

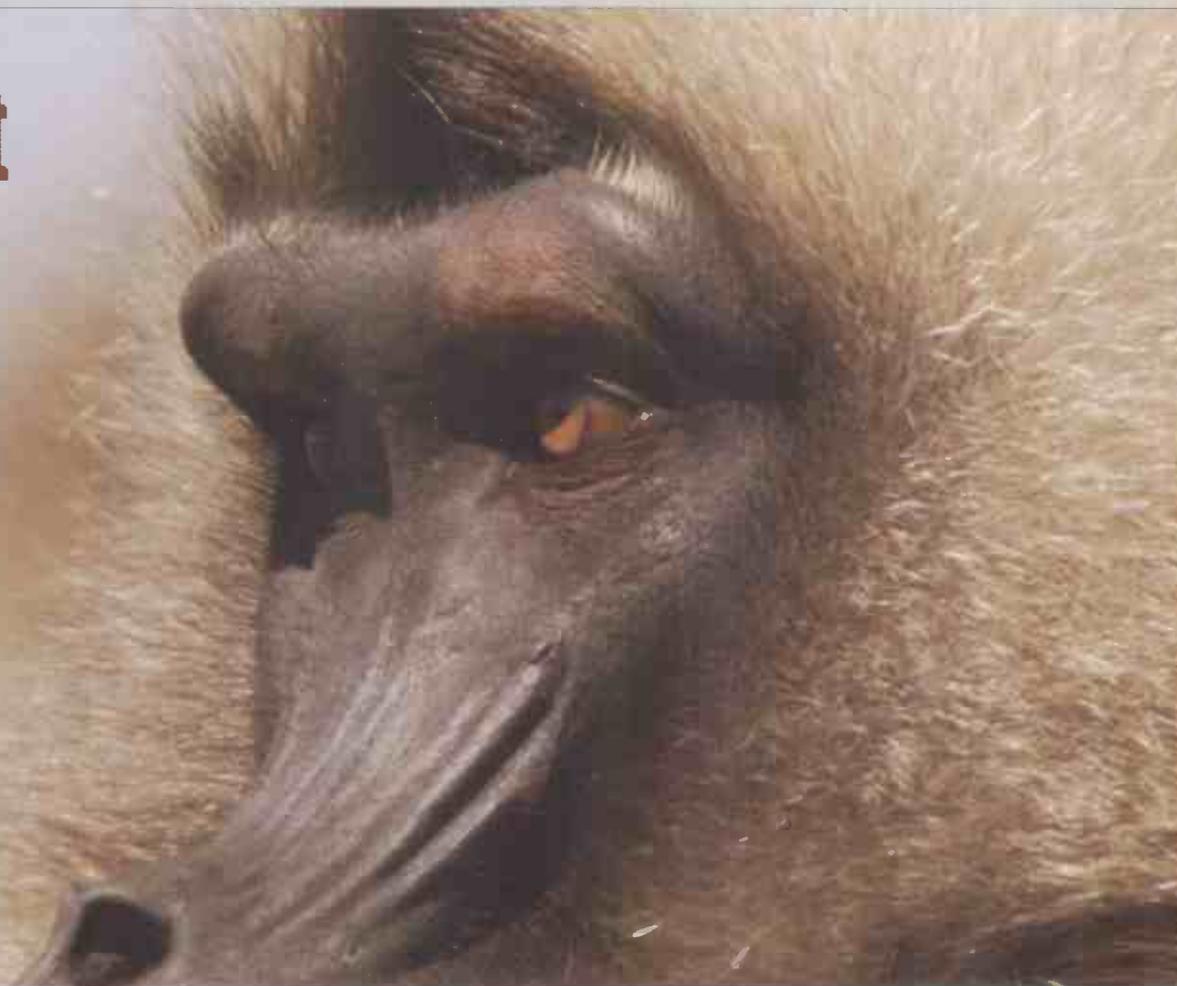
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What a life!

I have enjoyed reading Donald Bullock's column since I first joined *Television* magazine late last year, and I am sure most of my readers have too over the years.

Against a backdrop of ever-tightening budgets, Donald's column is one that I resisted axing when I first took as editor, but all good things come to an end sooner or later, and given market conditions, this has unfortunately been another casualty.

However, I am delighted that Donald has agreed to continue writing for us. Henceforth, 'Donald Bullock's Servicing Commentary' will take the form of fault reports, so I am pleased that I can retain his technical knowledge and wealth of experience for the benefit of my readers.

I like to think that my readers are smarter than average, and fault reports are the bread-and-butter of the consumer electronics servicing trade.

For outsiders, the content may seem a bit dry and obscure, so a light-hearted touch helps us keep our sense of humour, and I must say that some things said by *Television's* fault reporters have sometimes made me smirk or giggle.

Take for example the case in this issue of two different reporters independently taking the mickey out of Philips products.

Is this really deserved? I mean, Philips is one very big fish in our pond, and to stay up there year-after-year despite all the ups and downs, they must be doing something right.

Anyway, to get back to our trade, some parts of it have a brighter future to look forward to than others. Take the aerial installers for example. They will have the equivalent of the Corgi mark for gas fitters - that of Registered Digital Installer.

I first introduced the scheme last month, and this month I report on its official inauguration at the House of Commons.

This issue also carries a lot of market research both from Ofcom and Continental research.

Another new report, from media research company Screen Digest analyses the uptake of high definition television worldwide.

The report, 'High Definition Television: Global uptake and

assessment to 2010', says that at the end of 2005 there were already two million 'HD ready' TV households in Europe and by 2010 there will be more than 50 million 'HD ready' TV sets, creating large opportunities for European pay TV operators.

Screen Digest predicts that by 2010 there will be approximately 100 HD channels available in Europe and more than 11 million households will be watching television in HD quality.

Screen Digest expects 12 million European TV households will receive HDTV programmes and watch them on an HD-ready television set. This will include 9 million pay TV subscribers and 3 million free-to-air households.

Worldwide, there were 67 HDTV channels by year end 2005. Strong growth in HD broadcast channels will take place in 2006 and from then on we will see steady growth to 2010, when we forecast over 200 HD channels worldwide.

In early 2006, HD broadcasts were available in 12 countries: USA, Canada, Japan, Australia, South Korea, China, Germany and Austria, and the Nordic markets (Sweden, Finland, Denmark, Norway).

On a global basis, by the end of 2010 the number of HD ready households will reach 174 million or 22% of TV households. The figure will be 59% in the US, 66% in Japan and 30% in Western Europe, where 66 million households will be equipped by 2010.

BSkyB identifies HD as a key factor in its quest to reach 10 million subscribers by 2010.

The uptake of HD will be fuelled by developments in the hardware and broadcasting industries. Pay TV operators will leverage the fast-growing market for HD-ready flat television sets. Premiere, BSKyB, TPS, Canal+, Sky Italia will launch HD services in 2006.

In the short term, strong sales of HD-ready TV sets at Christmas 2005 and in the run up to the World Cup in July 2006, which will be broadcast in HD, will be two strong market drivers for HD broadcasts. Free-to-air players broadcasters will also need to migrate to HD in order to match the technical quality of DVD and in future, high definition DVD.

Virgin Mobile Accepts NTL Offer

NTL and Virgin Mobile have announced that the pre-conditions set out in the offer announcement made on 16 January 2006 have been satisfied and that they have reached agreement.

Virgin Mobile Shareholders can elect for:

- (1) The Cash Offer of 372 pence in cash per Scheme Share held; or
- (2) the Share Offer of 0.23245 NTL Shares per Scheme Share held, valued at 389 pence per Scheme Share based on NTL's closing price and the US\$/£ exchange rate at 3 April 2006; or
- (3) the Share and Cash Offer by NTL and the Cash Offer of 0.18596 NTL Shares and 67 pence in cash per Scheme

Share held, valued at 311 pence per Scheme Share based on NTL's closing price and the US\$/£ exchange rate at 3 April 2006 plus 67 pence in cash.

The Cash Offer values the existing issued share capital of Virgin Mobile at approximately £962.4 million.

It represents a premium of 19.6 per cent. to the Virgin Mobile Share price on 2 December 2005, the last business day prior to the commencement of the offer period.

NTL has entered into a 30-year exclusive brand licence with Virgin Enterprises for the use of the Virgin brand for NTL's consumer business.

Virgin Mobile's

operating business will continue to be led by members of Virgin Mobile's current management team, and it is intended that a marketing director from Virgin will join NTL, bringing Virgin's brand expertise to the NTL management team.

Commenting on the Offer, James Mooney, Executive Chairman of ntl, said: "We are delighted to announce the recommended Offer and the brand licensing with

Virgin today, which not only delivers mobile capability to our product bundle but also gives us access to a leading consumer brand.

"Central to today's announcement is our strong belief that offering a quad-play underpins true media convergence, and offering high quality communications services will, we believe, appeal to existing subscribers of the enlarged business as well as new customers."

SMG boosts profit

SMG, owner of Scottish Television and Virgin Radio, has increased profit but warned that advertising markets remain volatile.

Chairman Chris Masters said: "Advertising markets have remained uncertain and short term in the first quarter of 2006."

SMG said pre-tax profit halved to £18.8 million for the year to December from £37.6 million, while underlying profit increased 46% to £20.0 million.

Revenues rose 4% to £210.0 million. Earnings per share fell 62% to 4.6p.

The group noted that its television business, which also includes Grampian TV, outperformed ITV1 in airtime revenues while radio station Virgin produced a market-beating performance with revenues up 11% and operating profits rising by 23%.

SMG has proposed a

16% increase in its full-year dividend to 2.9p.

Commenting on the latest results, SMG chief executive Andrew Flanagan said: "Overall, this has been a solid trading result for SMG, coupled with some positive regulatory outcomes, which has resulted in a year of strong progress."

SMG, which is partially owned by ITV, recently announced plans to cut around 55 posts, blaming a reduction in the amount of news and regional programming it is required to make and the introduction of new technology at its new £30m headquarters.

Although the group warned of a decline in first-quarter revenues amid a volatile advertising market, it said it expected a "much stronger" second quarter due to the forthcoming World Cup.

Museum heralds the future



Bradford's award-winning National Museum of Photography, Film & Television (NMPFT) has recently installed a Yamaha DM1000 Digital Mixing Console.

"We use the DM1000 for production and post-production work for our programme of temporary exhibitions, for exhibits in our permanent galleries and in support of the Museum's education department," said John Tremouth, the Museum's Senior Curator of Television.

"We used a Yamaha O3D mixer for many years but it finally needed replacing," continued Tremouth.

"The desk seemed to fit the bill perfectly and being much the same size as the

O3D there was no need for extensive modifications to our editing suite.

"More importantly, my own experience of Yamaha desks (Tremouth personally owns 4 O2R's) has always been good."

Part of the Museum's attraction for visitors are the numerous interactive exhibits, many of them relying heavily on sound for effect or interpretative explanations and this can be challenging for the Museum's technical team particularly when working with older recordings. "We use Apple's Final Cut Studio in conjunction with the desk and undertake a lot of multi format work," Tremouth added.

IFA show goes annual

In future Berlin can look forward to the IFA trade show every year.

Encouraged by a surge in Europe's consumer electronics market, European sales of 100 billion euros and double-digit growth, as well as outstanding results at the IFA 2005, the event's organisers Gesellschaft für Unterhaltungs- und Kommunikationselektronik (gfu) and Messe Berlin have decided to expand the IFA concept.

Dr Rainer Hecker, chairman of the Supervisory Board of the gfu said: "In the years to come the IFA must continue to set the pace in



this sector and be a leading international event.

"The dynamic nature of growth and innovation in this sector requires consistent expansion of a successful concept".

The dates of the upcoming IFA, the world's leading consumer electronics event, are 1 to 6 September 2006, the customary start to the CE retail trade season.



High speed HDTV amplifiers

STMicroelectronics has announced two new 300MHz amplifiers designed to drive very high-definition signals on 75-ohm video lines in HDTV-enabled set top boxes and DVD players.

The TSH340 and TSH341 video amplifiers feature operation on a single 3-5V single power supply, with the capability to drive the video signal very close to 0V.

The TSH340 is a buffer with internal gain set at 6dB to allow the right level of video signal while maintaining good line matching.

The TSH341 is an op-amp that uses the same voltage feedback architecture as the TSH340, but allows the gain to be set externally.

Both use a very high-speed 0.25-micron complementary manufacturing technology to achieve up to 300MHz bandwidth for only 9.8mA quiescent current.

The amplifiers are input/output negative rail, which allows them to drive the signal to within 60mV of ground – guaranteed by production testing – while operating on a single 5V supply, and enables the video signal to be driven directly from the DAC output without any transition capacitance.

The use of a single power supply, eliminating the need for the negative supply that is usually required, reduces the complexity of applications using the devices.

Falling television kills toddler

A three-year-old girl was killed when a 32-inch television fell on her head, an inquest has heard.

The TV fell on Amber Vaughan while her parents were in bed at their home in Barnwood, Gloucester.

Amber was playing with her twin sister on 4 January, when the TV toppled from a chest of drawers and crushed her.

In recording a verdict of accidental death, coroner Alan Crickmore said he was satisfied the tragedy occurred as the consequence of an accident.

"Amber died as a result of the injuries she received when the television set fell somehow from the chest of drawers on to her head.

"I am absolutely satisfied that there was no evidence of any third party involvement which is to be criticised.

"I am satisfied that this tragedy occurred as a consequence of an unintended occurrence," he said.

BBC responds to Lords' Charter Review

The BBC has responded to a report published by the Lords Select Committee on BBC Charter Review.

The BBC says: "We believe we have put forward a well thought-through licence fee bid which represents good value for money and meets the objectives set by the Government for building a digital Britain.

"The BBC's licence fee bid is very clear in its objective to deliver value to licence payers.

"In order to deliver the purposes outlined by the Government, the BBC is finding more than 70% of the funding required through its own cuts, not from additional licence fee funds.

"As far as the move to Greater Manchester is concerned, we have always stated that we will continue to reassess the costs as plans develop to

ensure they deliver robust value for money.

"The licence fee itself is still declining steadily as a proportion of disposable income, and will continue to do so even with the settlement the BBC has requested.

"We have tested our proposals and their costs with licence fee payers and are clear that they have public support.

"However, we have made it clear to Government that our agreement to fund the cost of helping the neediest in digital switchover is subject to a number of conditions: this cost should not be at the expense of existing services; and it should not undermine long-term support for the licence fee."

The BBC says it needs the money in a world in which broadband internet and on-demand services will become widespread.

ITN welcomes BBC Charter

Commenting on the Government's White Paper on the BBC Charter, Mark Wood, Chief Executive of ITN, said: "The creation of the BBC Trust marks the Government's intention to create clear separation between the BBC's management and its regulation.

"However, it will be vital for the Trust's decisions to demonstrate fair balance and independence as there remains some scepticism from commercial competitors that the Trust will be truly impartial."

ITN welcomes the emphasis placed on the importance of a dynamic media sector and safeguarding competition.

"We are pleased that the White Paper confirms Ofcom's role in conducting the market impact assessment for any new BBC service," Wood added.

"However, we do not believe the Trust should be able to over-ride Ofcom's assessment on the grounds of Public Value if it is clearly demonstrated that a service would distort the market."

The fact that all BBC services must now have a Service Licence is a helpful development.

However, ITN is very concerned that it will be the Trust's decision alone as to whether the BBC's new media services will require a Service Licence or not.

"The BBC has already said it proposes only to have a single Service Licence for BBC Online, so that the Creative Archive, MyBBCPlayer, the BBC's content to mobile and other such services will have no measurable remit.

"This falls short of the transparent approach we've all been promised," he said.

ITN welcomes the overhaul of the BBC's fair trading regime required by the White Paper, in particular:

- Its application, for the first time, to the BBC's publicly-funded as well as commercial services.
- The explicit duty on the BBC in the new Charter to have regard to competition issues.
- A new system of ex ante rules or codes operated by the Trust and drawn up in consultation with Ofcom.
- The appointment of a competition expert to the Trust.

"ITN has been unimpressed in the past by the BBC Governors' cursory treatment of complaints we have made under the Fair Trading Commitment," Wood continued.

"Though we would have preferred an external regulator like Ofcom to be responsible for competition complaints, we are pleased that the BBC's fair trading policy will be toughened up and will now apply to its public services as well as commercial ones.

"We do not want to stop the BBC developing new services and offering value to the British licence payer, but past experience has shown us that BBC activity can damage commercial services, particularly in new media markets, and it has been difficult to get the Governors to take such issues seriously."

He concluded: "Much depends on the ability of the Trust to deliver independent and impartial decisions."

Horizon HDTM Competition winner



The winner of the Horizon HDTM terrestrial meter competition is Frank C Thorne of Judgecard Ltd in St Austell, Cornwall.



There was standing room only at the HDTV seminar held as part of Industry Day at the College of North West London in March.

Later in the day, an HDTV demonstration proved to be one of the more popular attraction competing with the likes of a 20-ton truck engine and a virtual reality show demonstration.

"This is a new technology and everyone is interested to know about it," said Fawzi Ibrahim who organised the event.

Those who watched the demonstration were very impressed by the clarity of the picture and the fine details that are made visible by HD broadcasts.

"HDTV will certainly feature as one of the courses next academic year," said Fawzi. "For practicing engineers, a one day HDTV course is available which covers both the HD decoder/receiver and the HD Ready television set."

Fawzi Ibrahim may be contacted on 07976 350724 or email: Fawzi.ibrahim@cnwl.ac.uk.

Pace complies with RoHS

Pace Micro Technology has achieved a 100% RoHS compliant bill-of-materials for its set top box design – 3 months ahead of the 1st July deadline.

The RoHS Directive bans the placing on the EU market of new electrical and electronic equipment containing more than agreed levels of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants from 1 July 2006.

Richard Eltherington, Hardware Quality Assurance Manager for Pace commented: "As a global set-top box developer, with manufacturing centres around the world, we



welcome directives, such as RoHS, which provide environmental regulation for the industry.

"Pace engineers have been designing set top boxes with RoHS compliance in mind for the last two years,

and the result is that we have been able to meet the RoHS requirements well ahead of time."

Warner Bros and TI join HD alliance

Warner Bros Technical Operations and Texas Instruments (TI) have joined the High-Definition Audio-Video Network Alliance (HANA).

Warner Bros will support the content provider segment of the alliance, while TI will contribute IT expertise.

