on the day I called, the tube's heater had blown and the tube had come to the end of the road.

I told Guy the sad news. "It'll cost you close on..." I began. But he waved me down.

"Now have a little drink with me," he said, and with an impish grin he beckoned me out to his cider tap room.

Standing around his giant cider press was a selection of seedy-looking china mugs, some without their handles, and all cracked and stained to a dozen shades of brown.

"Perry, this be, so watch out!" he said, and he filled each of the mugs.

I fully expected it to taste like fire and set my head exploding, for I've supped in many a farmer's tap room on my country calls, but it didn't! It tasted like nectar, and I wanted more.

Soon I had slipped out of myself to float way above Guy's farm, and I recall looking down on his cows and his roof, and upon the river as it slowly meandered by. But what did it matter? The day was all but over, and that brew was magical.

But when I saw several Guys, and when a row of his arms came up to fill my row of mugs again, I stayed them with my own row of arms.

"Guy," I said. "Don't think I'm funning to be tryful, or anything (hic) but one cup ish enough for now..."

"One cup?" boomed Guy. "You be all the same, you Townies. Here, 'ave a loll in the sun on these hay-bales, 'til you'm ready to get back 'ome again!"

And those hay-bales were every bit as magical as that perry.

FAULT REPORTS

TV and DVD Faults

Akura TPTV028WSSN
Amstrad DRX100
Amstrad DRX100
Amstrad DRX200
Beko 284248WNS
Bush 2138TSIL
Bush 21679NTX
Bush 2866NTX
Bush DVD141TV combo
Bush WS7673SII
Coby TV-DVD2150
Daewoo DTY2880
Daewoo model DF-4150/8150 DVDR
Daewoo model DS608P Digital STB
Decca D28NGH5 (G series)
Ferguson FTV32100 (Prof 8500 chassis)
Goodmans GTV211 TV
Goodmans GTV69W4SIL (11AK37 chassis)
Goodmans TV14T3DVD
Grundig ST70-725 (CUC6330) Chassis
Grundig TV Model MW-2700DPL/LF
Grundig W 82-2030
Hitachi C28W440N (Vestell 11AK33 chassis)
Hitachi C28WF560N (11AK45 chassis)
Hitachi C28WF560N (11AK45B5 chassis)
LG 20P30 TV/VCR Combination
Matsui 28DPL(CUC2040)
Matsui TV Model 1420T
Pace 2500B
Pace 2500S5
Pace 3000 Sky Plus
Pace 3100 Sky Plus
Pace BSKYB 1000 Mini box
Panasonic DVD/VCR combination
Panasonic Euro-2L
Panasonic model TC14S3R
Panasonic TX280TX1
Panasonic TX29AD2DP

Panasonic TX-32PM1
Panasonic TX-W28R4DP (Euro4 chassis)
Panasonic VCR/DVD Model NV-VP31EB
Philips 14PV503/07 Combination
Philips 21GR2550 (G90AE chassis)
Philips 25 PT4458/05 (L04E chassis)
Philips 28PW6006
Philips 28PW6517 (L01.1E)
Philips 32PW9523 (MD2.25)
Philips 32PW9534/05 TV MD2.25 chassis
Philips model 24PW6006/05 Chassis L01.1E
Sharp 32LF92H
Sharp DV740 DVD
Sony KP41DS1U.
Sony KV14V6U
Sony KV28LS60U

Sony KV29LS30U
Sony KVM 2151U
Sony KVX2572.
Sony VTXS750U
Sony VTXS760U
Tatung T25T395 TV
Tatung T32W250S
Thompson DSI4101
Thompson ICC17 Chassis
Thomson 28WF201G (ICC17 chassis)
Toshiba 50WT29B.
Toshiba TV Model 2103TB
Toshiba V231UK.
Wharfedale 350 Pal
Wharfedale M2126
Wharfedale TV Model M2126

Test Case 519 ■

John Parker ■ Michael Dranfield ■

Charles Arundel ■ Neil Baker ■

John Coombes ■ David Packham ■

Philip Salkeld ■ Bob Longhurst ■

Glyn Dickenson ■ Solution – Test Case 519 ■



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Switch position 1

Bandwidth DC to 10MHz
 Input resistance 1MΩ – i.e. oscilloscope i/p
 Input capacitance 40pF+oscilloscope capacitance
 Working voltage 600V DC or pk-pk AC

Switch position 2

Bandwidth DC to 150MHz
 Rise time 2.4ns
 Input resistance 10MΩ ±1% if oscilloscope i/p is 1MΩ
 Input capacitance 12pF if oscilloscope i/p is 20pF
 Compensation range 10-60pF
 Working voltage 600V DC or pk-pk AC

Switch position 'Ref'

Probe tip grounded via 9MΩ, scope i/p grounded



John Parker

Ferguson FTV32100 (Professional 8500 chassis).

This set was stuck in standby. I found the HT would not go above 30V. I could not find any short circuits or signs of overloads. I removed DP12 (SCR). This immediately got the set running with normal picture and sound. After much substitution of parts on the secondary side I found ZP2 (a surface mount 15V zener) to be faulty. It measured OK out of circuit.

Sony KVX2572.

When I switched this set on a loud bang occurred from the power supply and a six-inch flame appeared in the vicinity of C601 (0.022uF). After the flame extinguished itself, I found a direct short circuit across the reservoir capacitor. It was not the reservoir cap but C601 that shorted. Replacing C601 brought the set to life with normal sound and picture.

Sony KP41DS1U.

This projection set had what looked like red, blue, green flaring across the screen. Adjusting the G2 had no effect. Transistor Q701 (2SA10910) was leaky collector-to-emitter on the red tube base PCB. I have had this fault several times.

Toshiba 50WT98B.

This huge projection set had no picture. Sound was OK. TV picture was obtained on its SCART sockets when connected to another TV (as the monitor). Turning up the G2 showed a slight picture was present. Waveform and voltage checks around Q510 TA1316AN video IC showed it had normal video input with normal sandcastle and clock and data signals. The ABL line was at 6V, which seemed about right. It seemed that the video was blanked. Substituting a signal panel showed that the fault was possibly on the

deflection panel. Closer investigation around the frame IC Q301 showed that Q372 collector (a surface-mount transistor) was never soldered. Resoldering cured fault. However this was not the end of the story: the green gun started arcing. I had to replace the green gun and set it up.

Matsui 28DPL(CUC2040)

This TV was completely dead. Attending to the usual dry joints in the line stage I was rewarded with a set that started up then would shut down. Checking the supply lines showed they were present and correct. The line drive would come up then disappear. Checking the frame output showed it to be distorted. I found its 45V to be correct at pin 8, but its other supply at pin 4 was low at 16V. I found the frame IC to be leaky between pins 7 and 9 at about 82 ohms. Replacing the frame IC cured the fault.

Test Case 519

Over the years Cathode Ray has become something of an expert in satellite matters, particularly those pertaining to dishes, wiring and home installation of Sky equipment. All the staff are now standing by for what they hope will be a big rush for high-definition equipment this spring – not that the rewards from BSkyB itself are very great, but the spin-off in terms of sales of TV and cinema-sound equipment is well worth having.

Meanwhile Ray is teaching Todd, our man-on-wheels, to deal with Sky-related service calls. There were two such on this particular morning, and they went through them together before Todd set sail, hopefully forearmed with the necessary knowledge and equipment.

The first call was to Steve Hewson, an enthusiastic and impecunious character reminiscent of some of Donald Bullock's customers. He explained to Todd that he had acquired a refurbished Sky box for £50 and had hoped to make a similar saving on the cost of dish installation.

So he had fixed and aligned it himself, having borrowed a simple signal-strength meter from his brother-in-law, now resident in Spain. Steve's alignment procedure was simple in the extreme: get a rough positioning by visual reference to dishes on nearby houses, then 'home-in' to the satellite using the peaking meter. That he had done to his complete satisfaction.

The trouble was that there was no reception of Sky Television! With the box switched to the signal test screen, its readout of signal strength was very good at about 85%, but the signal quality bar-graph remained at zero. Switched back to normal operation, the screen showed a no-signal-received caption.

Todd trotted back to the van to fetch a spare Sky box, but it gave exactly the same results when hooked to Steve's dish, implicating his outdoor equipment. What was the cause of this problem? Todd soon had it sussed out, though it was the next day before the cure could be applied.

On, then, to the next one. Again this seemed to arise from a customer's DIY installation, though not this time of a dish; this gentleman had bought a new plasma screen from Colin at the shop, took it home and fixed it up himself. This seemed to have involved the dismantling and reassembly of his entire system, including a DVD player, VCR and Sky box.

The problem that had led him to call Todd out (on the strength of having bought the plasma screen from the shop!) concerned the operation of the upstairs TV; while it continued to provide Sky viewing, its remote control, relayed by a Global Eye extender, now failed to operate the satellite receiver, so that they had to go downstairs to change channels, and that would never do! Again Todd quickly found the cause of the trouble here. No repair or replacement of anything was required to restore normal operation. Could you have sorted this one out?

As he turned to leave, Todd looked at the Sky One picture displayed on the plasma screen – it looked somewhat woolly, quite different to the crisp and sharp images he was used to seeing on the same TV model in the showroom and workshop. He got from his van a certain something, fitted it and spent a few minutes thrashing zapper keys. The result was a much better picture.

What had he done? The solution is on Page 294.