Warner Bros and TI join Charter Communications, Mitsubishi Digital Electronics America, JVC, NBC Universal, Samsung and Sun Microsystems as promoter members in the organization.

AMD, Digeo, Marvell, NDS, Oxford Semiconductor, TC Applied Technologies, Vidiom Systems, Accelerated Technology and VividLogic have also joined the alliance.

Along with current contributor members ARM,

Freescale Semiconductor and Pulse-LINK, HANA has reached the milestone of 20 members.

"We are pleased to welcome Warner Bros and TI as promoter members," said Dr Heemin Kwon, HANA president and Samsung executive vice president.

"This clearly demonstrates that HANA has the industry support and momentum to develop the products and services that will enhance the consumer HD experience."

"As a content provider, Warner Bros wants consumers to be able to enjoy HD content anywhere in their home, while maintaining content security," said Alan Bell, executive vice president, Warner Bros Technical Operations.

"HANA provides an

excellent means of setting the reference designs to make that a reality."

"TI is excited about being a part of HANA, and as the market leader in IEEE-1394 (FireWire) silicon, we see great potential in transporting high definition content in the home network environment," said Zephra Freeman, strategic marketing manager at TI's Digital Interface Business Unit.

"With HANA leveraging both the bandwidth and content protection capabilities offered by 1394, our participation positions us well to influence silicon solutions."

Warner Bros Technical Operations is responsible for identifying and developing technologies that facilitate Warner Bros. Studio's business development and growth.

Eliminate HDTV motion blur

The latest generation FRC 94xyH high-definition frame rate converter IC from Micronas eliminates motion blur and film judder on HDTVs.

Driven by the need to eliminate the motion blur that limits today's LCD performance, the new truD HD technology is claimed to be the world's first IC that can generate 120 frames per second (fps) from 50/60Hz broadcast content and even from 24 fps film sources.

Judder and motion blur are very visible on large screens, such as 32-inch and bigger.

De-juddering is the process of converting film, originally shot at 24 fps, to the typical TV display frame rates of 50 or 60 Hz, using motion vector estimation and compensation.

IET woos young engineers

Europe's largest professional society for engineers, the Institution of Engineering and Technology (IET) has been launched in London.

The new Institution has been formed by the Institution of Electrical Engineers (IEE) and the Institution of Incorporated Engineers (IIE) and will have more than 150,000 members worldwide.

Speaking at the launch the Institution's President Sir John Chisholm said: "We have come into being at a time when the demands on engineering and the expectations of the public about our profession have never been greater.

"Our Institution will commit itself to use the skills and experience we have to promote the contribution engineering and technology makes to



the well being of society."

Sir John presented the first member of the new Institution, Na Yao who is

completing a PhD in the Department of Electronic Engineering at Queen Mary University of London.

Sharp optimises LCD TVs for PAL

Following in the footsteps of the Aquos P50 Series, and incorporating Sharp's unique PAL Perfect Picture (PPP) technology, the Aquos LC-26P70E, LC-32P70E and LC-37P70E (26", 32" and 37"

respectively) are able to reproduce the UK PAL broadcast signal, with their 960 x 540 panel resolution providing a low noise picture.

Key features include built-in Freeview digital terrestrial tuner (DVB-T), PPP (PAL Perfect Picture)

technology, 1080i and 720p HD signals, advanced super view and black TFT

LCD panel, HDMI digital interface, dynamic contrast enhancement), clear voice function, auto volume control and PC Input (Analogue RGB).

In addition to their

for forthcoming High Definition (HDTV) broadcasts, featuring an HDMI interface with HDCP copy protection.

HD performance is impressive, with a straightforward half or three quarter downscale conversion from 1080i or 720p signal to 540 lines.

The Aquos LC-26P70E, LC-32P70E and LC-37P70E offer inputs for connection to a wide variety of sources: two Scart, AV/S-Video

In, Audio Out, HDMI In, CI Slot (Top Up TV) and PC In.



suitability for the PAL signal, the P70 Series models are future-proofed

Toshiba debuts HD DVD player

Toshiba has started selling the world's first commercially available DVD player in Japan, ahead of the Sony-led group that is competing with the Toshiba-led camp for new global DVD standards.

The HD-XA1 supports playback of pre-recorded HD DVDs.

The HD DVD format is competing with the Blu-ray Disc format advocated by the Sony-led group.

Meanwhile, Sony has said it will put its first BDP-S1 Blu-ray Disc players on sale in North America in July for \$1,000 each.

Sony and Matsushita are leading a group of companies that is pushing Blu-ray technology. Toshiba, NEC and others are behind the HD DVD format.

The cheaper of the two Toshiba models is priced at \$500, half the price of the Sony player.

"We are in a unique position to be unveiling a full line of HD products that capitalize on Blu-ray Disc's technological advantages," said Sony president Hideki Komiyama.

Microsoft delays Vista launch

Microsoft has delayed the release of its consumer Windows Vista operating system until January 2007, according to press reports.

Jim Allchin, co-president of platform products and services at Microsoft, said that the company decided to delay the consumer version of Vista because PC manufacturers required more time to test and prepare their systems.

"We will release to manufacturing and sit on the disk for the consumer launch," he said.

US designates al Manar as terrorist television station

The US Department of the Treasury has designated al Manar, a satellite television operation, which it claims is owned or controlled by the Iran-funded Hezbollah terrorist network, and frozen its assets.

Additionally designated were al Nour Radio and the Lebanese Media Group, the parent company to both al Manar and al Nour Radio.

Al Manar and al Nour are said to be the media arms of the Hezbollah terrorist network and to have facilitated Hezbollah's activities.

"Any entity maintained by a terrorist group – whether masquerading as a charity, a business, or a media outlet – is as culpable as the terrorist group itself," said Stuart Levey, Treasury Under Secretary for Terrorism and Financial Intelligence.

Al Manar has employed multiple Hezbollah members. One al Manar employee engaged in pre-operational surveillance for Hezbollah operations under cover of employment by al Manar.

Al Manar and al Nour have supported fundraising and recruitment efforts by Hezbollah.

Al Manar raised funds for Hezbollah through advertisements broadcast on the network and an accompanying website that requested donations for the terrorist organization.

As recently as late 2005, Hezbollah-affiliated charities aired commercials on al Manar, providing contact information and bank account numbers for donations.

Moreover, Hezbollah secretary general Hasan Nasrallah publicised an invitation for all Lebanese citizens to volunteer for Hezbollah military training on al Manar and al Nour.

In addition to supporting Hezbollah, al Manar has also provided support to other designated Palestinian terrorist organizations, including the Palestinian Islamic Jihad (PIJ) and al Aqsa Martyrs Brigade, notably transferring tens of thousands of dollars for a

PIJ-controlled charity.

PIJ is listed as a Specially Designated Global Terrorist and a Foreign Terrorist Organization by the US Government, and is also named on the European Union's list of terrorist entities.

Nasrallah, along with Hezbollah's executive council, managed and oversaw the budgets of al Manar and al Nour.

The action prohibits transactions between US persons and the designated entities and also freezes any assets they may have under US jurisdiction.

The Coalition Against Terrorist Media (CATM) praised the US Treasury Department.

"Today's action gives the government the tools it needs to cripple al Manar's broadcasts, which spread the Iranian regime's propaganda, support terrorism, recruit suicide bombers, and incite violent attacks," said Mark Dubowitz, COO of the Foundation for Defense of Democracies, which

founded CATM.

"We congratulate the federal government on providing the means to aggressively pursue al Manar and those who do business with it.

"Otherwise, the pursuit of al Manar becomes a game of Whack-a-Mole where every time you take it off of one satellite provider, it pops up on another."

Since its founding in 2004, CATM has met with more than 800 government and private sector officials around the globe urging action against al-Manar.

CATM has been instrumental in removing al-Manar from eight satellites broadcasting into North America, South America, Europe, Asia, and Australia.

Two satellites continue to broadcast al Manar - Arabsat, majority-owned by the government of Saudi Arabia, and Nilesat, whose largest shareholder is the government of Egypt.

These satellites reach the Middle East, Europe and North Africa.

Tandberg Television assists China's HDTV roll-out

Tandberg Television is providing the professional video compression systems to enable China's first national high definition television roll-out.

The new HDTV service, the first of its kind in China, features movies, TV series, documentaries and three-dimensional animated pictures.

With the upcoming 2008 Olympic Games in Beijing already being hailed as the 'High Definition Games',

the Chinese government has set a deadline of 2015 for the culmination of the country's mass migration to digital TV and the nationwide switch-off of analogue broadcasting.

NDT, partner of the country's largest broadcaster China Central Television (CCTV), selected Tandberg Television to provide an MPEG-2 head-end system which it has been trialling over the past six months.

Following these successful trials, the service is now being rolled out nationally and is already being used by CCTV to provide HDTV to multiple digital cable head-ends across China.

The HD video delivery system is based on the Tandberg E5780 MPEG-2 HD encoder.

"Our relationship with Tandberg Television spans over 8 years of successful collaboration. Today we are



working closer than ever in order to harness its technology lead to provide complete HD coverage across China," says Andrew Lo, CEO of NDT.

50 years ago

By Keith Wilson

After missing two issues, in May 1956 *Practical Television* was back on the newsstands, albeit with a swingeing 25% price increase from 1/- to 1/3 (5p to 6.25p).

The cover feature was clearly designed to have broad appeal – TV for Beginners.

Strangely enough, although I did my City & Guilds Radio and Television servicing course back in the days of turret tuners and valves, I really do not have any recollection of classrooms like the cover illustration of *Practical Television's* May 1956 issue.

Did people really wear suits for training sessions in those days? Someone must remember.

The series of articles to which the cover refers were attributed to none other than FJ Camm himself, the editor of this and many other *Practical* titles.

May's instalment was, in fact, the second in the series, despite the impression created by the cover.

Bizarre

It dealt, logically enough, with cathode ray tubes, but the choice of material presented is somewhat bizarre.

It is interesting to know that the air pressure on a 17" tube amounts to around 1.5 tons, and very sobering to think what the equivalent figure is for some of the more recent monster CRTs.

But how is going to help you to service televisions by knowing that zinc sulphide, when activated by silver and used as a CRT phosphor, produces a deep blue glow?

Or even that the tube's cathode coating is quite likely to be barium-strontium carbonate with a trace of calcium?

This is the beginners' guide remember – what must the advanced version have been like?

Equally strange are some of the omissions. There is a nice illustration of the bent gun assembly for an ion-trap tube.

The caption even states that it is from an ion-trap tube, but nowhere are ion traps mentioned in the article itself.

Given that misplaced ion trap magnets were once a common cause of no-picture symptoms, surely they might have been worth a word or two!

Perhaps our author was beguiled by the advertisement for GEC aluminised tubes, which appeared on the back cover.

Not only were these the new rectangular shape, they also didn't need ion traps because they had aluminised screens.

The advertisement claims a 70%



In the classroom, smart dress will be worn at all times!

increase in picture brightness, giving high contrast daylight viewing, as well as, of course, complete freedom from ion burns.

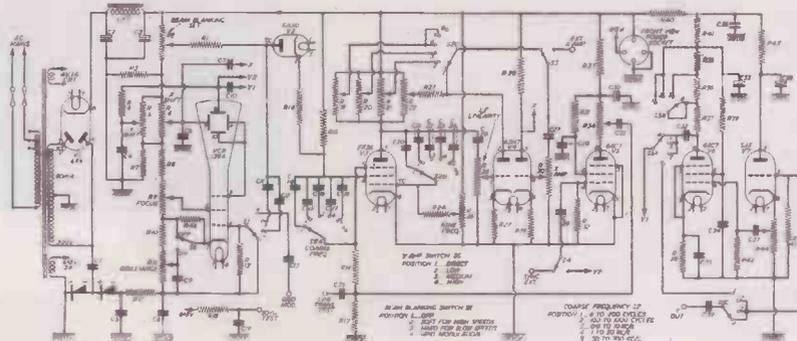
These benefits, however, had a fairly steep price tag - £14/15/0 plus £6/18/1 purchase tax - and we complain about 17.5% VAT.

Profitable business

To put this in perspective, the total price equates to about £900 in today's money, based on relative average earnings. No wonder servicing was a profitable business in those days.

In 1956, *Practical Television* was, as its name suggests, a very practical magazine. The major constructional project in the May issue was an oscilloscope specifically adapted for television servicing.

The principal adaptation was a terminal, which allowed pulses from the timebase to be used to shock excite a line output transformer, without removing it from the set.



The practical project – an oscilloscope for TV servicing

By using the 'scope itself to observe how heavily damped the resulting oscillations were, it was, according to the article, possible to decide whether the transformer had shorted turns.

Inevitably, the 'scope was built around one of the government-surplus CRTs which were, at the time, readily and cheaply available.

The type chosen was the VCR139A, which the October 1955 issue of PTV describes as having a 2.75" screen and a medium



This Convertable by McMichael consists of a Band III converter upon which the receiver may be stood.

A real must-have: the McMichael Convertable

persistence phosphor – activated zinc sulphide, no doubt.

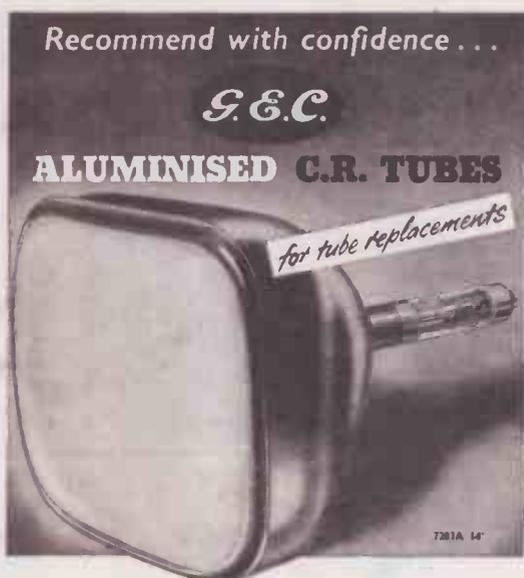
The maximum recommended EHT is 1.5kV, but there's a note that, in the services, it was operated at 2.5kV when its life was "comparatively short and gay". The mind boggles.

As always, the new products pages produce some interesting items, including the Adaptorod aerial conversion system.

Little more than a metal rod joined to a spring clip, this is claimed to clip onto a Band I dipole and allow the efficient reception of Band III signals. Maybe it worked – until the first really windy day, that is.

The award for the most unusual product in this issue, however, has to go to the McMichael Convertable. No, that is not a spelling mistake – the Convertable is a table to stand a TV on, but with a Band III converter built in.

As the write-up proclaims: "By this unique method, only a few minutes are needed to transform



GEC's brighter CRTs needed no ion trap.

your set into an all-band model and, at the same time, add to your home a piece of furniture."

Not an elegant piece of furniture, you will notice, nor even a useful piece of furniture – just a piece of furniture.

The temptation to rush out and buy must have been almost irresistible.

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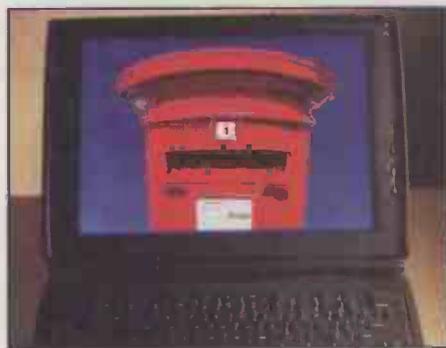


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Please send letters to Television, Nexus Media Communications, Media House, Azalea Drive, Swanley, Kent, BR8 8HU

Email – TVeditor@nexusmedia.com
using subject heading 'Television Letters'

Ekco U29 small table set

I have just finished reading Chas Miller's article on refurbishing an Ekco U29 radio (March 2006 issue), and found it, as always with his articles, an entertaining and informative read.

However, I feel that I must take issue with him over his cavalier dismissal of the variac as a valid tool for safely working on high-voltage valved equipment.

Far from being 'a curious device', the variac is a useful workshop tool in the right hands, and those of us who do use one for such work, are certainly not 'addicted' nor would consider ourselves 'quaint'.

Rather, I contend that we are being responsible, both in terms of our own health and safety, and that of those working around us.

While the rectifier valve employed in this particular set may require virtually its full nominal heater voltage to get into emission, this is by no means the norm.

Many items of valved equipment, use thermionic rectifiers with much greater emissive efficiency than the CY1 or CY31, while many others use various types of solid state rectifier.

Perhaps Mr Miller has never seen the effects of an exploding electrolytic, first-hand. I have, and it is not a pretty sight.

When I was an apprentice, many years ago, a colleague experienced such an event, from a television chassis that he was working on.

As a result, he suffered quite serious burns to his face and hands, and was lucky not to have lost his sight.

While Mr Miller's technique of just plugging in and tuning for maximum smoke may be the 'man's way' of doing it, I would seriously advise and urge any readers who are would-be valve equipment refurbishers, to do the sensible thing, and look after their own safety, and that of those around them, by using appropriate

of variac-less servicing I have seen cases of an electrolytic condenser exploding with some force – two in fact – but neither could have been attributed in any way to a failure to use one of those questionable devices.

In the first case, which happened around 1955, the condenser in question was a 25µF, 25V working (VW) bias type in a set that had been working on test

normally for some

hours before it

failed.

In the second

incident, more

recently at only

about twenty-five

years ago, the

condenser was an

HT smoothing

type rated at

16µF, 350VW that

again had been

functioning normally

for some time before

going bang.

Both explosions were reasonably spectacular and might have caused damage to someone looking directly at the condenser but ever since that first incident I have made it a rule never to have the seal end of a condenser pointing towards me when working on a set.

I have emphasised the wisdom of this practice to all the many people who have attended *Radiophile* teaching workshops.

Harking back to Geoff's unfortunate colleague, there is insufficient data for one to form an opinion as to why the condenser exploded but I am prepared to bet my bottom dollar that the use of a variac would not have prevented it.

In the course of my career I must have plugged in some tens of thousands of radio and television sets but never, repeat never, have I experienced a reservoir or smoothing



repair methods, and the workshop equipment to back that up.

Old electrolytics which, after languishing in the garden shed for ten years, suddenly have full voltage put across them - and I don't care how long Mr Miller's rectifier takes to produce output, it's still 'sudden' in real terms - are very likely to fail, catastrophically.

Be warned ...

Geoff Darby, Proprietor, Monitech.

Chas Miller replies:

I have read with considerable interest Geoff Darby's comments on my opinions regarding variacs.