Michael Dranfield

Bush DVD141TV combo

This 14-inch TV/DVD combo tripped out at switch on. I have had a lot of trouble with this type of frame chip in Daewoo sets that the Bush used, so my first check was a resistance reading on the 45V line-derived frame supply. There was a bi-directional reading of approximately 10 ohms across the 45V rectifier diode D403, and I immediately suspected the frame output chip, which turned out to be OK. After disconnecting various components, I came to the source of the 10 ohm short which turned out to be a small brown disc ceramic capacitor C413 (680pF) connected across D403 to snub out overshoots and protect the diode. I have had disc ceramic caps slightly Leakey before but never usually as low as 10 ohms.

Goodmans TV14T3DVD

The customer who brought this set in said it was only six months old but the shop had refused to take it back for repair as she had lost the receipt. It was dead, stuck in standby. On removing the back, the first thing I noticed was signs of excessive heating around the power supply chopper transistor. In fact even after a few minutes in standby, the chopper transistor's heatsink was too hot to touch. However the power supply was running OK so this was not the cause of the problem. Scope checks revealed the line transistor had a good base drive but was not conducting. It tested OK also, but a replacement brought the set on. Then I noticed the manufacturer's logo on the transistor was 'NEW' - obviously a very dodgy make, which got me thinking about the one in the power supply that was getting so hot. When removed, this also had the logo 'NEW.' Once I replaced this with a branded transistor, it ran very cool.

Grundig ST70-725 (CUC6330) Chassis

This set came in for frame collapse, caused by a dry joint on the frame scan coil socket. After doing some other joints I ran the set for a day and it was fine. I had the set running when the customer came to collect, but 20 minutes later, the customer rang up to say the set would not

come on when he got it back. He brought the set back to the shop and it powered up but had no sound or picture. I turned up the A1 control and I was expecting to see frame collapse but instead, the set displayed a blank un-modulated raster. A check around the micro revealed no activity on the SCL, SDA bus. Now I once had a peculiar fault on one of these sets - it was stuck in standby and the cause was a faulty infrared sensor. On his model it can be simply unplugged from the front. I did this and the set came on. When I removed the old three-pin sensor, it was found to have a 20-ohm reading between two of its pins. The sensor is of the same variety used in Tatung sets but with the Tatung only the remote stops working when the sensor goes faulty.

Hitachi C28W440N (Vestell 11AK33 chassis)

This set had a blipping power supply. Checks lead to a short circuit electrolytic capacitor C 1uF 250V - that is part of the standby thyristor circuit.

Mitsubishi black diamond BDS29S (Vestell 11AK19 PRO chassis)

This set worked but had vertically rolling on-screen graphics. Checks around the frame chip led to nothing and a sandcastle pulse was entering the micro on pin 19. The repair was for another dealer who was not in a rush so I put it to one side for a bit. Eventually another set came in and I was able to take comparison waveforms and voltages. I found that in the working set, the frame part of the sandcastle pulse was 1V, and in the faulty set it was only 0.5V. This led back to transistor Q420 whose DC bias at the base was insufficient to fully turn on the transistor. Now bias does not come from V_{cc} through a resistor, but from a clamp diode that rectifies the potted down line flyback pulse from the collector of the line output transistor, and this is where the trouble lay. Diode D602 (1N4148) was open circuit.

Sony KV28LS60U

This heavy TV was dead and flashing the error code for 'no vertical sync.' Now whoever thought

up the error codes on these sets got his sums wrong. The cause was nothing to do with the frame output, but was in fact an open circuit primary winding on one of the line driver transformers (T8802), and as the frame supply is line derived no line operation throws up a frame error, so beware!

Sony VTXS750U

This box had been struck by lightning and came in tripping. While making some measurements in the power supply, the box came on but displayed 'no sat signal received.' I decided to replace the LNB control chip IC500 (LNBP11SP) as I have had this faulty a few times, but it made no difference. A check on pin 5 of the LNB enable pin - I should have done this in the first place - revealed that this was only 0.63V. It should be 5V to switch the LNB on. This comes from pin 66 of IC605 (TL16C552APN), used as a port expander for the micro. Pin 66 had a bi-directional reading of only 8 ohms to ground and was also found to be very hot. A replacement cured the fault and no other damage had been done.

Sony VTXS760U

Before delving too deeply into a box stuck in standby, check C819 (2200uF) in the power supply. You may find it has dried up.

Tatung T32W250S

This set was dead. The cause was a dry joint on the line scan coil socket. However this is more likely to cause damage in the line drive department than to the line output transistor. In this set, as with most with this fault, a surface mounted diode was leaky in the line drive circuit DL15 (PRLL5158). It had a low reverse reading. Take care when testing, as this is a schottky diode with a very low forward reading anyway.

Sony KV29LS30U

This 29-inch set came in dead with the standby LED blinking an error code. It turned out that the line transistor (BU2515DX) was short circuit and the line transformer had shorted turns - not uncommon with the grey transformer. When these



had been replaced the set now came on, but with a very small picture in the middle of the screen. Also it was very bright, with flyback lines and incorrect RGB drives - all classic symptoms of a crashed EEPROM. However I e-mailed a friend of mine, Nigel Goodwin, who works for a big Sony dealership and he said this is a common fault on 4/3 sets using this chassis and the cause was not the EEPROM. Instead he advised to change the micro combined jungle chip IC001 (TDA9394H-N1-5-0423), an 80-pin SMD chip. When it came, the one supplied had a different mask ROM number, but after fitting, the set came on OK and required no setting up apart from tuning in the TV channels.

Thompson ICC17 Chassis

The customer complained of lines down the left hand side of the screen. This turned out to be striations, a fault that used to be very common on TV sets 20 years ago, but a fault I cannot remember when I last saw. The line linearity-damping resistor RL26 (1k ohm) was dry jointed and looked like it had been getting very hot. When it was touched it disintegrated.

Wharfedale M2126

This set had only 70V on the HT rail and no line drive. I connected a 100W bulb across the HT rail and switched on. Now the HT rail was only 50V but up came the line drive waveform and the frame stage was heard to be running. The culprit turned out to be the HT rail smoothing electrolytic C641 100uF, which was open circuit. This surprised me, as the set was so new.

Neil Baker

Grundig W 82-2030

The fault was ragged verticals and an over-bright picture. The cause turned out to be two Electrolytics C606 10uF 250V and C605 47uF 160V. Replacing these cured the fault.

Wharfedale 350 Pal

This set was dead with both the set fuse and the mains plug fuses blown.

There are four capacitors across the bridge C502/3/4/5/ value 102k. One of these was blown apart, along with the bridge rectifier D506 short circuit.

Philips 28PW6006

Field collapse was reported on the job card and sure enough, a thin white line was present before the TV shut down to standby. All was well when the frame output IC TDA8359J was replaced along with a safety resistor down by the line output transformer R3488 4.7 ohm safety resistor.

Philips 21GR2550 (G90AE chassis)

Ragged verticals and a very dark picture for 10 minutes was the report before the TV was watchable. It was found an electrolytic C2580, which was a 470uF 16V was very low in value. I also replaced C 2843 220uF close by for good measure, as this also had poor ESR

John Coombes

Panasonic model TC14S3R.

Color lines on picture. If looking at the color lines on picture which is negative like it is set on a different system NTSC or SECAM. This fault can be traced to eeprom IC1205 (ST24C0ZAB1).

Philips model 24PW6006/05 Chassis L01.1E.

Dead
If the set is dead and there is no red LED, check the diode D6560 (BYV29-500) for short circuit. This may give a loud ticking sound from the power supply to give an indication as to where to look for the fault.

David Packham

Coby TV-DVD2150

I do not know where this one came from but the thing was dead with the mains fuse shattered. It turns out the power supply uses discrete components and is similar to the infamous Onwa circuit and the same parts were faulty. Q501, 503 (2SC1815) and Q502 (2SB774), ZD501 (8.2V), ZD501 (9.1V), C507

(33nF), C508, 509 (47uF 63V), R503 (1R 3W), R502 (4R7 5W), R508 (10K), R509 (330R), D511 (BYT52) and last but not least the chopper transistor Q504 (BUH517) completed the repair.

Daewoo DTY2880

When I reached this customer's house the set was dead with the mains fuse o/c. I fitted a replacement, put my fingers in my ears, shut my eyes and switched on. Sure enough the power control IC, an STR-F6653, blew itself apart. I replaced it. The emitter resistor and the fuse then followed the same procedure to be rewarded with EHT, sound and picture. Wonderful!

LG 20P30 TV/VCR Combination

White streaks on playback which varied when the aerial lead was moved or unplugged was the complaint with this set, which lived in a primary school and was needed for a lesson that afternoon. The fault was simple - the video head earth connection did not connect, but the amount of disassembling and rebuilding was a real pain. Still it kept the teachers happy and I got another job out of it.

Sharp 32LF92H (Vestell 11AK45B)

The power supply on this TV, which is fitted with the Vestell 11AK45B chassis, had gone into self-destruct mode. Besides the chopper mosfet (Q102) which had a hole in it, I had to replace the control IC (MC44608), the opto-coupler (IC 100), D104/5 (BA159), C111 (220pf) and the 2A AC fuse. A check on the diodes on the secondary side of the chopper transformer and the line output transistor proved that they were OK so it was time to switch on and a picture and sound appeared.

Philips 32PW9523 (MD2.25)

This set was tripping with the LED flashing. Checks in the line output stage proved that C2418 (220pf 2kV) across the line output transistor was short circuit. I fitted a replacement and switched on to be rewarded with a surge of EHT before the LED started flashing again. Further tests led me to transistor 7478, which is a mosfet transistor on the same



heatsink as the line transistor and was short circuit. I used a BUZ90AF, which worked a treat.

Akura TPTV028WSSN

The customer said that this TV was making a ticking sound and would not come on. The power supply was tripping of course. The line output transistor measured ok as did the line output transformer. The fault was traced to CD27 (2n2 2kV), which was short circuit. On switch on the set fired up but the picture was offset, (as if the line phase was maladjusted), dry joints were responsible as a tap on the line output transistor heatsink proved. A blanket re-solder of the line output stage provided a cure.

Bush 21679NTX

This set was dead with no standby light. "Simple," I hear you say, and I did exactly as you would have done and headed directly for the electrolytics in the power supply primary. Sure enough the 47uF 63V coupling capacitor had a high ESR. Replacing this had no effect however, but I noticed that when the set was switched off, the 320V on the collector of the chopper transistor decayed rather quickly. Yes you're right, the smoothing capacitor was open circuit and a replacement (100uF 400V) set matters right.

Bush 2138TSIL

I arrived at the house to be confronted by this TV, which was dead. The mains fuse was open circuit so I disconnected the degaussing coils, replaced the fuse and switched on. The set burst into life and I was rewarded with a beautiful picture, not necessarily the right colours mind, but a picture nevertheless. A replacement positor (resistor with positive temperature coefficient) restored everything to normal and the customer crossed my palm with silver.

Sony KVM 2151U

When I got to this house the lady said that the sound and picture went off after the set had been on for a while and her neighbour, who knows about these things, thought it might be the picture valve. Anyway when I

got the back off, disturbance testing (a smart tap with the handle of a screwdriver) sent the set snowy etc. and proved that there was a dry joint on the motherboard. I eventually traced the fault to L501, the AFC tank coil that was dry jointed.

Bush 2866NTX

This set was dead with no standby light. The mains fuse was intact and there was 330V at the collector of the chopper transistor. I started by checking the electrolytic caps in the power supply primary and found that C112 (47uF 35V) had a high ESR. A replacement made no difference however, and I found R103, a 47k resistor, was open circuit. Replacing this brought the set to life and I was rewarded with a wisp of smoke as the safety resistor for the audio stage died. I don't know why but the audio output chip (TDA2616Q) had gone short circuit.

Decca D28NGH5 (G series)

Dead and tripping was the fault. A s/c line output transistor was the cause, and the reason it was short circuit was the transformer and the line scan coil plug had both desoldered themselves. A new transistor and a good re-solder produced a good picture.

Panasonic TX29AD2DP

The customer complained of a loud crack when the set was switched on, which was caused by a dry joint on D544 in the line stage. The other fault (not reported) was East West distortion that was cured by going into the service mode and adjusting the width and E/W controls. To get into Service mode; Bass on max, Treble on min, press 'F' on the set then volume - on the set while pressing reveal on the remote. Pressing 'N' gets you back out.

Philip Salkeld

Panasonic TX28DTX1

This in-warranty set came in stuck on standby. There were no rail voltages present. A phone call to Panasonic Technical was most helpful. He advised me to re-solder the chopper transformer, line output

transformer, tube base and finally connectors G1, G2, G3 and G4, which connect 'G' board to the mother board. I did this, re-soldering at the same time which brought the set back to a working condition. Panasonic is using-lead free solder, which does not impress me.

Hitachi C28WF560N (11AK45B5 chassis)

This set came in with a narrow picture down the middle. It did not take long to notice that R613 33 ohm 2W resistor in the east/west circuit had burnt out. I checked most of the components in this stage C623, C624, C622 and D611, all proving correct. Nothing for it but to replace R613 and switch on. The outcome of this was that the scan coils started to arc. Looking at the tube label you may have guessed: a Philips/LG W66ERF022X0133, another in-warranty request to apply for.

Philips 25 PT4458/05 (L04E chassis)

This in-warranty set came in totally dead. Straight to the power supply. Cold checks brought me to 3532 4.7 ohm 0.5W, which had a crack in it. Looking further brought me to the two control ICs, 7511 TEA1506T and 7531 TEA1620P, which were both damaged. Checking again, 6536 SB180 diode was short circuit. I always replace the opto-coupler in Philips power supplies 7513 and then hope for the best. Fortunately it restored the set back to working condition.

3532 P/No 4822 05210478
7511 P/No 9352 72043118
7531 P/No 9352 73952112
6536 P/No 9322 18825673
7513 P/No 8238 27402070

Beko 284248WNS

The customer complained that the picture went off but the sound stayed on. The field engineer was lucky - the fault was on when he arrived. There was no brightness - obviously a line drive problem. He soldered the line stage thoroughly and when tried, the set worked. However a few days later another call was in. Eventually the set was brought into the workshop. The fault was temperamental but tapping around the line driver transformer sometimes brought it back on. I replaced TR501 from a



scrap set. This brought a conclusion to the fault.

Goodmans GTV69W4SIL (11AK37 chassis)

The customer reported that the colour was 'not right' - not much help. The set was put on the soak test. When it went faulty the grey scale turned purple indicating that the green output had dropped out. When the back was removed I noticed that the tube was a Philips, but when the tube neck was tapped there were no green flashes like there generally are. I replaced the TDA6108JF on the tube base but the fault was still there. Applying the scope on the green cathode showed activity. No other option but to replace the CRT W66ECK001X13, which proved to be the fault after a long soak test.

Goodmans GTV69W4SIL (11AK37 chassis)

The fault on this set was that the picture had moved across to the right leaving a black straight line down the left hand side. Going into the service menu and selecting horizontal position had no effect. This proved that it was a hardware problem. After checking a number of components in the line stage, I eventually came across R683 2.2k ohm 0.5W open circuit - it is next to L602. Of all the Vestell models this one seems to give the most obscure faults.

Panasonic TX-32PM1

This set came in dead. The standby light would come on and then start blinking. With these models in the past I have had dry joints on the wire connectors that link the two panels together. Only this time it was not the problem. A phone call to Technical provided the answer - replace Q850 2SA1668LF603 in the secondary of the power supply, which restored a fully operational set.

Thomson 28WF2016 (ICC17 chassis)

The customer complained that when he was watching Sky, part of the words at the bottom of the screen were missing. For example on Sky Sports News, when the latest news is running along, the words were being clipped. All that was required was to reduce the height slightly, but how do you get into the service menu? Good question. To enter service

menu: Television into standby, switch off with on/off switch. Vol-prog-pushed in together on front of TV. Switch on, press exit button, then customer menu button. Go into preference option, select format, set to 16:9. Press exit button then press blue Fastext button. This will bring you back to service mode. Go into geometry and adjust height. Then come down to store, press OK, and then set into standby to store. Once you get started, it is quite easy.

Panasonic TX-W28R4DP (Euro4 chassis)

This set came in virtually dead. When you switched it on, the standby light appeared and using the channel up/down button on the front of the set continuously, a mosaic coloured raster appeared. This indicated a frame fault. A cold check on the frame LA7845N IC451 revealed nothing out of the ordinary. Tracing the LT rail from pin1 to the line output transformer brought me to D558 1SR124-4AT82 m was short circuit and R559 0.33 ohm safety resistor part No. ERQ12HKR33 open circuit. Replacing these two items corrected the standby problem.

Hitachi C28WF560N (11AK45 chassis)

It is amazing how a dry joint can cause so much bother. The set belonged to a relative, so I went one night to watch it to see if I could see the fault. He complained of no picture but the sound stayed on. During my stay it worked faultlessly, so I then made arrangements with him to give me a call when the fault developed. A week later, about 9pm, he rang to say there was no picture. I dashed around and sure enough he was right. While removing the back, the picture appeared. IC600, the field output chip, was dry jointed blanking out the CRT.

Bob Longhurst

Tatung T25T395 TV

The fault was only present from 'cold' switch-on. The sound was present with a blank raster, which had some six lines across it at the top. After a few minutes a picture would gradually appear in sections across the screen. The effect was like a black curtain drawn across the central area of the

screen, which slowly reduced in size as the picture filled the whole screen. No amount of freezing or heating would give clues to the faulty component. Finally a 'junior moment' of recollection that this fault was similar to Philips 3A chassis, I think it was, where the field boost capacitor was the cause. In this case that capacitor is C2415. It was completely open circuit! Once replaced, all was fine.

Bush WS7673SII (11AK19 chassis) TV

I had repaired this TV a few weeks previously, when loss of all video with just a blank raster, if the A1 voltage was increased, necessitated the replacement of the TDA6108JF on the CRT PCB/socket assembly. It was returned with the same IC at fault, so I decided to contact Bush Technical, where the ever-helpful 'Victor', is always ready to solve fault problems. The actual CRT PCB (it was a very small rectangular one with one corner cut off diagonally) is the cause of the fault. Because the spacing between the base socket pins is very close, inter-pin capacitance can cause a discharge effect, which damages the IC. I was able to obtain very cheaply, the improved PCB/socket assembly from Charles Hyde. Their order code is ALB1614. Apart from being larger, the new PCB has slots drilled between all the socket's pins to prevent flashovers, etc, and sockets fitted which have to be removed to accommodate the 'hard-wiring' to the main PCB. The only wires that have to be swapped around are those in the four-wire ribbon cable, which carry the 200V and heaters supplies, etc. The six-way ribbon cable can be soldered in place of the removed socket, in the same order as they are removed from the old PCB's holes. This is a modification well worth doing if the TDA6108JF has failed.

Goodmans GTV211 TV

Dead with a very quiet rapid ticking noise coming from the power supply was the fault. My initial checks for a short circuit line output transistor, etc., drew a blank. Suspecting a short circuit secondary diode, etc., I checked them all in circuit to no avail, so decided to de-solder them one at a time to see if this stopped the 'tripping' effect. Then inspiration



struck! Check the main HT across C5, the smoothing capacitor. It was only 220V, because it was totally open circuit. A nice new 100mF 400V replacement was fitted, which solved this problem.