Yes, Geoff, in over fifty-five years

condenser exploding as soon as HT was applied to it. Neither, for that matter, do I know anyone else who has had this happen.

Thus I simply cannot accept Geoff's assertion that when "[old] condensers suddenly have full voltage put across them...[they] are very likely to fail catastrophically."

This experience has not happened to me, Geoff, since I entered the radio trade in 1948. How many times has it happened to you?

Please let us know so that we may judge if you are entitled to tell people to "be warned".

It would also enable readers to make up their own minds as to whether your unspecified "appropriate repair methods" are superior to those I have been using successfully since probably before you were born.

The fact of the matter is that for a condenser to explode its electrolyte would have to come to the boil and exert great pressure, which would take some time to develop.

Long before this stage was reached the condenser would have been emitting warning signs by becoming warm to the touch or making slight hissing sounds, and the sensible engineer will, after any set has been put back into service after any interval, be it twenty-four hours or twenty-four years, be looking out for these symptoms before anything drastic happens.

However, the condenser would have had to be subject to its normal working conditions for the trouble to commence and this is where reliance on variacs falls down.

In fact, their use flies in the face of all accepted methods of testing any kind of electrical or mechanical devices; normally these will be subjected to voltages or stresses far in excess of their ratings and if they are able to stand up to this treatment they may confidently be considered to be safe in everyday service.

It would appear to me that the variac user stands this principle on its head and blandly assumes that if a condenser will function without blowing up at well below its working voltage it will be perfectly safe when the latter is applied.

Geoff may believe this if he wishes but if he thinks that the practice will protect him totally from exploding

condensers without taking the precautions outlined above, I fear that he is likely to have a very nasty surprise in store for him some day.

*Chas E Miller, Editor,
The Radiophile vintage radio magazine.*

What a life!

When I wrote the What a Life! Article that appears in this issue, I was unaware that it would be the final one, and consequently I was unable to bow out as was perhaps appropriate.

I began the 'What a Life!' series more years ago than I care to remember, and during its run I received hundreds of letters, most of them from readers at home, but scores from all over the world – some from places I'd never heard of.

A vast number of the writers became firm friends, and still write to me, not **only** about matters electronic, but with family news and all sorts.

I hope that these folks will continue to keep in touch, for while the time has come for 'What a Life!' to end, its scribbler totters on...

Memories? I recall the disgruntled dealer from up North who wrote me a humdinger many years ago about some view I'd advanced.

I apologised for inadvertently offending him, and he replied thanking me, and followed with an outline of his business and its customers.

He's still writing to me today, having shared his falling business fortunes and enjoined me in the tragedy of his wife's untimely death. He is currently telling me of his own hospital visits.

I recall, too, the Australian reader who called me to task for slating the Australian accent.

He called me 'DFB', and I assumed he was simply using my initials, but he was to confess, much later, that when he first admonished me, he intended the first letter as a reference to my unwashed state, and the third referred to my parentage.

I expressed no curiosity about the middle letter, but immediately assured him that I wasn't fat...

His letters accompanied me through the break-up of his marriage, his finding and marrying a new partner, his resultant bliss, and, before long his sad news that he had just returned from her funeral.

Then there was the New Zealand engineer who found time to write to

me and continued even when he became very ill.

'How are you doing?' I asked him in one Email. A minute later my telephone rang. It was him.

'Let's put it this way,' he said. 'I'm going to see this coming Christmas, and the next.' Later, he told me in one Email 'I am writing this in sessions.' It was his last letter.

Dozens of dealers have assured me for years that the characters who assailed me also showed up in their shop, and one, from, I think, Halifax had threatened to call the police to Mrs Rabble, who had shown up at his shop under a false name and kicked at the sets on a low display plinth.

She was the lady who loudly rebuked her scruffy daughter for jabbing her lollipop at another customer's overcoat.

"You'll get all hairs on it, you silly swine," she'd bawled.

A few readers advanced the view that I painted some of the characters larger than life.

What they couldn't know is that some were too indelicate to quote in print, and others were so outrageous that I was sometimes had to play down their behaviour to bring them into the realms of credibility!

Anyway, it's been very pleasant indeed to have been part of the *Television Technical Fun Club* for so long.

I've been in wonderful company and I'm sure it's kept me young. But everything (and everyone) has a 'Sell by' date, and 'What a Life' could be no exception. I still have my pen, for scribbling out and sending in some Fault Reports.

Now for the sad bit, of saying goodbye. I would like to sincerely thank all those who took the trouble to read the column over the years, and to those who wrote to me, telephoned me, and dropped in on me in England.

And those who took the trouble to look me up in my Spanish home, too, and suffered my cheap wine and ancient jokes.

I'd like to thank my wife Jeannette, too, who as 'Greeneyes' kept me in order – or somewhere near it.

It has all been very good fun for me, and, I hope, for you. What more can I say than 'What a Life!'

*Donald Bullock
donald@wheatleypress.com*

Planet Earth goes HD



The world's premier wildlife cameramen travelled all over the planet to create the series.

BBC Post Production in Bristol was responsible for the HD editing of the landmark series Planet Earth narrated by David Attenborough, the BBC's first major HD series which began transmission on BBC One on 5th March.

From the world's greatest rivers and impressive gorges to the mightiest mountains, the hidden underground world of caves and caverns, to vast deserts, Planet Earth gives a unique view of awe-inspiring landscapes from all across the globe, revealing some of the most mythical creatures that live in these habitats.

The world's premier wildlife cameramen travelled all over the planet to create the series.

It would not have been possible to film many of the breathtaking sequences without high definition cameras.

The high definition cameras were able to slow down the action by over 40 times enabling us to see crocodiles dive out of the water to snap their jaws around wildebeest.

Cameras were able to track not only the great migrations but to capture split-second action and get an amazing footage of land-based animals in their natural territories, however remote their habitat.

BBC Post Production in Bristol invested in a new High Definition tapeless post production solution to support the series.

The new grading and finishing technology, which included substantial data storage to eliminate video tapes, enabled BBC Post Production Bristol to deliver high quality content.

Sledgehammer

The ingest, storage, editing, effects, grading and archive systems is based around a 9TB Sledgehammer NAS and includes Lustre and Smoke.

Transferring the material presented a number of challenges. Three years ago the formats used were relatively new and required significant development to ensure that wildlife filmmakers could maximise the cameras output.

The key issues were ensuring that all the variables within the different formats could be dealt with.

For example, although the programme was produced at 25p, the

process had been changed to deal with variations such as slow motion shots.

The use of the revolutionary new logging system Colledia proved invaluable for the producers of Planet Earth, enabling them to produce storyboards and rough cuts to produce a pre-edit.

The key issue for the ingest was to ensure that all the metadata was downloaded into the system to produce meaningful files for batch digitising.

In order to retain the highest quality from the film material, initial offline copies were made and then selected shot transfers at RGB 4:4:4 were ingested onto a timeline in the Sledgehammer.

Video rushes were conformed directly into an HD smoke and then married up with the film rushes.

The creation of both EDL's were a massive undertaking, due to the sheer volume of rushes and archive within the programmes.

Due to the tapeless nature of the system, all conformed material was stored as data DPX files.

This enabled transfer of the material back and forth throughout the Smoke/Lustre/Sledgehammer, without affecting the quality of the material in any way.

Alastair Fothergill, Executive Producer Planet Earth commented: "The detail HD gives is incredible. The Planet Earth footage is of the highest quality and totally unique."

"We wanted to be able to preserve the quality of the content whilst also achieving an efficient, non-linear, data-based and cost effective route through post production."

"The solution BBC Post Production Bristol has provided meets all these needs."

Flashmob

Following in the footsteps of the award-winning 'Flashmob: The Opera', BBC Outside Broadcasts captured Manchester Passion on Good Friday for BBC 3.

The live event offered a contemporary re-telling of the last few hours of Jesus' life using popular music from the cream of Manchester bands, from Joy Division to The Smiths and Oasis.

Flashmob: The Opera and Brand New Flashmob Opera, which won an award in March, involved BBC Outside Broadcasts recording live multi-camera operas at Paddington station during rush hour and at the busy Meadowhall shopping centre.

Working with performers, musicians and public crowds across the city for Manchester Passion was

equally as challenging for the production team.

A procession through the city centre culminated in Albert Square, where members of the public were encouraged to join in the singing of classic pop anthems, including the M People hit 'Search for a Hero Inside Yourself'.

Sound engineering was complex, as the singers competed with the noise of traffic and crowds.

Steve Chapman, BBC Outside Broadcasts' lead engineer manager, coordinated a crew of around 45 people, including camera supervisors, sounds supervisors, vision engineers, communications engineers and riggers to support BBC Classical Music.

Steve has worked on the previous FlashMob Operas and was recently in Melbourne, Australia, delivering coverage of the Commonwealth Games.

Steve says: "Manchester Passion is another wonderful and ambitious idea created by a daring production team."

Multi-camera operations

"Our crew is becoming very experienced in live multi-camera operations in difficult broadcast environments."

Nine radio cameras were split between the main production area in



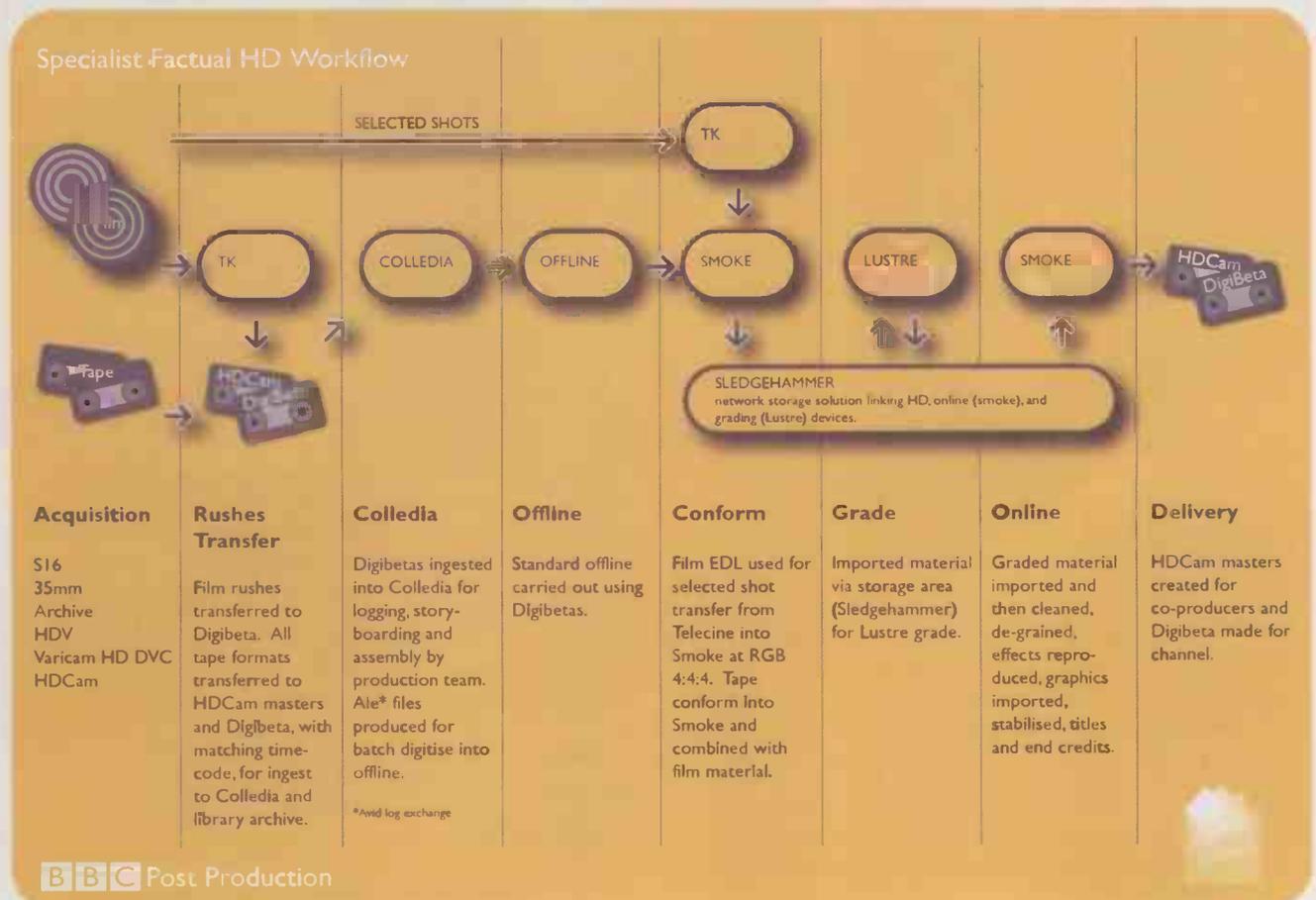
Cameras were able to get an amazing footage of land-based animals in their natural territories, however remote their habitat.

Albert Square and other sites, plus six cabled cameras, including two Jimmy Jibs. There were also further cameras situated along the procession route.

BBC Outside Broadcasts' large multi-format production truck, Unit 12, was situated at the front of the Town Hall in Albert Square, where two stages were built, one for the orchestra and one for the presenters.

A smaller production unit, BBC Outside Broadcasts' Unit 25 truck, was also used to cover the action in the secondary area.

BBC Post Production London won the post production work on the second series of Strictly Dance Fever, which aired on BBC One in April 2006. It used its new logging tool Colledia for Production for enhanced clip research.



Presented by Graham Norton, *Strictly Dance Fever* saw some of the UK's most talented non-professional dancers strut their stuff on the dance floor, as they competed for public votes and a £50,000 prize award.

After nationwide regional auditions, ten couples were chosen to live together and learn a new dance routine each week from a variety of dance styles – from Argentine Tango and Salsa to Lindyhop.

Dance off

As with the previous series, there was a live Saturday night dance off, which saw one couple eliminated each week.

The production team needs fast access to a large volume of material, right up to the point of transmission, particularly because the programme draws on lots of behind-the-scenes content.

BBC Post Production's new sophisticated ingest and logging tool, Colledia for Production, developed by Siemens Business Services, enables the production teams to research and locate clips quickly.

Colledia for Production was used by BBC Post Production on the

It would not have been possible to film many of the breathtaking sequences without high definition cameras.



highly successful third series of *Strictly Come Dancing* and the recent new series *Just the Two of Us*. It can also be used to storyboard and assemble rough cuts.

BBC Post Production London is providing full facility support for *Strictly Dance Fever*, including edit suites, a logging suite, production office and library, all situated in BBC Post Production's Edit Facility, based on the fourth floor at Television Centre.

Twenty five post production staff support the project, including editors, edit assistants, loggers, engineers and runners.

BBC Post Production delivers a mix of offline edits, symphony onlines and grades, some of which may be operating on a 24-hour basis over transmission weeks.

Winning post production on the second series *Strictly Dance Fever* follows the successful post on series three of *Strictly Come Dancing* in the autumn.

Strictly Come Dancing series three Producer Paul Golding says: "BBC Post Production offered complete support for the series and was flexible enough to cope with the ever changing nature of the programmes, with lay-offs often

BBC Resources

BBC Resources is one of the largest production facilities businesses in the UK and was the first of the BBC's commercial business-to-business subsidiaries to be incorporated, in 1998.

BBC Resources offers a comprehensive set of services in the outside broadcast, studios, post production and costume and wig hire markets, combining extensive experience with award-winning talent and expertise.

BBC Resources has an annual turn of over £130 million and employs around 1300 staff. The size and depth of the company's resources enables it to handle even the largest-scale projects.

Major broadcast events BBC Resources recently facilitated include Wimbledon, Live 8, Glastonbury, Athens Olympics, Euro 2004, and *Children In Need*.

With a focus on innovation, BBC Resources continually looks to produce technological 'firsts' from ground-breaking cricket stump cameras to virtual reality capability.

BBC Resources is made up of four key businesses: **BBC Outside Broadcasts**. The leading outside broadcast facilities provider in Europe, offering a complete range of solutions from scanners and VT units to design of bespoke OB production units.

Combining creativity and flair with technical expertise, project management and customer service skills, BBC Outside Broadcasts caters for both small and large scale events across all genres. Key clients include BBC Sport and independents such as North One, TWI and MTV.

BBC Post Production. Located in London, Bristol and Birmingham, BBC Post Production offers award-winning creative solutions using the latest technology.

BBC Post Production facilities are the largest of their kind in the UK. Its extensive range of services includes editing, audio and telecine.

Using the most up-to-date technology in comfortable and inspiring surroundings the team bring talent and experience to a range of productions, trailers and promos.

BBC Studios. Located at Television Centre in London and Elstree, the 17 studios accommodate many of the UK's favourite TV programmes.

The studios, which are famed for being at the forefront of technical innovation, are equipped to the highest standard and staffed by crews with extensive experience. From the latest cameras with widescreen capability to the provision of ample space for prop storage and scenery, BBC Studios has been designed to enable maximum flexibility and swift set turnaround. **BBC Costume and Wigs**. A collection of over a million costumes and more than 12,000 wigs and hairpieces, searchable via computerised database, is available to the TV and film industry and is frequently used in hundreds of productions both large and small each year.

Skilled and friendly staff is on hand to offer expertise and advice on costumes and wigs. Specialising in contemporary stock, it is a one-stop-shop for any production.

For more information visit www.bbcresources.com



Cameras were able to track the great migrations

being pushed right up to transmission.

"The Colledia for Production system was fast and user friendly, enabling us to create as simple or as precise an EDL as we needed.

"Crucially, Post Production enabled us to meet tough deadlines without compromising on creativity."

BBC Post Production's experience of working in high definition extends across drama, entertainment, natural history and sport, as well as short films and includes working for both UK and international broadcasters.

It offers a range of services which are HD capable from sites in London, Bristol and Birmingham and can fulfil requirements from graphics and editing to grading and re-mastering.

Bespoke solution

With an extensive range of HD post production facilities, it can ensure that the best bespoke solution is offered to match budgetary and programme requirements.

Services include:

- HD Editing
- HD Telecine/Grading
- HD Graphics
- HD Conversion
- HD Restoration
- HD Storage
- Multichannel sound

HD Editing

HD Editing facilities include Adrenaline MediaComposer, which is offline/online capable, offering a variety of compressions ratios from 1:1 (uncompressed) to 20:1 (heavily compressed) and native DV.

All resolutions can be mixed in the timeline. In addition, it can offer high quality HD without the storage

costs of uncompressed HD.