Philips 32PW9534/05 TV MD2.25 chassis

The initial fault was that the TV would go off to stand-by after some two hours of use. If left to cool down it would then work again. I was called in when it went off one day and stayed off. The line output transistor had been destroyed through dry jointed pins on the line driver transformer pins. Fairly straightforward I thought. However, at switch-on, all that happened was that the red LED flashed with the TV refusing to come on out of stand-by. To proceed with this secondary fault meant locating the 'service socket' S89 near the microprocessor. To enter the Service Default Mode short pins 1 to 2 (there is an explanatory diagram printed on the PCB itself). The TV was then switched on as normal and worked perfectly. At this point, while the TV is operating, change the shorted pins to 2 and 3. In this mode error codes will be displayed. In my case it showed errors 44 and 47 among other numbers, which confirmed the FET circuit ref. 7470, an IRF620F1, had expired. It is necessary to empty the 'Error Buffer' of the current fault codes once the repair is completed. In my case a new FET sorted this little problem. Phew!

Sony KV14V6U

When first powered on, the EHT would just rustle-up then die with the TV reverting to stand-by and the red led flashing in cycles of two. In this case the cause was a faulty line output transformer. All was well once replaced.

Toshiba TV Model 2103TB

I had collected this 'dead' TV because in the customer's home, I had found the cause was a short circuit across the line output transistor. Bench tests confirmed the line output transformer was the culprit. It was duly replaced, the TV was 'bench-tested' and I returned it. This particular customer was on the perimeter of my territory, so the 'job' involved a fair amount of

driving. I mention this because as I was about to depart, cheque in hand, the customer pressed the remote's stand-by button, which switched off the picture to a blank blue raster, and NOT the whole thing to stand-by. Quietly cursing my luck, I suggested the best option was for me to return with what I suspected was the faulty part, and replace it at extra charge. The 'stand-by' switching involved some four transistors, although Q803 looked the most likely cause of the fault. Upon returning I checked Q803 in circuit. It was definitely showing shorts across all its junctions. Thankfully this proved to be the case, and once a new 2SC2023 had been fitted, a perfect 'stand-by' was achieved. And the moral of this story is: always check the stand-by function works!

Philips 14PW503/07 Combination

It was dead, but very quietly tripping. Having ascertained that it wasn't a line output short circuit, etc., my tests led me to short circuit diode 6391. When replaced with a BYW98-200, full working order was restored.

Sanyo Model CE28WN5-B TV (EB6-A28 chassis)

More often than not, when first switched on, the picture would twitch with variations in picture height, etc. Upon investigation the connections of the field output IC were very poor, and looked to be the cause of the fault. However, once soldered, plus a few more in the same area for good luck, the fault persisted. Pretty well anywhere I tapped and prodded, the fault could be cured or instigated.

Frustration began to set in. The 'very touchy' area was eventually localised to regulator IC642. This was the cause of the fault. Once its connections and adjacent regulator IC641 connections were also re-soldered, I was rewarded with a stable picture.

Wharfedale TV Model M2126

This one displayed a blank blue screen with the word 'KEY' and three dashes. It was asking for the customers PIN code. If forgotten, do not worry. Press the 'PP' button three times, and then all will be fine.

Grundig TV Model MW-2700DPL/LF (CUC2059 chassis)

When powered-on, there was just a quick 'blob' of a picture in the centre of the screen before reverting to stand-by. As it was situated in a first floor flat and was a bit of a brute, and only a kindly 70 year-old lady to help me get it down the stairs, I decided to make a show of knowing what was the cause of the fault. Off came the back, out slid the chassis, and Eureka! The pins of the field output IC were all pretty well open circuit, due to dry joints. I re-soldered them, and anything else that looked dubious, as this was a one-shot attempt at success. Lo and behold the beast burst into life. One very happy old lady and a very chuffed me. I don't know how the old dear would have got it down the stairs if I had failed.

Matsui TV Model 1420T

Although totally dead, there was a nice 320V across the main smoothing capacitor. Time to investigate the start-up circuitry: R510, a nasty little 1M5 was the culprit. A better quality, metal oxide replacement restored life.

Glyn Dickinson

Philips 28PW6517 (L01.1E)

Clicking on and off was the complaint here. There was a vague burning smell coming from the CRT base where a small disc component was getting hot. This isn't a capacitor – it's a thermistor between aquadag and true earths to provide a reference potential. It's also a red herring as the fault is due to the line output transformer. The HR replacement is HR7057. Amazingly for a Philips, the set worked fine after replacement with no other damage.

Panasonic Euro-2L

If one of these arrives with a short-circuit line output transistor, remove the metal screening plate under the digital section and resolder the lugs from the top can. This will prevent the fault recurring. Incidentally, the digital processing IC which causes all sorts of faults and used to come as a kit is now obsolete.

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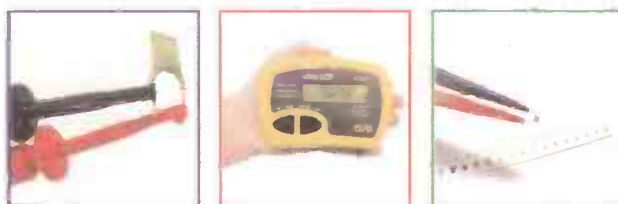
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Touching the void with Final Cut

Darlow Smithson Productions is one of the UK's leading independent production houses producing high quality factual programmes for broadcasters across the globe. Within the industry it is renowned for employing the best creative talent. The creative team has a particularly strong focus on ambitious docu-dramas and theatrical documentaries.

Darlow Smithson Productions' work includes the award winning 'Touching the Void' - the true story of two climbers and their perilous journey up the west face of Siula Grande in the Peruvian Andes in 1985.

Touching the Void was Darlow Smithson's first production to be cut and edited using Apple's Final Cut Pro software.

The brief for Touching the Void required a solution able to cope with multi-platform formats from DV to fully compressed HD.

After considering many alternative applications, the production team chose Final Cut Pro due to its range of capabilities and cutting edge editing functionality.

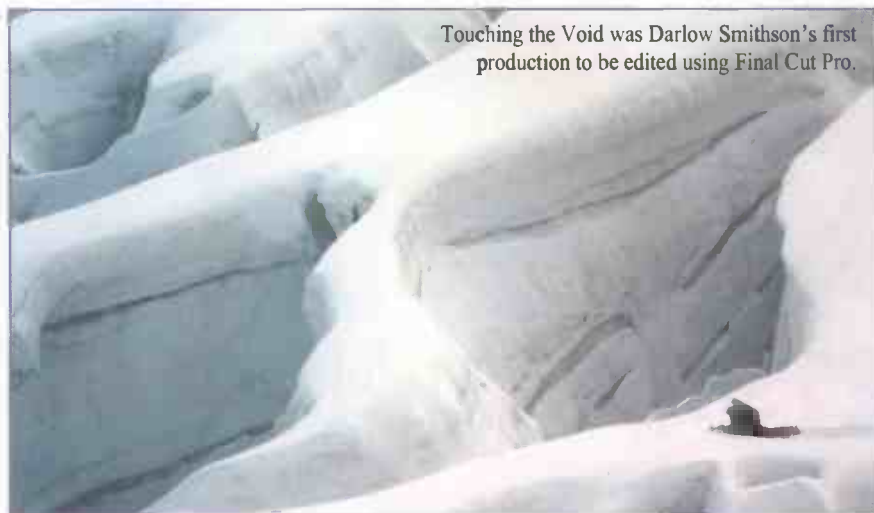
From editing to output, Final Cut Pro includes advanced image processing and intuitive media management features.

The software runs on dual processor Power Mac G5 machines, which offer rendering capabilities and the power to edit video.

Dan Carew-Jones, head of Post Production at Darlow Smithson, says: "Final Cut Pro was extremely attractive to us as a cutting tool and we needed a system that was going to be cost effective.

"As we were already working on Mac hardware it seemed that the move to Final Cut Pro was the obvious choice.

"We have found it to be a very stable solution and subsequently took



Touching the Void was Darlow Smithson's first production to be edited using Final Cut Pro.

the decision to base all of our in house post production around Final Cut Pro."

Darlow Smithson's head of Production, Ulla Spreib, added: "The main reason we use Final Cut Pro is simply because it offers seamless integration with our systems and poses no compatibility issues.

"Cutting in-house also immediately reduced costs by eliminating transportation, courier and travel time, but we also achieved greater creativity as our directors spent more time on the edit."

Touching the Void is considered by film critics as one of the UK's most successful theatrical documentaries ever to be made and has been a massive success for Darlow Smithson.

The film has already won the

British Academy award for outstanding British Film of the Year, Best Film at The Evening Standard British Film Awards, as well as Best Documentary and Best Technological Achievement at the British Independent Film Awards.

Touching the Void also won a further eight awards at the International Mountain and Adventure Film festivals.

Seconds from Disaster

Darlow Smithson is now running eight Final Cut Pro editing suites in-house producing programmes such as Seconds from Disaster, a documentary examining some of mankind's biggest disasters that will be shown on the National Geographic channel.

Further productions include The Blitz, which has been produced for Channel 4 and Channel 4 International and is a one-off, two-hour documentary charting London's worst wartime night.

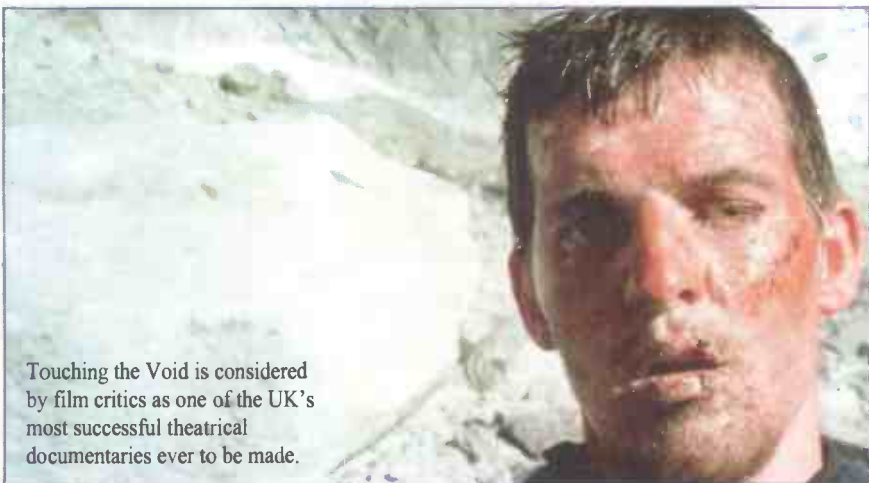
Darlow Smithson produces a large volume of graphic content in its work and spends close to one million pounds per year outsourcing this to specialist graphic companies.

The company is currently trialling Apple's Motion 2 software solution for title sequences and 2D graphic work, anticipating a much broader in-house service offering in the future.

Motion 2 offers true film quality



Darlow Smithson is currently trialling Apple's Motion 2 software.



Touching the Void is considered by film critics as one of the UK's most successful theatrical documentaries ever to be made.

outputs that can be seamlessly integrated into video. Darlow Smithson foresees Motion 2 making a great impact on the production process and is actively promoting the application to its creative talent.

At the heart of Final Cut Studio is Final Cut Pro 5 for professional editors working in DV, SD, film, or all major HD formats including HDV, DVCPRO HD and fully uncompressed HD.

Native HDV (long GOP MPEG-2) support in Final Cut Pro 5 enables users to edit camera native HDV without generation loss. Powerful new multicam tools let editors cut from up to 128 sources, with simultaneous real-time playback of up to 16 angles at a time.

A new IMX codec in Final Cut Pro 5 allows for native editing of broadcast content from Sony's XDCAM.

Direct support for Panasonic's P2 solid state media gives editors a high-speed solution for tapeless transfer of DVCPRO, DVCPRO50 and DVCPRO HD video.

New Dynamic RT, an intelligent system that automatically adjusts image quality and frame-rate during playback, allows editors to see more real-time effects at the highest

possible quality.

Additionally, the RT Extreme engine in Final Cut Pro 5 has been enhanced to allow uncompressed HD effects to be viewed in real-time.

24-channel audio capture

New audio capabilities in Final Cut Pro 5 enable users to capture up to 24 simultaneous audio channels at high-quality 24-bit 96kHz and use audio control surfaces.

Soundtrack Pro, a new audio editing and sound design application included in Final Cut Studio, features a waveform editor with flexible Action Layers that allow users to instantly re-order, bypass or change any edit, effect or process.

Intelligent Find-and-Fix features quickly identify and repair common audio problems. An integrated multitrack mixer allows editors to apply common effects to multiple tracks and group common tracks using busses.

With over 50 professional plug-ins including Space Designer, Match EQ and Linear Phase EQ, Soundtrack Pro provides a powerful set of tools to sculpt the sound for production.

Soundtrack Pro comes with over 5,000 Apple Loops. AppleScript capabilities built into Soundtrack Pro simplify and accelerate the video production process by automating common and repetitive audio tasks.

Motion 2, Apple's real-time motion graphics software, enables Final Cut Pro editors to add motion graphics to their projects, whether they are working in DV, SD, HD or film.

Motion 2 is the world's first motion graphics software with GPU accelerated 32-bit float rendering for true film quality output.

Replicator, a new automated design tool, lets editors animate duplicated movies or graphics along user defined grids and patterns. Motion 2 also includes over 130 accelerated filters such as 3D rotation, vignette and caustics, and more than 50 new particle effects that automatically generate spectacular animations like sparkles, bubbles and space clouds.

In addition, third party developers can write their own effects with FxPlug, a professional plug-in format that takes full advantage of Motion 2's real-time GPU accelerated performance and 32-bit float rendering.

New MIDI support allows Motion 2 to be "played" like a musical instrument with animation changes triggered by playing a keyboard or using faders or knobs on a MIDI controller.

DVD Studio Pro 4 is claimed to be the first commercially available DVD authoring software that lets users burn their HD projects to high definition DVDs. It also includes support for mixed formats.

Darlow Smithson produces a large volume of graphic content.



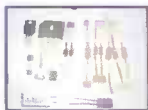
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			1352.5037 DLOT2184	£16.00	3313110LOT2238	£15.00	THOMSON		
			1362.5001LOT2262	£15.00	58.834LOT2238	£15.00	105009.8LOT1505	£19.00
			1362.5001 ALOT2262	£15.00	M 12-130LOT2238	£15.00	10500980LOT1505	£19.00
			1362.5002LOT2262	£15.00	M 12-133LOT2238	£15.00	10500980.P1LOT1505	£19.00
			1362.5002 ALOT2262	£15.00	M 12-138LOT2238	£15.00	10531460LOT1505	£19.00
			1372.0052LOT2262	£15.00	M 12-157LOT2238	£15.00	105660.6LOT1505	£19.00
			1372.0052 ALOT2262	£15.00	M12130LOT2238	£15.00	10566060LOT1505	£19.00
			1372.0052 BLOT2262	£15.00	M12133LOT2238	£15.00	10566060.P2LOT1505	£19.00
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2962205312	RC160HL	RM521V59401	RC737HL	RC6513	RC437/HL	KVM2170D	RC523/HL	RM811(NOPIP)	RC523/HL
2962205313	RC160HL	RM531V59403	RC737HL	RC6941/01	RC443/HL	KVM2171D	RC523/HL	RM816	RC522HL
2962205315	RC160HL	RM541V59202	RC737HL	RC694101	RC443/HL	KVS2951	RC523/HL	RM817	RC522HL
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2962205372	RC160HL	RM551V59502	RC737HL	RC7500	RC437/HL	RM640	RC522HL	RM838	RC522HL
2962205373	RC160HL	RM551V59503	RC737HL	RC7502	RC437/HL	RM641	RC522HL	RM842	RC523/HL
2962205375	RC160HL	RM561V59601	RC737HL	RC7503	RC437/HL	RM641A	RC522HL	RM846	RC523/HL
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2962205821	RC160HL	RM651V59506	RC737HL	RC7535/01	RC443/HL	RM649	RC522HL	RMK1T	RC522HL
2962205906	RC160HL	RM76151V65801	RC737HL	RH6622/01	RC437/HL	RM650	RC522HL		
29622516	RC160HL	RM76151V67902	RC737HL	RH662201	RC437/HL	RM651	RC522HL		
E72911DPL	RC160HL	RMM6050V57802	RC737HL	RH6820/01	RC437/HL	RM652	RC522HL		
				RH682001	RC437/HL	RM654	RC522HL		
				RP420	RC437/HL	RM655	RC522HL		
				RT230	RC437/HL	RM657	RC522HL		
						RM658	RC522HL		
J.V.G.		PHILIPS							
RMC663	RC665HL	PT150A	RC437/HL						
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Miscellaneous

Ekco U29 small table set

The Ekco U29 is better described as a small table set rather than a midget because although modest in outside dimensions, inside it has a chassis that is little smaller than a conventional table model and is exceedingly well put together. Chas Miller reports.

A 'short' superhet for AC/DC mains, the Ekco U29 was originally released in June 1946. It is totally inconceivable that anyone at the time could have anticipated that it could offer excellent performance nearly sixty years later, for that is exactly what our particular example did after a commendably small amount of necessary repair work had been carried out.

Externally this set looked very clean and tidy. It was not too bad inside either but there was evidence of previous repair work having been carried out many years ago, some more recently.

In the first category was the replacement HT smoothing choke of



Radiospares manufacture and evidently an 'exact replacement' type because it was equipped with the two lugs on its shell to which the HT fuse panel is bolted.

We would guess that this dates from not less than forty years ago. The recent work was the replacement of the original mains filter condensers by two unsuitable modern types, one of which was non-connected to a solder tag by as fine an example of a 'dry' joint as one might meet in a month of Sundays.

Not being attracted by the use of 250V DC working condensers at mains voltages, we removed them



and fitted in their place a couple with a more reassuring 1kV rating.

In the U29 we have an excellent example of how Messrs. EK Cole took great care in mains filters in AC/DC receivers by using close-coupled RF chokes designed mutually to cancel out noise.

The valve line-up of the U29, according to the Trader service sheet, consisted of a CCH35 frequency-changer, EF39 IF amplifier, Pen453DD double-diode output pentode and CY31 half-wave rectifier.

However, in this example and in

Above: The front of the Ekco U29.

Left: The look of the mains filter did not inspire confidence.

all the others we can remember servicing, the DDP is a CBL31. The two types differ considerably in characteristics, particularly in respect of grid bias voltage and optimum anode load and are not directly interchangeable.

Bias grid error

It should also be recorded that there is an error in the Trader circuit diagram regarding the bias on the grid of the DDP, whichever type might be fitted, that needs to be corrected before a discussion of our work on this set may be carried out.