Final Cut Pro, the editing system for Apple Macintosh, which has been featured recently in *Television* magazine, can be scaled to HD. It delivers powerful, precise editing tools that work in almost any format.

Features include a real-time multistream effects architecture,

multicam editing tools, advanced colour correction and intuitive integration with other Apple professional video and audio applications.

eQ is an uncompressed, non linear editing system by Quantel. eQ offers uncompressed online finishing for programmes that need to be

Steve Jamieson, HD on-line Editor for BBC Post Production, London

Steve is HD on-line Editor at BBC Post Production and has been a key player in the build of their HD facilities. He works on a number of HD programmes across various genres for both UK and international broadcasters.

Tell us about what you do? I design, operate, maintain and develop the HD online systems for BBC Post Production and advise on HD post production related matters.

What can the eQ achieve and why should I use it for my HD projects? The eQ is one of the most powerful HD online and finishing systems currently available. The uncompressed storage system works at many frame rates and resolutions and delivers an image quality of the highest possible standard.

What other HD editing tools have you available? We have a full range of facilities, including caption adding facilities, clean-up, restoration and FX tools. In addition we have an Avid HD Adrenaline finishing suite providing a high level of compatibility between our offline and HD online areas. Our facilities are interconnected for maximum flexibility and are constantly being developed to take full advantage of current and future HD post production requirements.

When working in HD what are the additional things that you need to take into consideration before post production? The "HD" label is used to describe a huge range of format variations. It is vital that the delivery format is determined before any shooting begins. If in doubt, consult!

What HD projects have you been working on lately? Recent HD post production projects that I have worked on include 'The Undertaker' for BBC Films, 'Love Soup', 'Last of the Summer Wine' and the 'Live 8' DVD.

What are your HD predictions for the future? A continued increase in demand for HD post production, once a viable HD delivery system becomes generally available.



delivered in HD and SD.

From the first conform to final mastering and versioning the eQ combines powerful editing, effects and colour grading tools with 'resolution co-existence'.

Fire is an uncompressed, high-end, non linear editing and finishing system, used for complex effects, powerful colour correction, motion tracking and plenty more.

Smoke is a non-linear uncompressed 10 bit system which retains all the functionality of Fire. It is SD/HD capable for finishing work and grading.

Symphony Nitris is an HD capable version of Avid's non-linear editing and finishing system, with powerful colour correction and grading/styling ability and DVE functionality.

It is capable of working with compressed (DNxHD) or uncompressed HD formats.

HD Telecine & Grading

The Lustre is a non linear system, which provides all the functionality of a standard grading platform with the advantages of a high-end effects system. The Lustre has a powerful

Planet Earth gives a unique view of awe-inspiring landscapes from all across the globe.



secondary colour correction capability.

The Pogle is a grading system for either film or video and enables high quality matching between shots and scenes. It is capable of both primary and secondary colour correction.

The HD Shadow is a telecine system designed specifically for television production and is capable of scanning at both SD and HD.

The advanced CCD scanning technology and all-digital design

ensure both high quality and reliability.

The HD scanning is recorded straight into the Sledgehammer NAS at RGB 4:4:4

Spirit is a multi-format (16mm, S16mm, 35mm, S35mm), multi standard (601 SDTV, HDTV and 2k data) line array CCD device with primary colour correction.

Alchemist Platinum is Snell and Wilcox's premier Standards Converter. It uses unique technology to upconvert archive material for HD programmes.

HD Restoration

DVASC reduces or eliminates the appearance of film grain, dirt & sparkle.

Scream is an accessory to Spirit for film grain reduction, essential for Super 16 use at HD.

Scratchbox is a hard-disk recording system that uses a pen and tablet to allow precise, rapid de-spotting.

Sledgehammer is a network storage solution linking HD, online (Smoke), and grading (Lustre) devices.

Allowing play into the system from HD Telecine and upconverter, it gives a complete HD tapeless solution, only using tape as a medium for delivery. Unity is a shared storage solution from Avid, now capable of handling HD through its DNxHD compression standard

Multichannel Sound

5.1 Audio Multichannel audio technique is applied to major feature films and DVDs.

This is now more common on HD programming particularly for delivery to overseas broadcasters. It is likely to become standard requirement in future UK HD premier productions.

Phil Mead, Facilities Manager, BBC Post Production Bristol

BBC Post Production in Bristol work on a diverse range of projects from natural history to fast turnaround daytime programmes. The HD revolution has seen the department working on such landmark programmes as Blue Planet and the remarkable latest series Planet Earth.

What does your role involve? As Facilities Manager I'm involved with customers developing long and short term strategies to ensure their programmes are post produced in the most efficient and cost effective way.

Tell us about the HD work that your department deal with? We have experience in all the current HD formats (HDCam, HDDVC Pro, and HDV) and have just installed the first tapeless online solution in the country which uses a Smoke online editing device and a Lustre grading system integrated to a central storage and archiving system.

What HD projects have you worked on recently? We have worked on and are supporting a number of HD projects including the BBC's landmark series, Planet Earth and the forthcoming Galapagos and Natural World. We have also worked on a number of corporate HD projects and the BBC drama Pride.

What companies have you been working with? We work with a number of production companies including the BBC, John Downer Productions, Diverse, Tigress and Aardman.

What is the best thing about working at BBC Post Production? Having access to one of the greatest talent bases in the country and being able to draw on that wealth of experience.

Claim to Fame? Consulting on the movie Deep Blue. Taking Mini DV to the big screen was a real achievement.

What do you do in your spare time? Spare time, what spare time. With two kids and a great job I don't have much spare time!





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Ousting the cowboy aerial installers

A Government-backed scheme to provide an army of trusted, qualified engineers who will help enable the UK's switchover to digital television was launched in March by the Rt Hon Alun Michael MP, Minister for Industry and the Regions. Boris Sedacca reports from the House of Commons.



A scale model of the vehicle to be used for a road show to promote the switchover was displayed at the House of Commons.

Thousands of aerial engineers are expected to apply to become a Registered Digital Installer (RDI), meaning that those consumers who need their aerial upgrading in order to receive digital TV have a trusted source of advice.

The aim of the scheme is to create a gold standard for the aerial industry and help drive out 'cowboy' operators.

Under the RDI scheme, engineers will be awarded the 'digital tick' certification mark if they obtain a Level 2 National Vocational Qualification in Electrical and Electronic Servicing, undertake criminal records disclosure and have public liability insurance.

Alun Michael said: "The successful training of the first group of registered digital installers has been achieved through partnership working by the DTI, industry and a network of colleges offering NVQ courses for digital TV installers.

"This qualification will ensure that these registered installers carrying out the work have the right skills needed to ensure that switchover will be done well and on time.

Poor image

"It will also raise standards and improve the overall perception of an industry that, at times has suffered from a poor image."

He presented the first RDI award to Raymond Bridge of Active Aerials & Systems. Other recipients included Peter Chester of Bradshaws, Ashley Creswell of Upgrade Services, Ian Reynolds of MBC, Carlton Smith of AAS (Midlands), Christopher Tonks of Wednesbury & Darleston Aerial Services, and Anthony Jones of AB Jones TV.

Ford Ennals, chief executive of Digital UK, added: "We intend to maximise awareness of this scheme through our marketing and free digital helpline.

"Digital UK will promote the qualification by advising viewers to seek professional assistance from recommended digital installers who display the digital tick."

Qualified installers are expected to benefit from increased business, because the public will be assured that those with the RDI certificate are the best source of help and advice on aerials during switchover.

The scheme will be administered

by the Registered Digital Installer Licensing Body (RDI-LB).

Bill Twigg, chair of the RDI-LB, said: "This scheme is the result of collaboration between a range of bodies including SEMTA and the trade associations, to produce a skilled and reliable workforce which the public can rely upon during and following the switch to digital."

The DTI has worked closely with the Sector Skills Council, SEMTA and the aerial installer industry trade associations - the Confederation of Aerial Industries (CAI) and the Independent Digital Standards Commission (IDSC) - to develop a suite of national qualifications, including the RDI Scheme, in order to raise the professional status of the industry and reassure the public during switchover.

Enduring legacy

The RDI qualification is designed to be an enduring legacy of switchover, benefiting the aerial-installer industry long after analogue switch-off is complete.

In the longer term, apprenticeships will be available to attract high quality people into the sector.

Mike Hughes, broadcast director at

Alun Michael MP (right) presents the first award to Raymond Bridge of Active Aerials & Systems.



Digital UK, said: "Digital UK is delighted to have this opportunity to welcome and endorse the Registered Digital Installer scheme.

"As most of you probably know we are the organisation co-ordinating digital switchover in the UK.

"We are on track and the preparations for switchover in the period 2008 to 2012 are going well.

"Digital UK has two main tasks – co-ordination of the transmitter re-engineering programme and communicating the process to viewers.

"We have already been active in the Border region with marked success in raising levels of awareness and understanding of the Switchover process."

According to Hughes, the latest research shows awareness in Border at 88% compared to nationally at 66%.

Hughes continued: "The launch of the RDI scheme marks another important step in bringing together the various industries that need to work together to make DSO as positive a process as possible for UK households. It confers a new level of credibility on the aerial installers industry.

Digital 'tick' logo

"Accredited installers will be able to display the same digital 'tick' logo that accompanies Digital UK's communication campaigns and which is being increasingly used by manufacturers and retailers as part of the assurance to viewers that reception equipment is designed to continue to work after switchover.

"Arguably, it is one of the first positive tangible spin offs from switchover, without which the scheme would probably not have emerged.

"The public will be reassured by Digital UK that installers who hold the RDI certificate are a reliable source of help and advice on aerials leading up to and during switchover.

"This will remove one of the major areas of concern for households and, hopefully, go a long way to dispelling

some of the unfavourable impressions about the industry that linger in some quarters.

"Digital UK looks forward to seeing the scheme in action. We are committed to supporting it in our communications and we urge all bona fide installers to enrol for and achieve the qualification which will allow them to display the digital tick with pride and should open up real business opportunities for them."

The logo will act as a professional 'Kite Mark' for Signal Reception (aerial) Installers.

RDI-LB is a community interest company, formed to encourage the raising of the professional status of aerial reception installers and the aerial reception industry as a whole.

All aerial installers believe themselves to be professional engineers providing a quality service to the customer in an industry often perceived as being beset by 'cowboy' elements.

The Registered Digital Installer Scheme is designed to raise the professional standards (and perception) of the industry in the eyes of the general public and corporate customers.

This will be done by authenticating, through the Licensing Scheme, Installers who have proven their competence, reliability and suitability by meeting the Licensing Body's criteria for Registration. The Public will be advised to look for and use Registered Digital Installers.

The RDI - LB has the responsibility for awarding RDI Registrations to Installers who meet the following criteria:

- Level 2 NVQ/SVQ in Electrical and Electronic Servicing (Signal Reception) Pathway
- A satisfactory Criminal Records Disclosure
- Appropriate Public Liability Insurance

A network of colleges offering the NVQ in Electrical and Electronic Servicing (Signal Reception) Pathway is being established.

Up-to-date lists can be found on the Trade Associations websites, or installers can contact the CAI or IDSC directly.

They can call the college serving their region who will advise on how to get started and the possible funding support available.

For more information about NVQ's see RDI -LB Information leaflet 'National Vocational Qualifications'.

Criminal Records Disclosure

When registering for the NVQ, the installer will be asked to complete and forward an application for a 'Criminal Records' Disclosure.

Meeting this criterion is of particular importance to give reassurance of his reliability and suitability to customers, whose homes he may have to enter in the course of installation work.



Mike Hughes, broadcast director at Digital UK: "The public will be reassured."

NVQ. The Licensing Authority for the RDI scheme will have to become self-sustaining in the longer term and as with any 'Authority' such as this a fee will be set for registration as an RDI.

Graham Althorpe, managing director of STMicroelectronics, claimed his company designed the world's first single-chip analogue STB in the early 90's.

"From ICs designed in our Bristol and Grenoble France R&D centres, our Marlow office invented what was to become the FreeView set top box," he said.

Digital switch-on

"Over half of all FreeView boxes contain our IC's. Most people talk of analogue switch-off, when we should be talking of digital switch-on.

"Let me take you back to the conversion of the analogue telephone lines. There are many analogies. The system still sent the spoken word, as digital TV will still send a picture.

"But 20 years on, the spoken word is a minority use of the digital telephone platform. It is the countless added value services based on data transmission that influence and enrich our lives today.

"That same explosion of services is beginning to occur, and will accelerate with the widespread digitisation of the TV in the home.

"Services such as electronic service guide providing eight-day viewing information, telemedicine, remote security and monitoring, metering and many more are yet to be considered.

"But we should not forget that full digital switch on will also give improved reception across our nation, plus a massively enriched viewing experience in terms of content and number of channels.

"Therefore this digital switch on journey is not just a different way of receiving the television - it will impact our nation's way of communicating, trading and interacting with each other, with equipment and services in ways we can only dream about today

"STMicroelectronics, working with many different UK-located companies has been able to take a four-chip solution costing \$160 just for the components to a single-chip solution which sells to the public for less than \$60 in a matter of seven years, and we have yet to fully exploit what is called convergence."

Althorpe then held up a USB device, shown in the accompanying photograph.

"As well as being able to view free-

Public Liability Insurance is essential for all installer companies. Research undertaken by DT/DCMS shows that very few installers have received training on digital television installation and now the regulator, Ofcom, has set December 31 2012 as the backstop date by which all licensees will be obliged to stop broadcasting their analogue services, there is an urgency to raise the skill levels of the industry.

A range of partners including the IDSC and the CAI has been helping to develop this award, aimed at meeting the challenge while raising the professional standards of the installation industry by linking it to the achievement of competence based qualifications and a licensing system.

About eighteen months ago the Sector Skills Council SEMTA began the development of a range of competence-qualifications at levels 2 and 3 covering all aspects of digital television installation.

These are now complete and 'Electrical and Electronic Servicing' at Level 2 and 3 have received the approval of the Qualifications and Curriculum Authority (QCA) and are currently being developed by the Awarding Bodies for delivery through a range of Further Education Colleges and private providers of training.

Pool of installers

An essential part of the 'digital switch over' is a pool of competent and professional installers who have the knowledge, competence and experience to advise, guide and

install the required equipment to the very highest of standards.

Just as all equipment is being developed to exacting benchmarked standards of quality and capability, so installers are being provided with an opportunity to illustrate similar quality benchmarks of competence and professionalism as a Registered Digital Installer (RDI).

Such marques do not come easy, neither should they if they are to earn the respect of the industry and most importantly, the general public.

To become an RDI, the installer will be required to submit to the Licensing Authority a portfolio of evidence of meeting the RDI Criteria.

Prior experience

Installers with many years of experience will be able through their training provider, to claim accreditation of prior experience.

People entering the industry with no experience will be able to work towards the achievement of RDI status, but will not receive recognition until they have undergone the appropriate training leading to the achievement of the NVQ at a minimum level 2.

This does not preclude them of course from practicing, hopefully under the guidance of an experienced Installer.

The Level 2 qualification is supported by a vocationally related qualification offered by City and Guilds of the London Institute and will involve the successful completion of a 20-hour learning programme, providing the basic knowledge and understanding required by the Level 2

to-air services on a set top box it is also possible to buy a USB dongle device that is as small as a pen knife and fits into your PC," he continued.

"By plugging an aerial into one end of the device and the USB socket into a PC, and with the aid of some software, this device will allow your PC to become a digital television receiver."

Landlords

Some 10% of households in the UK live in private rented housing. A small number of these will have televisions as part of the furnishings, with many more having fixed aerials or access to shared communal aerial systems.

The national switchover to digital TV will therefore create particular issues for landlords and tenants in the private rented sector which represents up to five million viewers.

The National Landlords Association (NLA), the largest UK-wide membership organisation for landlords, has been following discussions on switchover closely.

"We are involved with Digital UK and the Department of Culture, Media and Sport, have contributed to good practice guides and were present for most of the Culture, Media and Sport Select Committee hearings in Parliament," says Richard Williams, policy officer at the NLA.

"In addition we have been involved in providing background on the private rented sector in respect of the initial stages of the switchover process in the Borders region.

"Our surveys have shown that 84% of our members nationally have some understanding of switchover but only 15% have a sound understanding.

"For many understandable reasons much of the debate about switchover has so far been led by broadcasters and industry.

"However we are concerned that as 2008 comes nearer greater attention needs to be given to how consumers and other interested parties can be involved."

With the private rented sector representing a large number of viewers, unless awareness and understanding is promoted among private landlords many TV screens could go blank as the analogue signal is switched off.

Many landlords may not have a full understanding of switchover or that it applies to their rented properties as well as their own homes.

In addition landlords are just as susceptible to being bewildered by

Graham Althorpe, managing director of STMicroelectronics: "As well as being able to view free-to-air services on a set top box it is also possible to buy a USB dongle device that is as small as a pen knife and fits into your PC."



cowboys as any owner-occupier. The first area of concern is in respect of aerials in individual houses.

Figures from the CAI given during the Select Committee hearings indicated that on the basis of experience with ITV Digital some 30% of aerials might require modification to function properly in respect of digital TV before analogue switch-off.

Ofcom estimates that this figure might be as low as 10% after switchover, but the Lanstephan-Ferryside trial has shown that some 20% of properties needed some form of modification to their aerials.

Awareness needs to be raised amongst landlords that the fixed aerials in their rental properties may need to be upgraded to receive DTT.

Many landlords already respond to tenant demand for digital TV or, particularly in the student sector, will have broadband and cable television already installed given the expectations of tenants.

Some NLA members have also installed satellite television in their rental properties. In the remainder of properties however, while landlords will respond to market demand from tenants and potential tenants, there may not be a realisation that action is required until switchover occurs.

Cluttering properties

Although landlords may not want tenants cluttering up their properties with satellite dishes or installing cable reception, whether a tenant can receive DTT is often seen as being a choice for the tenant, which therefore leaves the possibility of many tenants losing their TV reception on switchover.

"Schemes such as the Registered Digital Installer scheme are to be

welcomed as a useful protection for landlords and tenant in navigating switchover and as a source of advice," Williams added.

"Much greater consideration however needs to be given as to how the private rented sector will be tackled in terms of publicity and creating a broader understanding of switchover."

The second problem is similar to the first but relates to the provision of communal TV aerial systems. Most communal systems in the private rented sector will be in flats or bedsits.

Communal TV systems

It is likely that most communal TV systems will need upgrading (whether MATV or Integrated Reception Systems) to receive digital signals.