In fact, this is no bad thing as a thorough understanding of how the DDP works in a short superhet is essential for servicing purposes and this gives us the opportunity for a detailed description.

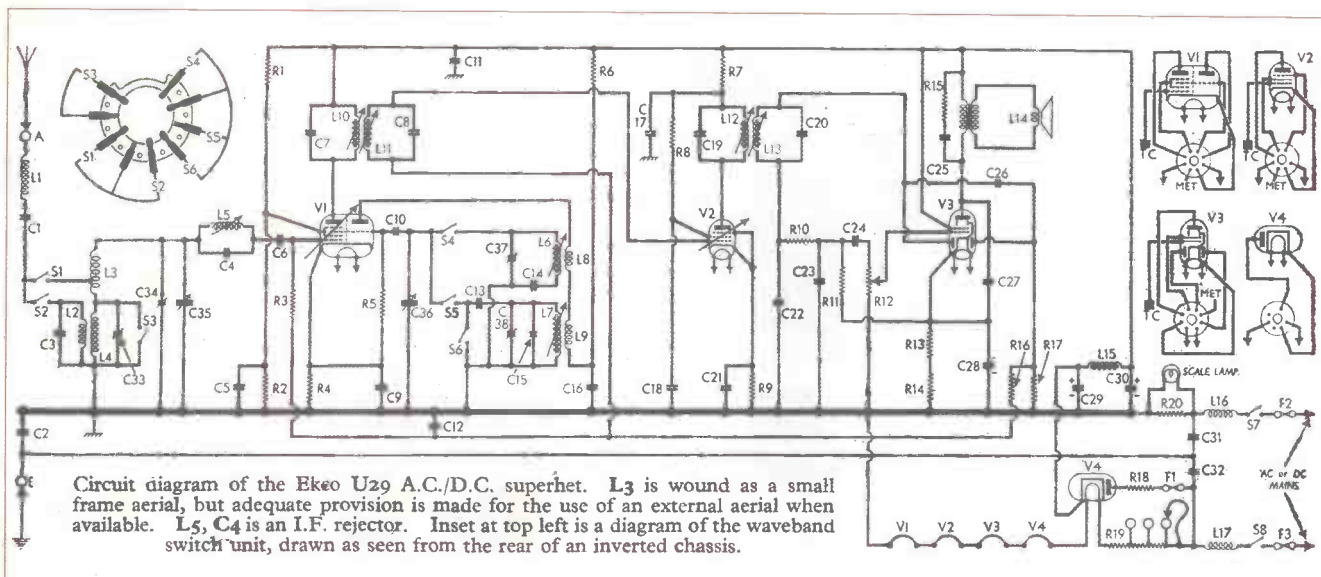
In order to obtain sufficient AF input to load fully the output pentode a high degree of AVC delay has to be employed. This is obtained by raising the cathode voltage to a considerably higher potential than is necessary for grid bias purposes, by inserting another resistor in series with that used for the latter.

The values used in the U29 are entirely typical at 150Ω for grid bias with an extra 330Ω for the AVC delay bias.

Now, a situation arises in which three different electrodes in the output valve have to receive different bias voltages: the maximum available for the AVC diode, about one third for the pentode grid and zero for the detector diode.

These voltages are obtained by returning the AVC diode direct to chassis, the grid to the junction of the bias and AVC cathode resistors and the detector diode to the cathode itself.

Reference to the corrected circuit will show that the AVC diode returns to chassis via its load



Above: The original circuit as it appears in *Trader Sheet 799*. Compare this with the enlarged and corrected section in the next image, in which the bottom of R12 goes to the junction of R13 and R14.

Right: The corrected circuit of the detector and output stages.

resistor, R17, 1.5MΩ; the grid returns via the volume control, R12, 1MΩ, to the junction of R13, 330Ω and R14, 150Ω; and the detector diode returns to cathode via the IF stopper R10, 100kΩ and its load resistor R11, 560kΩ to the cathode.

In order to separate the bias voltages on the detector diode and grid the top of the volume control is fed with AF signals via the DC blocking condenser C24, 0.01μF.

Waxed paper condensers

With this firmly in mind, let us return to repairing the U29. Apart from the two condensers already mentioned, all the original waxed paper types were in situ, and so were all

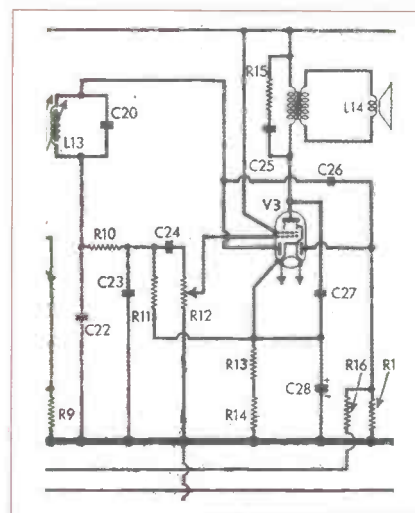
the electrolytics, come to that.

We should, in our preamble, have eliminated any urge to change all the condensers before proceeding, so we will get on with the business of educated diagnosis.

Having checked for continuity through the mains dropper and heaters, for a reasonably high resistance between HT+ and chassis and for the correct disposition of the mains connector for the chassis to be neutral, we plugged the set straight into the mains.

At this stage, let us remind persons addicted to variacs that it would not be a scrap of good endeavouring to 'run up', as they quaintly call it, a U29 by the use of one of those curious devices.

The CY31 rectifier inherited



the cast-iron cathode of its ancestor the CY1 and on a good day with full heater voltage and the wind behind it takes a good three minutes to stagger slowly into life.

With anything much less than 20V you could wait all day for something to happen and professionals don't have the time to spare for such fripperies.

On the initial test run the set hesitated a little then eventually started to produce sounds as we tuned along the medium wave band. This was on its frame aerial and a number of stations came in at reasonable strength but rather questionable quality.

The usual dodge

When we tried the usual dodge of applying the palm of one hand to the frame aerial to apply more signals to it, the volume soared up but with much distortion.

This is where you use your deductive powers. If, as appears likely, the detector was being overloaded it suggests that the AVC



A three-quarter view of the chassis of the U29.



A rear view of the U29.

was not operating correctly and experience in turn suggests that the most likely cause is a leaky decoupling condenser.

It was not hard to locate the 0.1µF used in the U29 for this purpose then to snip off one end and measure its DC resistance as about 500kΩ – not a large leakage but sufficient to drain down the AVC bias.

Replacing this condenser eliminated the overloading on strong signals but left the output still sounding a little distorted.

Again you need to use your

deductive powers to suggest a cause and you should be suspecting the bias on either or both the detector diode and the grid of the output valve.

We have already discussed the purpose of C24 as a DC blocker and it ought to be apparent that if it should leak it would have two unwanted effects.

By introducing a DC path between the detector diode and the grid return of the CBL1 it will simultaneously reduce or even remove altogether the bias on the

latter and also put some negative bias on the former, which is pretty darn clever when you come to think about it.

Again, snipping off one end of C24 and measuring it for DC resistance immediately proved the diagnosis correct.

A replacement resulted in great improvement in sensitivity and sound quality and the repair might well have been considered complete; but in the event we checked the rest of the voltages throughout the set and found just one discrepancy - that on the output valve cathode was a little higher than specified.

A possible reason for this suggested itself as the fixed tone corrector condenser 'twixt anode and cathode of the CBL1 leaking and once again a simple test proved this to be so.

This final replacement brought the performance right up to standard and the U29 is now a firm favourite for workshop listening.

This article first appeared in Issue Number 104 of The Radiophile. More details from Chas Miller on 01785 284696.

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The days of 405-line TV revisited

By Keith Hamer and Garry Smith

Our article in the October 2005 issue of *Television* certainly generated some interesting and useful feedback and we thank the many readers who took the trouble to either respond via the Letters page or get in touch via E-mails. It proves that readers have a keen interest in the subject of archive television and scrutinise everything that is printed.

Let us see if this article stirs more memories from the halcyon days of early television. Unfortunately gremlins did get into the final version of our article and the last paragraph in question, under 'Foreign Interference' should not have been included - this was originally part of an idea about the general growth of television in parts of the UK.

Caradon Hill

As several readers have rightly pointed out, there was never a BBC-1 Band III relay from the Caradon Hill site to supplement the North Hessary Tor Channel 2 broadcasts.

The Channel 12 Caradon Hill 405-line outlet referred to belonged to the ITA and this would have been made clear in a transmitter list but lack of space prevented its inclusion.

Although the Wenvoe Ch13 signal penetrated parts of North Devon, it aired BBC Wales but it did offer an additional service to anyone wishing to use it.

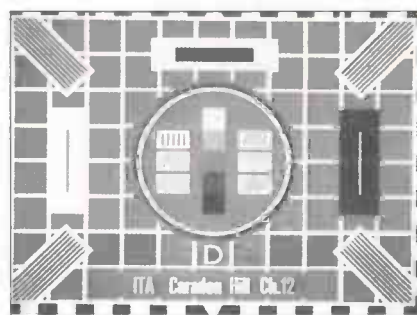
St Hilary

Richard Reynold's implication that TWW did not exist until 1964 is contrary to other information. Indeed, the EBU List of Television Stations (No. 5) published in 1960 lists the St Hilary Channel 10 service as



Above: The Ferguson 3660, one of the last dual-standard TV receivers to be manufactured, fitted with the Thorn (BRC) 1400 Series chassis.

Below: The ITA Test Card D from Caradon Hill.



'TWW Ltd (TWW)'.

Channel 10 had commenced on January 14th 1958 to serve South Wales, the north Devon coast, and parts of Somerset, Gloucestershire and Dorset with coverage extending as far as Blandford Forum.

Channel 10 carried some items of a local nature for South Wales but was not strictly dual-region, as far as separate transmitters go, until the second St Hilary transmitter began transmitting on Channel 7 in early 1965, with the aim of providing a service

with a strong emphasis on Welsh-language programming.

In the Spring of 1964, TWW discovered that they would shortly be required to introduce a service for the whole of Wales in addition to the service already being provided for the west of England and south Wales.

Earlier in 1964, at short notice, the company had undertaken the broadcasting commitments of Wales (West and North) Television Ltd (WWN), a company based at the Wales Television Centre in Cardiff.

The company had supplied programmes to west and north Wales from 1962 under the Teledu Cymru banner but ran into financial difficulties around two years later.

Meanwhile, the Independent Television Authority announced its intention of extending the Welsh network of transmitters by adding a new aerial to the St Hilary mast in Glamorgan.

The sixty hours of programming required each week to provide the two services from St Hilary comprised of programmes produced at TWW's studio centres in Bristol and Cardiff, supplemented by material sourced from the other independent companies and films purchased externally.

The complex technical process of blending programmes and commercials into the two services and feeding the two separate signals to the transmitters was carried out at a new master control room at Pontcanna, Cardiff. The original control room could cope with only one service.

The existing equipment from the old master control room had to be transferred to the new site, piece-by-piece without any break in the daily transmissions.



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405-LINE TRANSMISSION DETAILS

BAND I

CHANNEL	VISION (MHz)	SOUND (MHz)	Final Number of Transmitters	
			ITV	BBC
B1	45.00	41.50	0	24
B2	51.75	48.25	0	16
B3	56.75	53.25	0	19
B4	61.75	58.25	0	21
B5	66.75	63.25	0	19

BAND III

CHANNEL	VISION (MHz)	SOUND (MHz)	Final Number of Transmitters	
			ITV	BBC
B6	179.75	176.25	5	3
B7	184.75	181.25	4	1
B8	189.75	186.25	9	1
B9	194.75	191.25	7	0
B10	199.75	196.25	6	1
B11	204.75	201.25	8	0
B12	209.75	206.25	4	2
B13	214.75	211.25	4	3
B14*	219.75	216.25	0	0

*This channel was never used.

Fig. 1: The ITA tuning caption radiated by the Moel-y-Parc transmitter. Earlier versions displayed the transmitter names rather than the name of the programme contractor.

Fig. 2: The BBC Wales / Cymru Identification Symbol.

Fig. 3: The TWW Channel 10 logo radiated from the St. Hilary transmitter.

Fig. 4: The Teledu Cymru logo.

Fig. 5: A psychedelic identification logo from Harlech TV.

Fig. 6: The HTV Wales logo.

Fig. 7: The Rediffusion London station identification logo.

Fig. 8: The well-known Rediffusion 'star' which twirled between commercials.

Fig. 9: The "Bat's Wings" Identification Symbol from BBC West, radiated by the Wenvoe Channel B5 transmitter.

Fig. 10: The BBC Scotland version of the BBC "Bat's Wings" Identification Symbol.

There were two announcers' studios, one for each service, seven teleciné machines and an adjoining glass-panelled videotape area which housed three machines - the area was specially treated to absorb the noise which the VTR machines created whilst in operation.

In addition to the new master control room, an extra studio was required to cope with the increase in local programme production. The total cost of the TWW extension and development

project was about £380,000, making it one of the most modern television production centres in Europe.

Incidentally, ITA 405-line transmitters at Abergavenny, Brecon, Ffestiniog and Llandrindod Wells entered service during 1969, the same year that colour was introduced to ITV and BBC-1.

Wenvoe UHF Service

Regarding the replacement UHF service from Wenvoe, Richard was

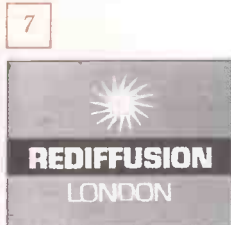
correct in pointing out that HTV never aired from Caradon Hill or Huntshaw Cross, only from Mendip.

The text was a little ambiguous and should have read to the effect that those viewers wishing to continue receiving HTV (West) would require aerials directed at the Mendip transmitter, located south of Bristol.

In areas further along the South Wales coast, alternative transmitters such as Huntshaw Cross or even Caradon Hill would



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need to be used to continue receiving English broadcasts but, of course, these would originate from Westward Television, a different ITV contractor.

Since the introduction of digital TV in 1998, Huntshaw Cross reception has been degraded by Carmel digital. In the village of Caerhendy, the topography meant that Carmel pictures were severely affected by multi-path distortion and Huntshaw Cross was the only viewable option, until digital struck and degraded all four channels! A repeater was installed which relays Welsh programmes but not everyone in the community favoured this move.

405-Line Memories

Both Alan Pemberton (Sheffield) and Simon Hockenhull (Bristol) recall that as BBC relays (both in Band I and Band III) took their feeds off-air from the main Band I transmitters, the effects of Sporadic-E could still be experienced if the offending signals entered the receiving antenna at the relay site.

Assuming that a substantial and well-designed receiving antenna was used at the relay site, the resulting protection offered from continental broadcasts should have been far superior than that provided by viewers' own aerials, particularly in areas of low field-strength shielded from the transmitter areas but exposed to incoming Sporadic-E signals.

Some of the relays also produced subtle 'mysteries' for the TV DX-er such as the relaying of Sporadic-E signals on unusual frequencies.

Simon once lived in West Cornwall on the edge of the North Hessary Tor service area and low field strengths meant that Sporadic-E interference was rife during the summer months creating many viewers' complaints.

Viewers using the Channel B1 transmission from Redruth did not escape the wrath as Redruth relayed the off-air Channel B2 signal from North Hessary Tor.

Unlike other parts of the country, which were assigned extra Band III stations, viewers in the south-west had to wait for the opening of the new 625-line service from Caradon Hill,

Redruth and Stockland Hill before being freed from the dreaded continental interference problem on BBC-1.

Interestingly, 405-line viewers who were still relying on the Redruth B1 service, benefited greatly when the new 625-line service commenced from Redruth and Caradon Hill.

Instead of relaying the Channel B2 signal from North Hessary Tor, the 625-line Redruth BBC-1 broadcast was converted to 405-lines.

There was probably nowhere else in the country where the new UHF services were more eagerly awaited or taken up. As a TV technician, Simon remembers seeing a rash of new UHF aerials being erected in 1971 with many viewers replacing their old sets for the new single-standard 625-line mono TV sets.

BRC (Thorn) 1500's, the ITT/KB VC200 and the Pye 169/569 series of receivers seemed to be the most popular of the, then, new sets. Of course, many people rented in those days so it was just a case of upgrading an existing contract or replacing the existing one.

Alan tells us that ITV also conducted 405-line colour tests using PAL, SECAM and NTSC formats.

Multi-Channel TV

In those early magical days of the sixties, ITV stations were truly regional with relatively few networked programmes. Some sitcoms and quiz shows were shown at different times, or on different days, so if more than one region could be received, the viewer need not have missed their favourite programme. Don't forget that the sheer luxury of domestic video recorders was many years away.

In the Derby, one housing estate was treated to multi-channel television. This involved receiving Granada signals from the Emley Moor mast thus providing an alternative ITA region to ATV, which was the main service provider for the area via the Channel 8 transmitter at Lichfield.

At some stage, a third ITV region was to be added, which was referred to as 'West ITV' by neighbours, but as the family home was not connected to the cable, first-hand experience of

this ITA station, was not possible.

With hindsight, we can only conclude that signals would be received from the Moel-y-Parc transmitter, which broadcast mainly in the Welsh language.

Band III must have been used for delivery as the other main channels were allocated Band I frequencies, namely BBC Midlands on Ch1, Granada ITV on Ch3, ATV on Ch5.

BBC Midlands and BBC North occupied their true channels on 4 and 2 respectively. Perhaps there are some ex-Telefusion technicians who could add more information about the third ITV region?

Later, the cable system developed severe leakage and the Granada ITV pictures in Band I could be viewed on the family receiver which was not connected to the system.

As one can imagine, Band I was packed with strong over-active nuisance carriers from five 405-line channels thus making life for a budding TV DX-er extremely difficult!

Double Your Money

The hope of receiving additional ITV regions over greater-than-normal distances had first been inspired when a French contestant appearing on the quiz show 'Double Your Money' claimed that his family in Paris would be watching the show via an elaborate aerial system rigged up by a technical friend at his home.

The big break came in late 1967, when, after an exhausting school cross-country run one cold foggy afternoon, the urge to play with the TV tuning in the comfort of a warm living room became irresistible.

A simple rod aerial which plugged directly into the aerial socket of the ageing Philips was temporarily in use at the time and on switching to Channel 9, steady pictures were seen, which were later confirmed as originating from Croydon when the Rediffusion star symbol appeared between the adverts.

The signal finally weakened and no amount of aerial repositioning would restore the picture to its former glory. By 5 o'clock, Channel 9 was blank once more: tropospheric propagation had been unknowingly encountered.