Given that this will require the agreement of the freeholder and all leaseholders or owners in a block in order to cover the costs through service charges, and also changes to the aerial, processors and cabling to individual units of accommodation, much more complex work will be required than for single houses.

Guidance from Digital UK, in association with the Department of Culture Media and Sport, with input from the NLA, has been produced for managers of such properties but much needs to be done.

Landlords are in the business of renting property and are therefore not experts in digital TV installation. Further clear advice and guidance on the sort of work that needs to be done and the options available to landlords is therefore needed.

Communal systems may also serve small housing developments where rented property may be a part of the mix.

Neighbourhood-wide

In rare situations this might extend across a whole neighbourhood, such as the neighbourhood-wide analogue cable systems in some areas of Milton Keynes.

It is important that those who are responsible for these systems communicate with private landlords in the neighbourhood, as well as owner-occupiers, in a clear and understandable manner so that options and costs can be fully understood.

The final area of concern is in respect of how Government support for the vulnerable will assist those in the private rented sector.

Discussions at present are focusing on providing free set top boxes or other solutions such as FreeSat, with technical assistance, for those classed as vulnerable.

Williams concludes: "We believe that greater attention needs to be given to how support will assist those in the private rented sector where ownership and occupation are separate.

"Simply giving a FreeView box to a tenant who does not have access to a DTT compatible aerial in itself does not give that tenant the ability to continue watching terrestrial television after switchover.

"Packages of support therefore need to be tailored to dealing with the wider context of how best to ensure that occupiers can receive DTT.

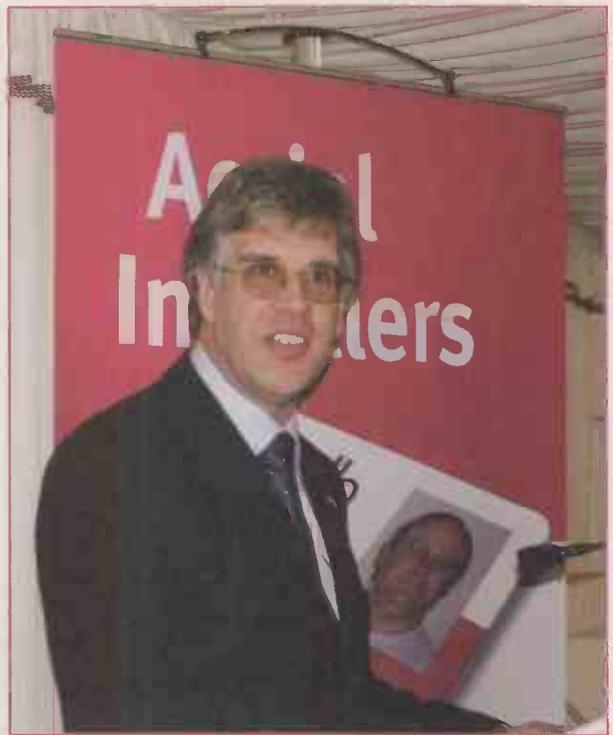
"As an organisation we are also looking to how best we can support our members during switchover and are keen to build links with those that might be able to provide solutions to landlords in respect of assisting switchover."

At present the notion running through much switchover planning and discussion is that the owner and occupier of the property are one and the same. This is likely to cause problems for the private rented sector unless assumptions are changed.

John Whittingdale MP, Chair of the Culture, Media and Support Committee commented: "This is a huge issue, which is going to impact on

every household in the land. If it goes wrong it will be a political disaster."

With some 2.5 million households living in private rented accommodation it may mean many TV screens going blank.



Bill Twigg, chair of the RDI-LB.

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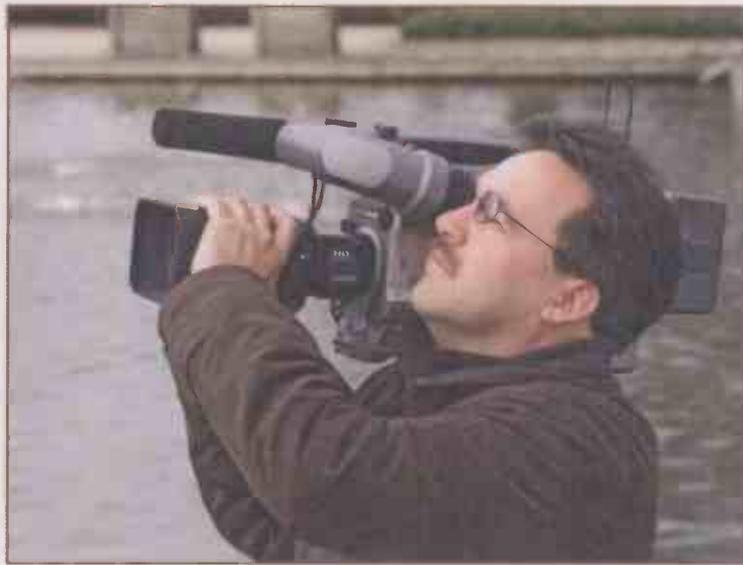
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Developing a tapeless workflow

Moving from tape to tapeless acquisition and production is likely to be a major investment, equivalent to choosing a tape format in the past. It may be a single big capital expenditure or it may be an evolutionary process over a number of years. Either way, the money will need to be spent, so it is vital that all the issues are investigated to be sure that there is a solid business case for changing, argues Jeff Rosica of Grass Valley.



Without really thinking about it, we have grown accustomed to systems that multitask.

The pressure to move to a tapeless workflow, particularly in areas like newsgathering, seems to be irresistible at the moment.

Why should this be? Can we identify real benefits – operational, technical and economic – or is this just a ploy by manufacturers to sell more equipment?

Perhaps surprisingly, I would suggest that, today, technical issues are perhaps the least of those concerns.

To be perfectly honest, most professional digital video formats capture reasonably good pictures and sound.

You know that you can only get away with a consumer level DV recording in the most exceptional

circumstances, but professional level DV formats and MPEG-2 all produce acceptable quality recordings.

I appreciate that there is an issue with editing recordings originated using interframe compression, and I will return to this point later.

For now, though, the one technical question that may arise is the need to migrate to HD.

HD content

Indeed, this might well be the driver for looking at tapeless workflows: the need to be able to capture and deliver HD content without increasing costs significantly or slowing down operations.

With Europe now very much in transition to HD, the ability to

handle both standard and high definitions (at both 720p and 1080i) should be on everyone's list of must-haves for new capital expenditure.

If we turn to the economic question, then we have to split it into three: capital costs, continuing costs (mainly consumables but also routine maintenance) and operational costs – how much staff time it takes to shoot, transfer, edit and deliver.

While the new brand of HDV cameras are now available at throwaway prices, there is still a feeling that a professional ENG camcorder costs around €30k, and that would be a good price point for a tapeless equivalent. If it did HD as well at that price, then the case looks very strong indeed.

The long history of tape-based systems has ingrained a feeling for the "right" price on media, too.

Everyone is used to paying somewhere between €25 and €50 for a professional quality tape. At that price the economics dictate that media needs to be reused, but there is no great urgency that has an impact on workflow.

It means that a journalist can shoot a story and, even if the selects are transferred into an editor or edit network, the tape can be held until the story is finally dead.

And if the odd tape goes missing – hidden under the journalist's desk, just in case – then it is not the end of the world.

When you move to a tapeless workflow then you need to consider this issue carefully.



The Iomega Rev drive is a removable hard drive with a 35GB capacity.

One manufacturer's solution, for example, uses proprietary solid state memory, which is an order of magnitude more expensive.

That makes recycling media imperative: the memory cards have to be wiped and returned to stock immediately.

Do you ingest all the rushes, which means bigger servers, or do you make a decision under pressure which risks losing a shot which will be needed later?

Which leads us to operational costs. Clearly the biggest boost to cost effectiveness is the elimination of the ingest stage.

You do not have to kick your heels waiting for taped footage to be sucked, in real time, into an editor or server. If you have a hot story you want to get onto the next news bulletin, nothing is more frustrating.

In that context, there is little to choose between systems based on magnetic disk, optical disk or solid state memory.

But I think we need to look a little deeper here. Without really thinking about it, we have grown accustomed to systems that multitask.

RSS feeds

While I am typing these words, my computer is also bringing me my emails, the web browser is continually checking for new RSS feeds, my calendar is maintaining synchronisation with the corporate network and the Skype agent is taking calls. All of these are boosts to productivity.

In the context of tapeless video acquisition and production, that same productivity would yield simultaneous capture and playout from the same device, multiple deliveries in real time and non-real time or multi-tasking, perhaps by handling metadata recording and processing as well as video and audio.

And, as I said, my everyday desktop computer can comfortably handle multiple tasks simultaneously, including accessing high definition video from magnetic and optical disks and solid state memory.

Why should it be so much more complicated in a professional video application?

This was behind the decision by my company, Grass Valley, to develop a completely new approach to camcorders and tapeless production, which became our Infinity series.

We looked around at what existed in

the IT industry and we realised that a lot of the components were out there.

More importantly, these were proven components, in mass production at commodity prices.

By taking these and adding our experience in making cameras and other top end broadcast products, we believed we could deliver a tapeless production device that met all the requirements.

I know that modesty should forbid me saying this, but it was actually me that spotted the potential in the Iomega Rev drive.

This is a product developed for the desktop market, a removable hard drive with a 35GB capacity and some pretty fast access speeds - fast enough to be able to offer true random access HD recording and playback with capacity to spare.

It was already available, with removable hard disk media at a price point which pretty much matched the cost of a DigiBeta tape.

A 35GB Rev media will record around half an hour of HD or up to four hours (dependent upon compression format) of standard definition.

So you get true non-linear random access and plug and play compatibility, but at a price which means you do not have to change the way your journalists, editors and operators work.

Similarly, while you can build systems around proprietary solid state memory, the Compact Flash format is well established, with multiple gigabyte cards available for much less than the proprietary SD memory cards.

A gigabyte is a minute of HD or a few minutes of SD, but if you know you are going to get a great shot but you do not know when, it is the perfect low-battery drain solution or transfer media to dub off a short clip well in the field.

Third, gigabit ethernet is widely available and has more than enough bandwidth, so why not use it?

The Infinity camcorder can be shooting high quality HD images to disk or solid state memory and simultaneously delivering content to a network over ethernet.

Other industries take this sort of IT flexibility

for granted: we should use it, too.

I started by saying that this is a time of evolution not revolution. Adding HD capability is challenging enough without forcing moves from other established standards.

Codecs

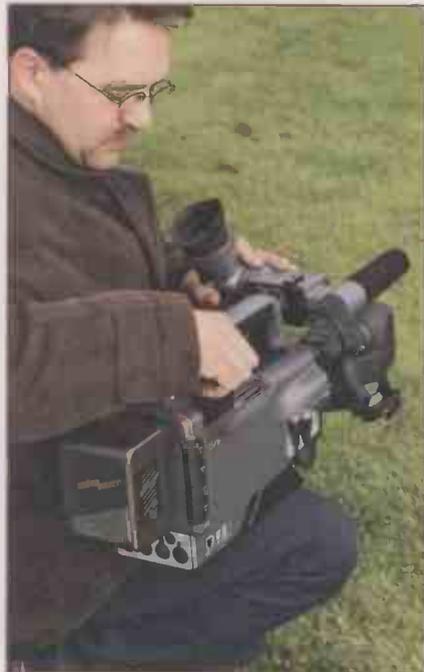
So Infinity includes codecs for current popular video formats such as DVCPRO and DVCAM at 25mb/s or MPEG2 with an optional plug-in module, allowing its convenience to drop into established systems.

For those who are starting from a blank sheet of paper, though, it also includes a codec for JPEG2000, the significance of which is that it is a highly efficient intraframe compression scheme: it delivers excellent images that can be edited without compromise.

Another advantage of JPEG 2000 is the lack of MPEG blocking artefacts when using high compression, and that a single high-resolution master can be used to create multiple lower resolutions files during the decode process.

The workflow benefits of tapeless production are undeniable, even if you only consider the time saved by eliminating ingest.

By blending technology from the IT world with our broadcast skills, Grass Valley has made it possible to create a system which also meets the technical demands - including delivering excellent HD and SD in the same system, even on the same shoot - and delivers economic benefits in capital cost, consumables, lifecycle maintenance and minimum disruption to proven ways of working.



A 35GB Rev media will record around half an hour of HD.

FAULT REPORTS

TV and DVD Faults

Panasonic TX-24DK1 (Euro-4 chassis)

Schneider STV2803T

Hitachi C28WF560TN

Naiko N1003

Philips 25ST2761 (GR2.2)

Hitachi 42PD3200

Akura ATPTV028FT (chassis unknown but
not PT92)

Sony KV20WS1U (BE5 chassis)

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Hitachi C24W511TN (A7 Chassis)

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Toshiba 42W33P rear projection TV

Toshiba 28YT56 (ak49)

JVC AV32H5SK

Samsung WS-32Z306V

Grundig WF56-3020 (PROFFESIONAL
2550 chassis).

Matsui 28WM05

Samsung SP50L7HXX/XEU

Matsui 32WN20(AK37 chassis)

Amstrad DRX400

Amstrad DRX180

Amstrad DRX300

Amstrad DRX400.

Test Case 521 ■

Les Mainstone ■ Michael Dranfield ■

Philip Salkeld ■ Glyn Dickinson ■ Neil Baker ■

John Parker ■

Solution – Test Case 521 ■

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Ref:404



Glyn Dickinson

Mitsubishi CT29A4 (Euro-12 chassis)

This ageing set was dead. After ensuring there was no line output short (which usually implies a dead LOPT and an uneconomic repair) I replaced the chopper transistor, the four small primary electrolytics and the surge limiter resistor. The set was happy again, but as I was replacing the back I noticed a previous repairer had carelessly disconnected the left speaker. Reconnecting it brought back good sound, but when I selected standby this speaker (only) emitted a loud buzzing. Not so careless, then! Capacitor trouble I decided, and eventually found C960 (1000uF, 35V) and C975 (47uF, 50V) were leaking badly.

Panasonic TX-24DX1 (Euro-4 chassis)

Three of these trotted in with the same fault – a gradual increase in brightness until the set tripped off. Do not bother taking the back off – it is our old friend the Philips W56ECK CRT. Sadly, sticking the name

'Panasonic' over the Philips label did nothing to increase the tubes' lives.

Schnelder STV2803T

This set had a very tall, distorted picture and a hissing LOPT. The transformer is very reasonably priced, so all that was necessary after replacement was to reset the geometry. To enter service mode, press the red and blue buttons on the RCU for two seconds – nothing will happen – then within five seconds press V+ and P- simultaneously on the front of the set. If you're lucky the service menu will appear – navigate with the cursor keys and press 'OK' to store.

Hitachi C28WF560TN

This applies to all AK45 chassis. The fault was not uncommon – the STV9379FA field output IC was short with damage to R614 (2R2 in this set but may be 0R47). Replacement brought everything back to life and the set was returned, only to soon fail again

in the same way adding R603 (0R47) to the casualty list. The customer mentioned it was fine until he switched his Sky decoder on. The penny then dropped – after replacing the damaged parts I cycled through the screen ratios and when 4:3 was chosen the picture collapsed and the field output stage started to overheat dramatically. Of course it was our friend the EEPROM, but this is the first time I've had one kill the field stage.

Naiko N1003

This is an LCD TV/DVD. No picture was the complaint. I took the back off to look for the picture valve, but no luck. I found that turning the set on and off caused the backlight to flash, and on inspecting the converter PCB, two of the power ICs had overheated. To my surprise, Naiko despatched a replacement PCB in a day at a very reasonable price. Sadly, however this didn't cure the fault as there was a leak on one of the backlight sections. So it was the picture valve after all, then!

Test Case 521

In Test Case 512 (August last year) our man-on-the-road Todd had an 'LCD day'. Now he's about to embark on a Toshiba morning, just by the coincidence of how the jobs flow in and out. Pam gave him three repair cards, all relating to Toshiba TV sets of various types and sizes – and off he went, brrrm.

The first of them was a rented one, model 32YT56. Todd was conducted to the living room and shown the TV and, sitting below it, a VHS deck containing a childrens' cartoon cassette. He was told that the TV worked perfectly OK in displaying pictures from its own tuner, and from tape recordings which had been made in the VCR. The problem arose when playing cassettes recorded elsewhere: with these the top of the picture wobbled and pulled to the left. Our man tried the nearby DVD player, and found that its picture was fine. He brought in another VCR, to find that while the symptom – on replaying the customer's tape and one of his own – was a little different, it was still present. Although Todd didn't know it, this sort of thing was rife many moons ago when VCRs first appeared on the market, before he was born! Here the problem was resolved on the spot after a phone conversation with Sage at the workshop. Can you guess how?

Flushed with success, Todd headed north to Crowfield where another Toshiba rental TV set – this time a smaller one, model 21N21B2 – awaited him. Accused of intermittent sound, it behaved perfectly well as Todd pulled back and flexed its printed-circuit panel and then tapped it all over with the handle of his

screwdriver. How often, he asked, did the sound disappear? "Sometimes". Did it happen on all channels? "Not sure, it did it on Eastenders last night". Todd squirted a freezer aerosol over relevant components and areas of the PC board without any effect at all. Into the van it went, then, and a loan set took its place. In fact this one could have been diagnosed (but not repaired immediately) in the field if Todd-boy had been more patient, persistent and probing. But hindsight is a wonderful thing, isn't it?

The morning was half over as the big van headed back south to base to pick up Cathode Ray. There would need to be at least two pairs of hands if it were necessary to bring in the whopping rear-projection set, type 40WH08B, which made up the last of this Toshiba trio. It looked incongruous in the little flat over the chemists shop, dominating the living room! The lads were hoping for something simple like a mains or aerial plug having fallen out. Needless to say nothing of that sort had happened; in fact the set would come on for about one second then shut itself down with its green timer light flashing.

Ray and Todd couldn't even be sure whether or not the EHT supply was coming up in the brief operational window, but plainly some protection artifice was taking effect here. This was one that Sage couldn't solve over the phone, so the monster had to come into the workshop. Your clue here is that the failure was associated with a circuit exclusive to CRT projection TVs in an 'auxiliary' but vital function. See page 412 – but think first!



Philips 25ST2761 (GR2.2)

A bright blue raster with flyback lines on a Philips is rarely welcome. This is a conventional 4:3 25" set, however. A look at the CRT base panel revealed a nasty mess due to C2411 (330uF, 25V) having leaked. A replacement capacitor, R3415 (10k), which had corroded away and a good clean up brought back a good picture. If only Philips widescreen tubes could be this reliable!

Hitachi 42PD3200

These plasma sets are well out of guarantee now and there are a lot of them around. The main fault with them is the complaint that they are difficult to get out of standby – the red light goes off then nothing. Eventually the set will fail completely. The fault is in the AVC tuner box and is due to the STR-F6668B switch-mode IC, part number CZ00869. Replacement is fairly straightforward. After removing the top and bottom casing and the screws and nuts on the rear panel the digital PCB can be lifted clear, but take care not to damage the ribbon cable. The IC is then accessible for replacement. Do not forget if you swap the AVC box it must be for an identical set – otherwise the picture size will be incorrect and there are no height and width controls! Another fault is a noisy transformer in the main unit. It is T501 and replacements have been modified, although they still make a noise, which can annoy fussy customers.

Les Mainstone

Akura ATPTV028FT (chassis unknown but not PT92)

At switch on, this set displayed a good sound and picture for about a minute or two before the line time base shut down leaving normal sound and the front LED lit. HT voltage in the line stage remained normal with the fault on, so by patiently switching the set off to cool it I scoped the waveform back from the line output transistor, past the line oscillator driver transformer and through the line driver transistor Q580 (2SC1573A). With the fault on, the waveform disappeared at Q580

collector but at the base connection the waveform changed from the expected square wave, to a saw tooth waveform at the moment the fault occurred. I scratched my head at this but decided to replace Q580. This cured the fault!

Sony KV20WS1U (BE5 chassis)

The customer complained of lines across the screen, so I immediately checked for dry joints around the main PCB. Quite a few were located and repaired so switching on, I confidently expected a normal picture. I found good sound but badly bowed sides on the picture. A check around the east/west correction circuitry revealed an open circuit resistor R841 (4R7). A replacement cured the set's problems.

Bush WS6675 (11AK37 chassis)

The front LED on this unit remained alight, but otherwise the set refused to switch on. Replacing IC800 (MC44608 opto coupler), Q801 (SFH617A), and R853 (150k), all of the above in the primary of the power supply, brought the set to life.

Panasonic TX32PD30 (GP1 chassis)

The customer's comment on the report sheet indicated a loud bang before the set died. I firstly checked around the power supply for shorts but found none. The main smoothing block had remained charged so after discharging, I carried out a resistance check around the main power regulator IC801 (STRF6656). Pin 2 and 3 appeared to have shorted, so I removed the device. Sure enough a large hole was found in the casing. Diode D809 (Panasonic code MAZ20820A0LS), had also failed. Replacements cured the problem.

Bush WS6674 (PT92 chassis)

The customer complained, quite graphically, about the picture sides bowing in, so automatically I removed the obvious capacitors, CD20, CD21, CD22, and resistor RV38. However they checked out OK. I scratched my head for a bit so decided to switch the set on. Up came a perfectly formed picture with no obvious distortion, (switching to text is the best test for this). Assuming the customer would not

make up his description of the problem, I resorted to soldering every joint in the surrounding circuitry. Touching the iron to one leg of LD03, feeding from pin 3 of the LOPTX I was rewarded by a perfectly hidden dry joint.

Sony KV25F3U (BE3D chassis)

At switch-on this heavyweight set would start up, followed by a loud crackling rush of EHT before switching itself off with no front LED. I checked around for any obvious signs of a problem but found none. I decided to replace the main power supply regulator IC600 (STRS6709), and the opto coupler (TLP721), assuming that the supply had risen beyond the auto shut down limits. Fortunately I was proved right, after replacement, the set worked perfectly.

Philips 32PW9527 (EM5E chassis)

I have had to modify the hydraulic lift in my workshop now, to cope with the increased weight of the sets I am being asked to shift, and this set certainly tested my mod. The customer had complained of it being out of focus, but by the time it reached me, the picture had disappeared. At switch on the EHT rustled up and sound appeared to be normal. All heaters were lit so I checked the grid 2 voltage on the CRT. They were non-existent. A highly priced replacement line output transformer cured the problem although getting the old one out, and fitting the new TX tested my mechanical abilities to the limit, (is there someone in the world devising even more cunning ways of constructing plastic holding clamps that defy logic?)

Bush WS7674SIL (PT92 chassis)

This set refused to come out of standby with the red LED glowing steadily. The HT appeared to be normal at the collector of the line output transistor but the line stage appeared to be dead. I checked unsuccessfully for a waveform at the base of the line oscillator transistor (TD01), and at the output of the main micro controller and video processor (IV01), Pin 33. Next I checked the 3.3V feeds to IV01 at



pins 61 and 54 and found no problem. At this point I reached for the computer mouse to price up a new IC but paused just long enough to scope the oscillator waveform of the chip's crystal oscillator XV01 (12MHz), not expecting there to be a problem. I was surprised to discover no sign of life. A replacement cured all of the set's problems.

Hitachi C32WD2TN (A7 chassis)

This set displayed a bright red screen for about five seconds before shutting down to standby. I removed the back and saw that the CRT was a Philips. Groaning silently, I expected to have to pass the customer the good news. Instead I removed the CRT base and gave it a quick peep and was surprised to discover a number of distressed components. R801 (270R), R807 (560R), transistors Q816 (BF422) and Q806 (BF423), had all failed. Replacements returned to set to full health.

Naiko N2866

Having stripped this dead set, I found the main smoothing capacitor fully charged despite not having switched the set on. Fortunately I always check this item first, as I suspect most engineers do. I have the scars to prove my lack of care in this respect in the past! The charged capacitor indicated that the power supply had not started so I began to check resistors in the primary of the power supply. Resistor PR1 (10M), held its hand up. A replacement cured the problems on this set.

JVC AV24WT5EKS

This 24" widescreen would run for four seconds and then shut down to standby. The picture and sound in that time frame were good but I did notice a slight lack of width despite the set being in the auto screen mode. I was not sure where to begin my search. The processor was obviously sensing a problem somewhere and shutting the set down so I started in the line scanning stage, bearing in mind the lack of width. I was surprised to discover a beefy brown capacitor C521 (5.9nF 1.5kV), reading 1.2nF. I replaced it and found to my delight the set worked perfectly. The capacitor by the way showed no signs of distress!

Thomson 10MG73B (TX91 chassis)

The standby light on this portable mains battery set remained lit but otherwise the set remained dead. The power supply voltages were all checked OK so I turned my attention to the line stage. The line transistor collector was over 110V so I moved back to the line oscillator driver transistor. No voltage at all on this device, so I checked back to the 24V feed to this circuit. Eventually I came across RL10 (220R 0.43W). It is mounted right at the rear of the main PCB behind the line stage screening cans. One leg of this resistor was dry jointed.

JVC AV28T4SK (JW chassis)

A quick check around the power supply on this dead JVC quickly revealed a short circuit Q901 (STP13NK60ZFP). This expensive transistor and IC901 (ICE1QS01) were obtained and fitted. Before switching on I carried out a thorough cold check around the rest of the power supply. Only one other component was found to be faulty, R909 (1.8M 0.5W), was open circuit. With fingers crossed I switched on and was rewarded with good sound and picture.

Philips 24PW6006 (L01.1E chassis)

This fairly new set arrived completely dead. Having removed the main PCB, the fault soon became apparent. Several pieces of print had blown around the power supply. I did a quick estimate of parts and rang the customer expecting the usual reply about binning it. To my surprise he gave me the go ahead. The following were replaced. TR 7522(BC847A), TR 7521 (STP7NB60FP), R 3523 (470R), I/C 7520 (TEA1507), D6523 (1N4148), D6526 (BZX284-C22). I then cleaned the print and bridged the missing bits. I held my breath, switched on and was rewarded with a good sound and picture.

Watson (11AK37 chassis)

I knocked expectantly on the customer's door. It was opened by a modern day hippy dressed in colourful clothes. She smiled, glanced over my shoulder at the van and nodded towards the garage. "It's in there," she said. "Been there for a couple of weeks." My heart fell, thinking of

another wasted journey. I removed the set from the garage floor and carried it inside. It did not take me long to find a short circuit line output transistor (BU2508AF), and C621 (9.1nF 2kV), had a badly burned leg. Replacing the two components brought the set to life. My silent prayer must have landed somewhere!

Bush WS7673 (11AK37 chassis)

The front LED remained steady and a gentle ticking emanating from somewhere around the line or power supply was the only clue to this set. A quick check on the power supply confirmed it was functioning. I put my ear closer to the set and found the ticking was indeed coming from the line stage. The line output transistor measured OK so I connected up the trusty transformer tester. The scope showed a mass of ragged lines. Replacing the line output transformer cured all the problems.

Michael Dranfield

Grundig M95-410-9-REF/PIP

This monster CRT set came in with intermittent no sound although sound was present through the headphone socket when the main speakers went off. I found that all five audio amplifiers were cut off and after borrowing a service manual it didn't take long to find out why, a common mute line is fed to the five audio amps and consists of a couple of surface mounted transistors CT4001 (BC857B) and CT40066 (BC817-40) as they both tested OK in circuit I decided to replace both. This cured the fault.

Sharp 32HW-53H

If after repairing one of these sets that has had a dry joint on the scan coupling capacitor and the picture appears corrugated go straight for zener diode D516 47V. You will find it measures fine on a forward resistance check but in all sets I have done the zener break down voltage has fallen to around 13V.

Sharp 37GQ-201R.

The line transistor Q601 (BU508D) in this set would fail intermittently. The cause was traced to a dry joint on the -10V rectifier diode. This rail



is used by the line stage to ensure a sharper cut off of the line transistor. It is however also a good idea to replace capacitors C603, C604 both 220uF 10V in the -10V smoothing line as these can dry out and cause the same problem.

Philip Salkeld

Panasonic TX-32 DK1

A big set came in with no red, but when we tried it, it was dead. The latter was a short circuit line output transistor Q551 2SD 1577. Once replaced the set started up but with the original fault of no red. Tapping the tube neck restored the red but you do not generally associate Panasonic tubes giving trouble. However on closer examination, what Panasonic have done is place their label across the Phillips/LG logo. The tube W76ESF031X13 was quite expensive at £270+Vat. But it completed the job.

Bush RF6683VPL (11AK45B5 Chassis)

This set worked perfectly. However in standby there was a harsh ticking noise coming from the set through the loud speakers. My thanks to Bush technical, who suggested replacing C133 and C134 both 220mF 25V. These two capacitors form the LT decoupling components for the sound output stage. Nice to get good help.

Sharp 76FW 53H (DA50W Chassis)

This set came in with the top of the picture cramped. Using the hairdryer and freezer quickly brought me to C509 (220mF 25V). Replacement restored the correct scan. One thing I have noticed on these large screen sets is a low emission tube. When you first switch it on the brightness level jumps up in stages until the CRT is at its correct working temperature.

Hitachi C24W511TN (A7 Chassis)

Dry joints on these models have been a constant problem, generally causing switching to standby. Dry joints are now appearing on the tube base showing coloured images around objects. Q801/2/3 the RGB output transistors just need to be cleaned and re-soldered.

Daewoo DTE28G76B

This set came in dead, the standby light would appear and when brought out of standby it would turn to green, but that was all. A clear indication, no line drive. When this happens you generally find I301 TDA8358J frame IC short circuit on two of its pins, which drags down the LT rail. This was the case again, but, when replaced and the two pins checked on the print side, the short circuit reading appeared again. Tracing back I came across zener diode D367. Unfortunately I do not know its value as I took it off a scrap board. This finally returned the set to working order.

Neil Baker

BEKO 28411 NDS / Beco 28416 NDS

These models are renowned for being dead with no sound or picture. The simple cure is to replace the HNC fuse with a time lag fuse of the same value 2.5A A/S.

Bush WS6678SIL

The customer reported intermittently reverting to standby. Sure enough after a long soak test the fault emerged and closer inspection on the regulator ICS 1823 showed it was cracked around its legs. I also soldered 1820 and 1822 to cover a return call.

Hitachi C28WF560N (11AK45 chassis)

Excessive Width and E/W faulty. We have now had several of these set with the same fault. Replace the EEPROM and reset all parameters (over 150 to check).

Matsui 1408R

Dead: no sound or picture. The standby LED could be switched on and off via the remote or TV controls. Tests showed 130V at the collector of Q504 which is used to switch the B+ rail. We found the cause to be R520 which is an 82k resistor - it had gone high in value.

John Parker

JVC AV28E88SK (AK49)

The line transistor Q600 (BU2508AF) was short circuit with R612 burning up. Check C609 (47nF 250V). It goes open circuit. I have had this fault several times now.

Grundig WF70-3020

This set had excessive width with no east-west correction. I found a direct short circuit across D807. I traced the short circuit to IC401 (STV9306) being short between pin 11 and 8. Also capacitor C409 (10uF) was open circuit.

Toshiba 42W33P rear projection TV

This set would come on with no raster. Turning up the G2 showed there was no frame scan. Also diode D405 (RH4F) would intermittently go short circuit. After replacing the diode and checking the frame IC for signal and voltage, I came to the conclusion there was no frame drive to the frame IC (Q301 LA7833). Following the signal back I found it to be present at the video IC Q510 (TA1276AN0) pin 32. It was also present at pin 12 of the ED-WAC PCB module, but not present at its output pin 16. I checked supplies along with clock and data. All were correct. Replacing the ED-WAC PCB provided a complete cure with normal picture and no further failing of D405.

Toshiba 28YT56 (ak49)

This set would try to start up then would immediately shut down. The power supply appeared to be squealing. After various checks for shorts in the secondary I found IC802 (AN SCR, MCR22-5) was short circuit. This is part of the standby circuit.

JVC AV32H5SK

At switch on there was a red picture. After a few seconds, the picture would then saturate red. Sound was OK. I initially thought the tube was faulty but checking the red drive seemed to point to a pre-drive fault. I swapped the red and green feeds over and got a saturated green picture indicating I had a pre drive fault. I then decided to check teletext. This turned out to be perfect. Something I should have done earlier, studying the circuit diagram, I traced the missing red signal to the micom/100Hz panel. Looking at the block diagram showed two possible causes: either IC201 (VSP9402A) or the DDP3315C deflection IC. I initially replaced IC201. This did not cure it but replacing deflection processor DDP3315C did.



Samsung WS-32Z306V

This is the new slim TV with greater reduced electron gun length. This set would switch on and immediately shut down. I found the HT was present but no line drive. I had line drive at the gate of line driver FET Q402, but none at its drain. The HT on the drain was 1V. Measuring Q402 I found it to be drain-to-source short circuit. Replacing Q402 fault. If you have to replace a tube in this set as I have had to, be aware: they are very heavy (44kg) and the tube is stuck in with self adhesive tape, so when you remove the screws that hold the tube in place, you almost need a crow bar to remove the CRT.

Grundig WF56-3020 (PROFESSIONAL 2550 chassis).

This set would come out of standby then after a few seconds shut down with the standby LED flashing. The HT was present along with line

drive. However the frame output on ICF1 TDA8358J was distorted. Its drive and supply was OK. Replacing the TDA8358J and a general solder up cured the fault.

Matsui 28WN05

This set had swirling patterns on the picture. Using my ESR meter I found C517 (470uF) to be open circuit. A check check on the adjacent caps showed all was well. Replacing C517 cured fault.

Samsung SP50LHXX/XEU

This huge digital light projector looks like the letter T. This set had too many pixel dropouts. I had to replace the digital micro mirror device (DMD). The optical block is mounted in the column of the projector and is removed from the rear of the project. Several leads need to be unplugged plus two silver screws - the whole block can then be removed. You then

need to remove the lamp followed by the ballast board, which is held in place by a plastic housing. Two screws remove this to show a silver can assembly. Removing the can and several screws exposes the DMD. A clip and heat sink need to be removed, then the DMD can be replaced. Reassembling is the reverse procedure. In my case there was only minor X lateral adjustment needed. Looking from the rear on the right hand side of the optical block, two large adjustment screws are present - An X adjustment and a Y adjustment. A colleague stood in front of the projector while I adjusted the X adjusting screw. The image adjusted easily. A soak test showed all was well.

Matsui 32WN20(AK37 chassis)

This set was stuck in standby with no secondary voltage. Diode D803 was short circuit.

Satellite Fault Finding



Michael Dranfield

Amstrad DRX400

This box said no satellite signal been received. I found there was no voltage on the LNB socket. It is always a good idea just to check in the installation menu to make sure the customer has not turned off the LNB voltage, but this was set to on. The problem was traced to the supply voltage on the CX24108-20 ZIF chip pin 1 should be 5V but was only 4.5V. Tracing this back to an 8-pin SMD regulator U101. The 6.7V input was also low. Now this comes straight from the power supply and here lay the problem: C8 470uF was low in value.

Amstrad DRX180

I spent some time looking for this fault. After boot the box said no sat signal had been received on both inputs but if you called up the channel listings some would be found

and in the system set up box 07D4 was displayed but no signal strength or quality. The problem was eventually traced to an open circuit SMD resistor R116 (300R) just behind the screening can for ZIF tuner number 2. I had trouble finding a 300R resistor but the box seemed quite happy with a 330R fitted.

Amstrad DRX300

This box said no satellite signal received and there was no voltage on the LNB socket. There was no reference clock running at pin 17 of the CX24108-20 ZIF chip but neither this chip nor the 10.111MHz crystal was faulty as is usual in this model of box. The cause was a low output from IC104 (L4931) regulator chip. The 5V output was only 2.5V and is used only by the ZIF chip.

Amstrad DRX400.

This box came in from another dealer who had already replaced

some caps in the power supply. It was breaking up on sky news and it turned out to be caused by a capacitor he had missed. However while testing the box out, I found the RF output was stuck on one channel. Back to the power supply the modulator 30V rail was found to be missing. This was traced to a couple of open circuit diodes D1 and D4, both 1N4148. I replaced these and switched on but the box was now tripping. The 30V rail was found to have a 12-ohm bi-directional reading. I thought the modulator may have been damaged but the fault was traced to a short circuit SMD zener diode D701 (MMBZ5256B) that stabilises the 30V rail. It is right behind the modulator. In this model a dried out capacitor in the PSU causes all the output rails to rise and this will have been without a doubt where all the problems stemmed from.