BBC and ITV 405-line transmitters

Channel B1

Crystal Palace	200kW	V	BBC-1
Ashkirk	18kW	V	BBC-1
Divis	12kW	H	BBC-1
Redruth	10.3kW	H	BBC-1
Thrumster	7kW	V	BBC-1
Llanddona	5.7kW	V	BBC-1
Llandrindod Wells	1.3kW	H	BBC-1
Scarborough	520W	H	BBC-1
Grantown	380W	H	BBC-1
Churchdown Hill	250W	H	BBC-1
Pitlochry	212W	H	BBC-1
Weardale	160W	H	BBC-1
Skegness	120W	H	BBC-1
Sheffield	50W	H	BBC-1
Weymouth	50W	H	BBC-1
Llangollen	40W	H	BBC-1
Kendal	25W	H	BBC-1
Penifiler	25W	H	BBC-1
Carmarthen	22W	V	BBC-1
Lochgilphead	20W	V	BBC-1
Wensleydale	20W	V	BBC-1
Ballater	10W	V	BBC-1
Millburn Muir	10W	V	BBC-1
Kinlochleven	3W	V	BBC-1

Channel B2

Holme Moss	100kW	V	BBC-1
Rosemarkie	20kW	H	BBC-1
North Hessary Tor	14kW	V	BBC-1
Swingate	1.4kW	V	BBC-1
Londonderry	1kW	H	BBC-1
Oxford	700W	H	BBC-1
Kilvey Hill	500W	H	BBC-1
Brighton	400W	V	BBC-1
Cambridge	100W	H	BBC-1
Ballachulish	60W	H	BBC-1
Ayr	50W	H	BBC-1
Hereford	50W	H	BBC-1
Port ellen	50W	V	BBC-1
Cardigan	45W	H	BBC-1
Rosneath	20W	V	BBC-1
Dundee Law	9W	V	BBC-1

Channel B3

Kirk O' Shotts	100kW	V	BBC-1
Rowridge	100kW	V	BBC-1
Tacolneston	40kW	H	BBC-1
Skriaig	12kW	H	BBC-1
Bressay	6kW	V	BBC-1
Morecambe Bay	5.3kW	H	BBC-1
Blaen-Piwyf	2kW	H	BBC-1
Barnstaple	200W	H	BBC-1
Swindon	170W	H	BBC-1
Bexhill	150W	H	BBC-1
Northampton	90W	V	BBC-1
Larne	50W	H	BBC-1
Machynlleth	50W	H	BBC-1
Rye	50W	H	BBC-1
Richmond	45W	V	BBC-1
Abergavenny	30W	H	BBC-1
Kilkeel	25W	H	BBC-1

Isles of Scilly	20W	H	BBC-1
Llanelli	16W	V	BBC-1

Channel B4

Sutton Coldfield	100kW	V	BBC-1
Sandale	28kW	H	BBC-1
Melvaig	27.4kW	V	BBC-1
Mel drum	17kW	H	BBC-1
Manningtree	4.8kW	H	BBC-1
Haverfordwest	4.3kW	H	BBC-1
Oban	3kW	V	BBC-1
Les Platons	1kW	H	BBC-1
Bude	100W	V	BBC-1
Ballycastle	50W	V	BBC-1
Okehampton	40W	V	BBC-1
Whitby	40W	V	BBC-1
Betws-y-Coed	35W	H	BBC-1
Folkestone	35W	H	BBC-1
Sidmouth	30W	H	BBC-1
Newry	29W	V	BBC-1
Hungerford	25W	H	BBC-1
Perth	25W	V	BBC-1
Girvan	20W	V	BBC-1
Hastings	13W	H	BBC-1
Holyhead	7.8W	H	BBC-1

Channel B5

Wenvoe	100kW	V	BBC-1
Pontop Pike	17kW	H	BBC-1
Orkney	14kW	V	BBC-1
Forfar	5.3kW	V	BBC-1
Broucher Mountain	3.4kW	V	BBC-1
Douglas	2.8kW	V	BBC-1
Fort William	1.6kW	H	BBC-1
Peterborough	1kW	H	BBC-1
Toward	234W	V	BBC-1
Ffestiniog	50W	H	BBC-1
Kingussie	35W	H	BBC-1
Campbeltown	30W	V	BBC-1
Canterbury	30W	V	BBC-1
Aldeburgh	25W	V	BBC-1
Dolgellau	25W	V	BBC-1
Eastbourne	20W	V	BBC-1
Maddybenny More	20W	H	BBC-1
Bodmin	10W	H	BBC-1
Ventnor	9.6W	H	BBC-1

Channel B6

Sandy Heath	30kW	H	Anglia
Sandale	28kW	H	BBC-1
Moel-y-Parc	21kW	V	BBC-1
Ridge Hill	10kW	V	ATV
Newhaven	1kW	V	Southern
Scarborough	1kW	H	Yorkshire
Bath	250W	H	BBC-1
Sheffield	100W	V	Yorkshire

Channel B7

St. Hilary	100kW	V	Harlech (Welsh)
Belmont	20kW	V	Anglia
Bala	100W	V	Harlech (Welsh)
Whitehaven	100W	V	Border
Marlborough	25W	H	BBC-1

Channel B8

Lichfield	400kW	V	ATV
Burnhope	100kW	H	Tyne Tees
Presely	100kW	H	Harlech (Welsh)
Strabane	100kW	V	Ulster
Rumster Forest	30kW	V	Grampian
Richmond hill	10kW	H	Border
Rothsay	1kW	V	Scottish
Bath	500W	H	Harlech (English)
Brecon	100W	H	Harlech (Welsh)
Newhaven	50W	V	BBC-1

Channel B9

Durris	400kW	H	Grampian
Croydon	350kW	V	Thames/LWT
Black Mountain	100kW	H	Ulster
Stockland Hill	100kW	V	Westward
Winter Hill	100kW	V	Granada
Fremont Point	10kW	H	Channel
Llandrindod Wells	2.5kW	H	Harlech (Welsh)

Channel B10

Black Hill	475kW	V	Scottish
Emley Moor	200kW	V	Yorkshire
St. Hilary	200kW	V	Harlech (English)
Dover	100kW	V	Southern
Arfon	10kW	H	Harlech (Welsh)
Bedford	3kW	H	BBC-1
Aviemore	1kW	H	Grampian

Channel B11

Mendlesham	200kW	H	Anglia
Caldbeck	100kW	H	Border
Chillerton Down	100kW	V	Southern
Angus	50kW	V	Grampian
Moel-y-parc	25kW	V	Harlech (Welsh)
Huntshaw cross	500W	H	Westward
Abergavenny	100W	H	Harlech (Welsh)
Llandovery	100W	H	Harlech (Welsh)

Channel B12

Caradon Hill	200kW	V	Westward
Winter Hill	125kW	V	BBC-1
Mounteagle	50kW	H	Grampian
Membury	30kW	H	ATV
Lethanhill	2kW	V	Scottish
Ammanford	20W	H	BBC-1

Channel B13

Wenvoe	200kW	V	BBC-1
Selkirk	25kW	V	Border
Belmont	20kW	V	BBC-1
Ballycastle	100W	H	Ulster
Ffestiniog	100W	V	Harlech (Welsh)
Rosneath	100W	V	Scottish
Llanidloes	20W	H	BBC-1

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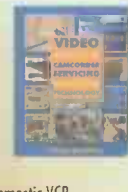
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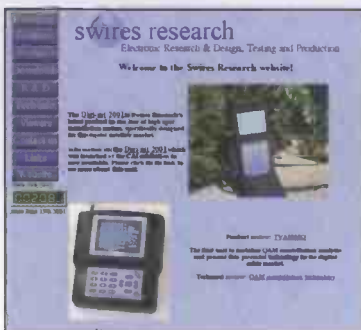


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Black Diamond	BD68STB	IRC83079	Nokia	121T	IRC83078
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Ferguson	FDTT2500	IRC83115	Sagem	ITD602	IRC83105
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Fusion	FRT101T	IRC83114	Sagem	ITD62	IRC83105
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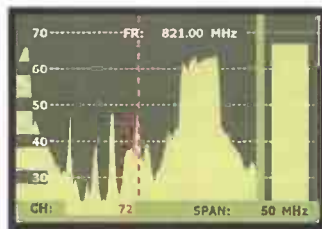
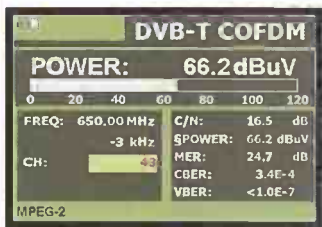
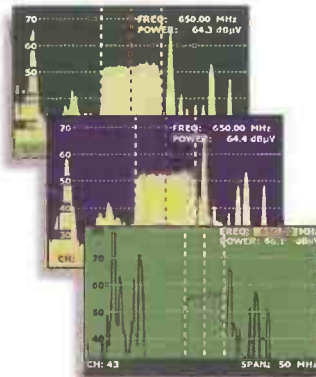
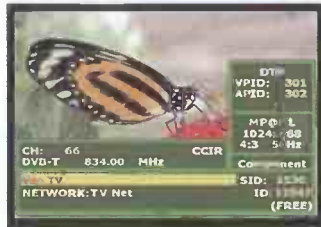
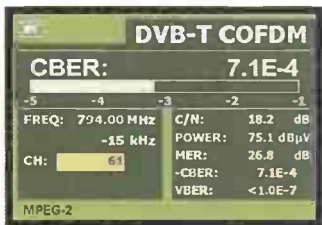


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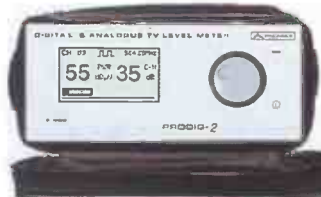
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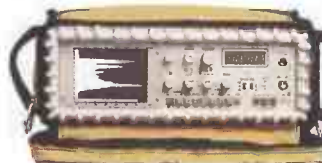
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