Solution to Test Case 521

Well – Toshiba territory this month! We like Toshiba sets, even those which fail as mysteriously as these. The first one, type 32YT56, hadn't actually failed at all – it just wanted setting up properly. Page 11 of its users manual indicates that the EXT2 Scart socket should be used for hook-up to a VCR or disc player, and in the former case it's necessary to go into the installation menu (picture), select VCR MODE and set it to ON. With this done, the verticals in all tape-playback pictures were stable. If the link to the TV is via an RF cable, programme 0 should be used.

That was the only one of the three sets which

stayed clear of the workshop! The 'little' one, 21N21B2, came in and finally showed its fault on the soak-test bench. The guilty party was the loudspeaker itself, a tiny one whose cone-mounted joint between speech coil and coupling pigtail was dodgy. The replacement cost just £2.20 plus VAT from Toshiba....

The most difficult diagnosis of the three related to the projection set. The quick shutdown was due to the overcurrent protection system cutting in, and after much checking it was found that merely disconnecting plug P603B on the convergence module brought up a picture – of sorts! Convergence-drive IC Q752 had an internal short-circuit.

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UK leads the world in Digital TV take-up

Ofcom has published its Communications Market: Digital TV Progress Report for the fourth quarter of 2005. The report examines data provided by the main digital television platform providers for the October-December 2005 period. It shows that the UK has the highest digital penetration of any country in the world.

As of 31 December 2005 digital television was viewed by just under 70% of all UK television households, up from 65.9% in the previous quarter. Take-up has not passed the 50% mark in any other European country.

Preliminary sales figures of Freeview (Digital Terrestrial Television or DTT) set top boxes suggest that by the end of February 2006, digital penetration had exceeded 70% of UK homes.

Take-up varies across the UK - in Wales, for example, digital penetration had reached 80% by the end of 2005.

For the first time, there are now more digital satellite subscribers in the UK than there are homes watching analogue terrestrial-only TV, as a result of continued growth in BSkyB's subscriber base and large numbers of households switching from analogue terrestrial television to digital terrestrial services.

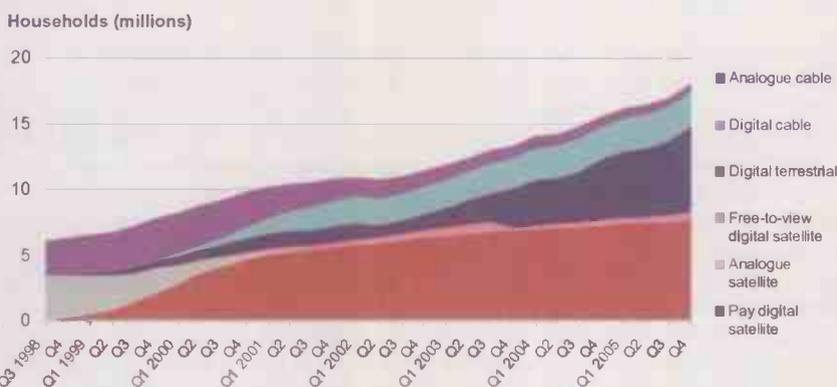
Over the whole of 2005, more than 2.7 million additional households began viewing digital television for the first time - more than in any previous year.

By 31 December 2005, the total number of households viewing digital television services on at least one TV set in the home stood at 17.5 million.

The report also reveals that almost one in four UK adults live in homes where all TV sets are now used for digital television viewing and viewing of analogue television services has ceased entirely.

Digital satellite television

At the end of 2005, more households were watching BSkyB subscription



Source: Ofcom

Digital and multichannel penetration of UK households

services on their principal TV set than were watching any other form of television service (Source: Ofcom market intelligence).

BSkyB added 194,000 subscribers in the fourth quarter, bringing its total number of UK subscribers to 7,666,000 (Source: BSkyB).

BSkyB pay-TV services are now present in just under a third (30.5%) of all homes with free-to-view digital satellite services viewed in a further 2.4% of homes (Source: Ofcom market intelligence).

DTT (Freeview)

More than 10.5 million Freeview boxes had been sold by the end of 2005, with the average price paid for a Freeview box - £41 - having halved in just over two years. (Source: GfK).

In the last quarter of 2005, more than 1.9 million Freeview set-top boxes and integrated digital televisions were sold - almost 500,000 more than the corresponding

period in 2004. (Source: GfK)

Freeview accounted for seven out of every ten households watching digital television services for the first time in 2005 (Source: Ofcom market intelligence).

Digital cable television

The total number of subscribers to cable television increased slightly during the quarter to just over 3.3 million.

Digital cable subscribers increased by over 71,000 while analogue subscriptions fell by 58,000.

Digital cable now accounts for 2.72 million of the total cable subscriber base. (Source: ntl, Telewest results Q4).

Cable serves 13.2% of television homes and ADSL Internet Protocol-based digital television services (Homechoice and Kingston Interactive Television) serve 0.2%. (Source: ntl, Telewest results Q4, 2005).

Choose the middle way

IPTV middleware maker Orca Interactive has released its RiGHTv 4.5 Service Delivery Platform (SDP) for the third party application developers with IPTV value chain components such as video servers, CA/DRM and encoders, and household set-top boxes (STBs).

“It is hard to predict what will be the next killer application,” said Yosi Glick, vice president of marketing and business development at Orca Interactive.

“So rather than trying to identify such hard-to-anticipate applications, we allow operators to deliver a broad mix of services that address varying trends and consumer needs.”

Orca’s IPTV SDP provides the vertical video element within the full quadruple-play converged SDP that manages video, data, audio, and wireless application delivery.

It enables triple-play providers to deliver broadcast TV, video on demand (VOD), personal video recording (PVR), home media and other interactive services.

Yosi Glick was a speaker at the TVoDSL Conference and Triple Play Showcase in January at the Sofitel Forum Rive Gauche, Paris.

He discussed how IPTV operators can address the changing market needs for middleware such as scalability, availability, service control, new service delivery and interoperability.

The middleware session was chaired by Isabelle Amonou, an industry analyst from France Telecom R&D, and included executives from MediaTVcom, Kasenna and Kreate! Communications AB.

Prior to joining Orca in September 2000, he headed the IPTV activities of Oracle Israel, working with local Telcos and cable operators. Glick began his career with Accenture and holds a bachelor’s degree in Information System Engineering

from the Technion Institute of Technology, Haifa, Israel.

The 2006 TVoDSL Conference and Triple Play Showcase featured major manufacturing, economic and regulatory players addressing technical issues about video transport standards, set-top-boxes, home networks, middleware, access networks and compression tools.

Attendees learnt about a set of trials and real services through the experiences of France Telecom, Telefonica, Video Networks and other new major players in the field.

Triple Play Showcase

The Triple Play Showcase featured 60 international players exhibiting their offerings: TV over ADSL, VoIP and Video over IP.

Glick also participated in an expert panel at the IMS Research IP-Trends Summit: IP Video for Multi-Channel TV, VOD & Mobile TV last November in San Francisco.

He joined a panel session on “Software Essentials – From the OS through Middleware to the User Interface.”

The session was moderated by Steven Hawley, an industry analyst and consultant from Advanced Media Strategies, and included executives from ANT Software and OpenTV.

Last November Dr Ofer Weintraub joined the company as chief technology officer. A telecom and wireless technology industry veteran, Weintraub brings more than 11 years of experience to Orca Interactive.

As CTO, he is responsible for the technological roadmap of Orca’s RiGHTv middleware.



Glick: “Hard to predict what will be the next killer application.”

Most recently, Weintraub was a telecom and cellular consultant with The Standard Insider, a consulting firm based in Herzelyia, Israel and focused on mobile data services and IP infrastructure (IMS).

Weintraub holds a doctorate in chemical physics from the Weizmann Institute of Science in Rehovot, Israel, and earned his master’s and bachelor’s degrees from the chemical physics departments at Tel Aviv University.

At the TelcoTV conference in San Diego, Nortel launched competitive differentiation over existing television offerings.

Broadband network

Nortel’s IPTV solution uses a service provider’s broadband network to deliver television, video, and other advanced services to subscribers.

By integrating Nortel’s industry-leading SIP-based multimedia communication technology into the television experience, IPTV subscribers can use their TVs to communicate and interact with their friends and family through a variety of media, such as voice, instant messaging, video, and picture sharing.

In addition, Nortel’s solution works with wireless devices such as PDAs and cell phones.

“Nortel strives to provide more than a superior IPTV network for our customers,” said Walt Megura, general manager of broadband networks at Nortel.

"Our goal is to enable new and exciting IPTV applications that give our customers a competitive advantage to win and retain IPTV subscribers.

"By using a Nortel solution with our ecosystem partners, service providers can benefit from a complete solution that has been extensively tested to help ensure high levels of end-to-end reliability, security, and cross-solution management."

Strategic ecosystem

Nortel has established a strategic ecosystem of IPTV providers and products to form a complete end-to-end solution.

Extensive testing in Nortel's IPTV lab in Ottawa helps ensure that the solution will meet the demanding functionality, reliability and security requirements of service providers.

The end-to-end solution, including the underlying high-performance Ultra Broadband access network, will be sold and supported by Nortel, which has proven experience and the extensive professional services required to support the deployment of large service provider networks.

Another challenge that IPTV introduces for telco service providers is the complexity of integrating the many new components that are required to acquire, process, and deliver high-quality video services.

Nortel is helping customers eliminate this added complexity by providing a single point of contact to manage the entire network build-out, as well as a broad range of professional services geared to removing the risks associated with planning, operating, and managing an IPTV network.

"As telcos move to deploy IPTV services to compete with cable triple-play offerings, network complexity and time-to-market delays are a real obstacle to success," said Matt Davis, director, Broadband Access Technologies, Yankee Group.

"Service providers are looking at a variety of integration options, and companies like Nortel can support and speed up the rollout of next generation services by helping them fuse together voice, data and IPTV."

Nortel offers end-to-end IPTV solutions for both the North American (ANSI) and European (ETSI) markets from a variety of

best-in-class vendors, and will continue to augment its IPTV portfolio with products designed to provide customers with the best possible solutions.

Nortel's current end-to-end IPTV solution ecosystem includes: IPTV middleware from Minerva Networks and Orca Interactive; video-on-demand (VoD) from Kasenna and BitBand; content security solutions from Irredo; encoders from Harmonic and Optibase; a Web browser interface from Espial; digital program insertion (DPI) from Terayon; an emergency alert system (EAS) from Trilithic; xDSL modems from Westell; and set-top boxes from Amino.

Uniting three of the top-tier technologies in the streaming media industry, Texas Instruments last

signal processors (DSPs).

It is built around a programmable DSP with video and audio peripherals that match consumer entertainment equipment specs.

And it offers vast scalability options, helping streaming media manufacturers keep up with their ever-evolving industry, especially when it is used in conjunction with ANT and Orca software.

ANT, a leading provider of advanced embedded solutions for digital TV, presents customers with a highly dynamic browser-based solution that, when coupled with the advanced capabilities of the TI silicon, gives service providers interactive content applications with feature-rich digital TV programming.

ANT's software controls everything from VoD interfaces to dynamic news, information and communication applications.

"ANT has long seen the value of teaming with TI because their DSPs support advanced software coding that makes it easy for OEMs to get to market quickly with our products like Galio, PurePlay and Fresco," said Stephen Reeder, executive director, sales and marketing at ANT Software.

"By adding Orca middleware to the mix, the package is complete, giving

broadcasters and operators an even greater opportunity to add services over their existing bandwidth that increases revenue."

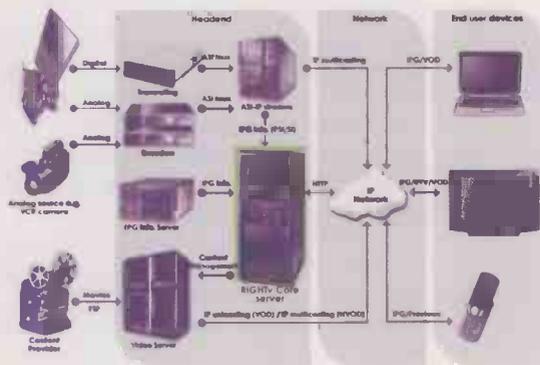
"By coupling our software with TI hardware and ANT's browser technology, we are giving providers a one-stop-shop that enables them to deliver the services that give subscribers choice, convenience and control," added Glick.

The combination of Orca middleware, ANT browser and TI silicon means that the owners of the key streaming technologies have come together, making it possible for encoder vendors, VoD servers and conditioned access providers to be added to a streaming media ecosystem that is fully interoperable.

This package is available today running on the TMS320DM642 digital media processor with a road map to DaVinci technology. ANT and Orca Interactive have indicated they will be among the first to take advantage of DaVinci technology.

www.orca.tv

ORCA Interactive Services Solution Map



September joined forces with software providers ANT and Orca Interactive to facilitate interoperability for manufacturers of IP Set-Top-Box products and services.

DaVinci technology

By bringing the core software together on TI silicon - soon including the new DaVinci technology, an integrated offering of processors, software, and tools - the three companies deliver an end-to-end solution for IPTV and Video on Demand (VoD) capabilities today. For more information on DaVinci technology, please see: www.thedavincieffect.com.

This robust development ecosystem was made available today on TI's high-performance digital media processors. And manufacturers soon will be able to upgrade designs on the code-compatible DaVinci technology.

The streaming media version of the DaVinci technology will be a system-on-a-chip based on high-performance TMS320C6000 digital

The scramble for HDTV

The Digital TV Report, prepared by Continental Research, says the last three years have seen significant increases in the growth of homes receiving multichannel TV, mainly driven by FreeView, the digital terrestrial TV service. 72% of all households (around 17.9 million) now have multichannel, up from 66% in July 2005, and 62% in February 2004, a year on year growth of 16%.

Multichannel penetration has increased steadily since the launch of the first UK satellite service in early 1989.

Figure 1 shows the percentage of homes with multichannel TV in the spring each year since 1993, whether delivered by dish, cable or digital terrestrial services.

As with multichannel TV, digital TV penetration has seen a continued rise. 69% of homes with digital TV equates to 17.3 million homes, up from 15.8 million in July 2005.

This is a substantial increase of 10% over six months, driven by FreeView's continued success.

The six point increase in penetration over the last 6 months compares to a four point increase from February 2005 to July 2005 indicating no slowing in growth, certainly helped by the Christmas period in Q4, when we would often expect to see increased sales of digital TV services.

Continued growth for FreeView plus, to a lesser extent, Sky and cable, is pushing digital TV penetration towards the Government's goal of 95%.

However, it remains to be seen whether growth will continue at the same rate in the next year or so, as the remaining non digital homes are likely to be the most resistant to change.

FreeView

Since its launch in 2002, FreeView has developed into a credible platform for broadcasting digital television, now second in size to Sky. Digital TV penetration has exhibited strong growth since mid 2003.

FreeView boxes have been selling well, with sales at Christmas 2003, 2004 and 2005 reported as particularly buoyant.

Continental Research estimates that 6.4 million homes now have FreeView, up from 4.3 million 12 months ago – a year on year growth of 49%.

5.8m FreeView homes are solus FreeView and 600,000 have FreeView in addition to satellite or cable.

Compared with July 2005 data, Sky Digital has gained 300,000 customers and reached the eight million target by the end of 2005, as

predicted by Sky and Continental Research in previous reports.

FreeSat, introduced in October 2004, seems to be gathering some pace, growing by 200,000 in the last six months.

FreeView gained 900,000 customers from July 2005 to February 2006. FreeView has appealed to new demographics and attitudinal segments and should continue to grow in the coming months.

Cable

Cable has made little gain in terms of TV subscribers, rising from 2.7 million in July 2005 to 2.8 million in February 2006.

However, it is likely that cable's telephony and broadband elements will continue to grow and the 'triple play' offer, if positioned and serviced correctly, will provide cable companies with a meaningful point of differentiation to Sky and FreeView and a business model upon which to grow.

Younger households and families with children remain the key segments for multichannel TV, both digital and analogue.

Adults with digital TV are more

likely to be young (55% 15-44 years versus 50% of all adults), AB (25% versus 22%) and with kids (40% versus 33%).

However, as digital TV penetration increases, the differences will become less marked.

For instance, the 65+ figure of 17% has risen from 15% in July 2005, and presence of kids 0-15 has dropped to 35% in February 2006 from 40% in July 2005.

Figure 2 shows how the demographic profiles of each of the UK's digital TV platforms compare.

Adults in FreeView homes are likely to be older, compared to those in Sky Digital or cable digital homes, with 23% aged 65+ compared to just 14% in Sky Digital homes (which skews youngest) and 12% in cable digital home.

Cable digital homes are most likely to skew ABC1 - 63% versus 54% for Sky, 56% for FreeView.

However, FreeView and digital cable are more likely to be AB than Sky (24% versus 18%).

There are fewer homes with children in the FreeView universe than in Sky Digital or cable digital homes (28% versus 41% versus 38%),

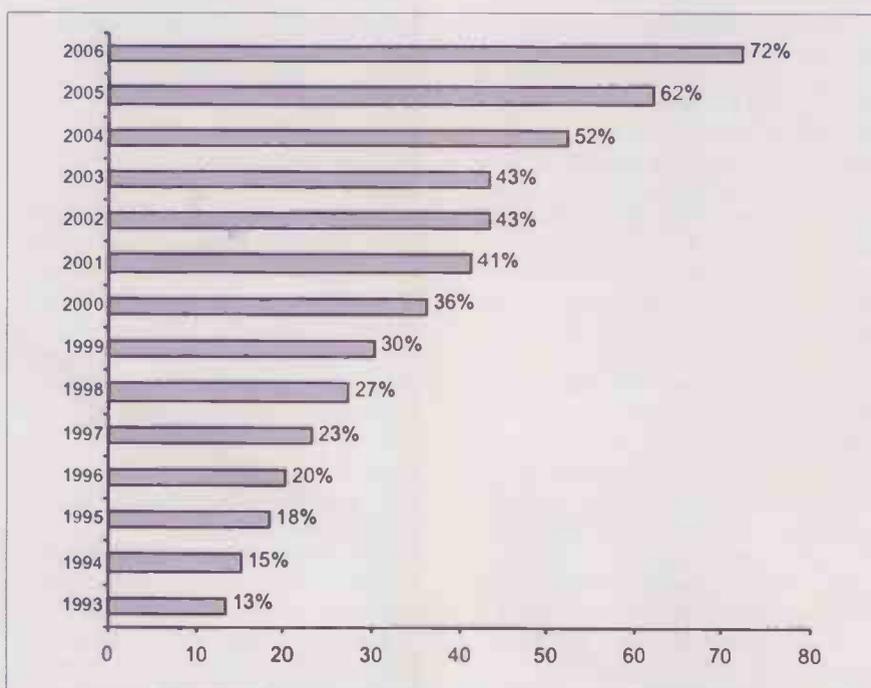


Figure 1: Percentage of UK homes with multichannel TV.

and this coupled with the bias towards older people means that FreeView is succeeding in filling a gap in the digital TV marketplace.

This is borne out by the continued steep growth in sales. Government will also be encouraged by FreeView's older skew, especially as it is now aiming for a 2012 digital switch over.

Having digital TV services that appeal to all age groups should help enable it in trying to achieve this goal.

Sky dominant

The fastest growing platform in the foreseeable future will be FreeView. However, Sky will remain dominant and is likely to make 8.7 million forecast homes by the end of 2006.

We predict some growth for cable, though some will be from analogue cable upgrades. In terms of new growth, it is likely that Sky will actually outperform cable. The overall potential market for digital TV in the next 12 months is around 20.1 million homes, or 80% of all homes.

This potential comprises all those with digital TV now and those almost certain or very or quite likely to subscribe (to Sky or cable) or buy a box (for FreeView).

It is possible that in future some Sky digital and digital cable homes will churn to FreeView. The FreeView forecast made could therefore be an understatement of the market potential.

Digital switchover

Continental Research's study investigated awareness and likely effect of digital switchover.

All respondents were asked if they had heard of digital switchover, the process of changing the UK's television broadcasting to digital. 81% were aware, though this differed by key demographics.

Somewhat surprisingly perhaps, it is the older age groups that seem most aware of digital switchover, for example nine out of 10 aged 65+ claim to have heard of it.

A reason for this may be that switchover will have more of an impact on this group of people. They are the least likely to have digital TV at the moment.

However, they are likely to be heavy TV users, more dependent on the TV for entertainment, and even company, than younger age groups, so the switchover and its associated cost is likely to have more impact, both emotionally and financially, on this older demographic compared to younger people.

	Profile of UK population with digital TV	Profile of UK population with Sky Digital	Profile of UK population with Digital Cable	Profile of UK population with Freeview
Male	50%	50%	52%	50%
Female	50%	50%	48%	50%
16-24	15%	16%	18%	12%
25-34	18%	20%	18%	13%
35-44	22%	25%	21%	19%
45-54	16%	14%	17%	17%
55-64	13%	10%	13%	16%
65+	17%	14%	12%	23%
AB	25%	18%	25%	24%
C1	31%	36%	38%	32%
C2	23%	24%	18%	21%
DE	21%	22%	19%	22%
Kids 0-15	35%	41%	38%	28%
No kids	65%	59%	62%	72%

Figure 2: profile of adults in the UK with Sky Digital, Digital Cable & FreeView.

The goal of government is to ensure that the nation will all switch to digital TV in time for analogue switch off.

However, Continental Research data suggests that a significant minority will not have converted or replaced any TVs in time and many will have second or third sets that will not be able to receive digital.

The government will need to persuade people of the benefits of digital in order to reduce this level of non conversion, and possible widespread public dissent with regard to switchover.

It may also need to consider subsidising conversion. The US government has made provision to spend \$1-1.5 billion in converting the US population to digital TV by 17 February 2009, the hard date for completion of transition from analogue to digital TV in the US.

Part of the US conversion strategy will involve the distribution of up to two \$40 vouchers per household to aid conversion to digital.

It seems possible that the UK government may need to provide similar help in the UK, particularly for low-income households.

Awareness of HDTV

All online respondents were asked: 'Are you aware of HDTV (High Definition TV)?' 66% were.

Awareness was higher amongst men (77%), 35-54's (72%), ABC1's (71%) and those working full time (71%).

All online respondents were asked to choose what feature they most thought of when they heard the term

HDTV. Overwhelmingly, 71% chose 'clearer picture'. Other benefits remain of secondary value to most.

All online respondents aware of HDTV were asked 'did you know a High Definition TV screen on its own isn't sufficient to watch programmes in High Definition?'. The proportions providing each answer were as follows:

- 41% aware you needed other HD equipment
- 57% unaware you needed other HD equipment

It is likely that this lack of knowledge about equipment requirements will prove a barrier to some in purchasing an HDTV screen.

They will also require HDTV-ready digital set top boxes that are likely to be priced at a premium in the initial stages of HDTV broadcasting.

All online respondents aware of HDTV were asked: 'how interested are you in HDTV?' Two percent claimed to already have HDTV, 7% claimed to be very interested and 36% quite interested. From this data we estimate that between 800,000 and 1 million homes will purchase an HDTV set in the next 12 months.

The Personal Video Recorder (PVR) market is currently dominated by Sky+, with an estimated 1.3m owners. Other PVRs are appearing on the market that are compatible with both the FreeView and cable platforms.

Around 1.5 million homes currently have a PVR (either Sky+, TIVO or a PVR capable of recording terrestrial channels).

A Black Mamba would be safer

Any service engineer who has been around a long time cannot help but be bemused to discover that some of the loathsome TV sets he used to have to do battle with in the early 1950s are now regarded as highly desirable collectors' items, marvels Chas Miller.

“What do you think of an Ultra 70 series TV as a collector's item?” I was asked. Frankly, the idea appalled me.

There were some pretty odd sets around in those days but one of the strangest were those in the Ultra 70 and 80 series; in fact it is difficult to see why anyone would have made them on purpose.

I hope that no one may be tempted to get hold of one (literally), because a Black Mamba would be a safer proposition.

In order to understand fully how weird the Ultra 70s and 80s were, it is necessary to look first at TV design in general at that time.

By the late 1930s mains-powered radio receivers had been around for a dozen years, and a lot of lessons had been learned.

Initially, it had been considered necessary to use intricate HT smoothing and decoupling arrangements, with one or more large LF chokes and lots of electrolytic and paper condensers.

As time went by radio designers discovered that they could cut down on these components until only a bare minimum was employed.

Old-fashioned term

You will excuse my using the old-fashioned term, won't you - old habits die hard. In addition, please forgive me, as we go along, for referring to the vertical scanning device in a TV set as the frame, and not the field time base.

In those days we had quite enough usage of the word, what with loudspeaker fields, electric motor fields and, of course the agricultural variety, to desire another.

When 405-line TV came along just before World War Two the designers immediately forgot all they had learned and went back to even more complicated HT supply smoothing and decoupling methods.

These reappeared in the post-war TV sets, which were largely rehashes of the 1939 models.

They used lots of valves, and because as yet no one had figured out how to make anything but AC mains

operated receivers, they used massive mains transformers, or sometimes more than one, to deliver large amounts of heater and HT current, plus around 5kV at several milliamps for the CRT anode.

This was referred to, with reason, as “lethal EHT”, and service engineers treated it with the greatest respect; if you did not you probably wouldn't get another chance.

Sets generally were bulky, heavy and expensive, and the only way in which they could be used on DC mains was spending more money on a rotary converter.

Now, this was a definite disadvantage as regards sales, because there was still a lot of DC around right up until the late 1950s, particularly in larger cities, which had installed tramway systems back in the early 1900s.

DC voltage

These ran on DC voltage from 400-500V, generated in large local power stations, and to realise the maximum cash return on capital the operators sold electricity as a by-product to shops and houses along the tramway routes. (Ed: I wonder if Croydon Tramlink would sell me 750V DC electricity?)

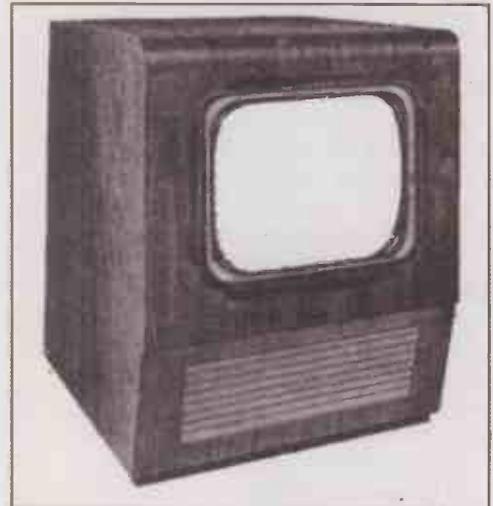
In order to reduce the voltage to a suitable level it was distributed on a three-wire system delivering (to use 500V as an example) 250V/0/-250V, with the centre wire earthed.

Consumers on one side of a road would receive 250V positive with respect to earth, and on the other side 250V negative with respect to earth.

Thus, in effect all the electrical appliances on one side of the road were wired in series with those on the other side.

An ingenious system of balancing

The Ultra 70 series TV receiver



generators at the power station maintained the voltage on both sides within close limits.

Radio sets that would work equally well on DC as well as AC mains had been common since 1934 and fifteen years later Pye at last developed, by accident, a TV set that would do the same.

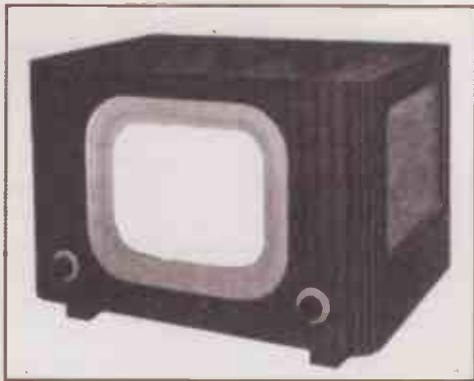
When this firm's 18T series of receivers was being designed the prime objective was to cut production costs by the elimination of expensive mains transformers, achieved by using, in classic AC/DC manner, a series-heater valve chain with HT drawn from the mains via a half-wave indirectly heated rectifier.

The EHT was derived from the line output transformer fly-back voltage, and was called 'non-lethal' because insufficient current was developed to deliver anything more than a nasty burn - or so it was said. Ho hum.

Boost diode

Another innovation was the boost diode, a means of harnessing some of the energy expended in the line output transformer to increase the effective HT, in practice by about 30V, that was applied to the LOP valve.

Curiously, the fact that these sets could be made to work on DC mains seems to have escaped Pye's notice, and when they first appeared they were advertised as for use on AC mains



Left: The First AC/DC TV Receiver - the Pye B18T...

only of 230-250V (the heater chain added up to 230V) with a step-up auto transformer available at extra cost for customers with lower voltage mains.

Dealers with customers on DC mains were not so obtuse, realising that the heater chain would work just as well on supplies of 230V upwards, and that HT voltage could be maximised by shorting out the half-wave rectifier and possibly the smoothing choke as well.

When news of these conversions filtered back to the factory, Pye realised what a potential money-spinner this was and a swift re-design of the power-supply section was carried out.

From serial number 626918 onwards all chassis were fitted with a screw-operated AC/DC switch, which in the latter position bypassed the rectifier and connected the positive main to the centre-tap of a modified smoothing choke, thus reducing voltage drop across it.

Note that the sets still wouldn't work properly on DC mains supplies lower than 230V - and there were still many in the 200-225V range - and that as with all sets with one side of the mains connected to chassis, there was a 50% chance, depending on which side of the road you lived, of the latter being live.

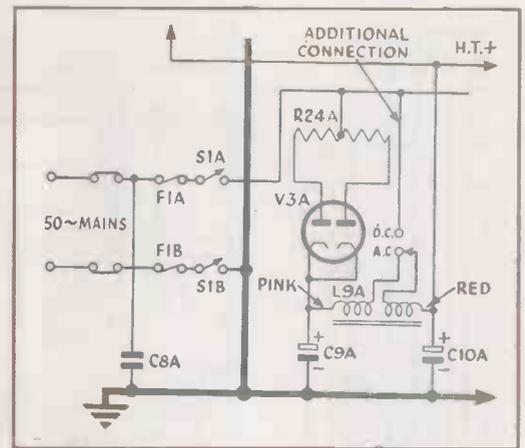
Six-inch nails

There was also the interesting possibility that if the set were plugged in 'the wrong way round' and the fuses had been replaced by six-inch nails, the main smoothing condenser might explode with great violence.

Unsatisfactory though it might be in these respects, the Pye 18T series pioneered a revolution in British TV receiver design and other manufacturers were not slow to catch on.

Before long, in most TV sets mains transformers were out and simple series heater chains and HT smoothing devices were the norm.

...and the simple modification that made it so (right).



In addition, the introduction of dual-purpose valves, notably the ECL80 triode-pentode, reduced the numbers necessary in sets and the resulting lower heater chain voltages made possible working from mains voltages of as low as 200V.

Seemingly oblivious to all this simplification of design, the engineers at Ultra Electric were beavering away at creating a series of sets using what must rank as the most grotesquely intricate and unnecessarily complicated TV power supplies ever to see the light of day.

The receiver sections weren't too bad, using as they did a super heterodyne circuit capable of being tuned to any of the BBC's five TV channels, even though not all of them were in operation at the time.

Ultra had been using Mazda valves almost exclusively for years in radio receivers and it was no surprise to find these again being specified in the vision and sound strips.

However, disdaining the series heater method, Ultra opted for valves with parallel fed heaters requiring a goodly amperage at 6.3V - except for the sound interference limiter, a Mazda D1, which had a 4V heater.

Mullard UL46

The CRT was a Mazda CRM121B, which had a 2V 1.2A heater.

Inexplicably, for the sound output stage Ultra dumped Mazda and used a Mullard UL46, a special quality version of the UL41 output pentode developed especially for use as a video amplifier.

It was intended for series operation and had a 45V, 0.1A heater.

It was back to Mazda 6.3V types for the sync separator and the line and frame oscillator stages, the latter employing a 6K25 thyratron (gas-filled triode).

What would an Ultra designer then specify for the frame output? Well, naturally, another Mullard UL46 video output pentode - what else? This, by the way, was resistance-capacity coupled to expensively-wound high-resistance frame scan coils.

The line output stage used a Mazda 6P28, a mighty valve with a 6.3V, 1.1A heater, with flyback EHT provided by a Mazda U25 high-voltage rectifier.

To demonstrate that they were au fait with some of the latest trends, the Ultra designers included a boost diode, for which they chose to employ two sections of a ponderous Mazda U810 quadruple rectifier - effectively four valves in one - with an 80V, 0.2A heater. The other two sections were used in the power supply stage, more of which anon.

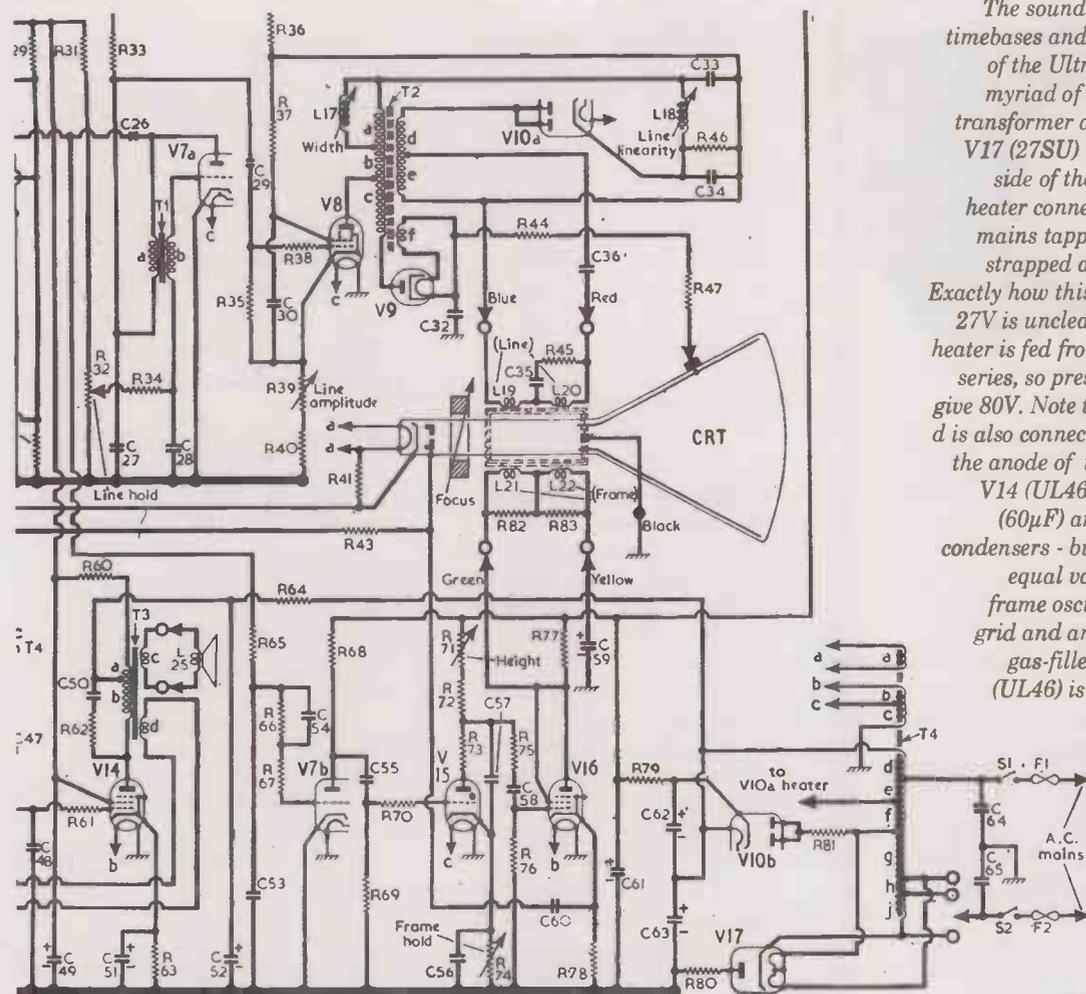
By now it will be apparent that this hotchpotch collection of valves already demanded the use of a mains transformer supplying five different heater voltages at widely differing amperages, but there was more to come.

Whilst other manufacturers had demonstrated that TV receivers could function perfectly well on HT lines of no more than 200V, the Ultra people considered that their sets needed much more.

Assuming that this really was necessary, it could have been achieved by the use of either a high-voltage secondary on the transformer or an over-wind on the primary, but these solutions were, of course, too simple.

Instead, the designers decided to voltage-double the mains, for which they needed two half-wave rectifiers.

For one of these they used the remaining two sections of the U801, whilst for the other they turned to a different valve manufacturer, AC Cossor, possibly on the grounds that someone else was due for a go.



The sound output, frame and line timebases and power supply sections of the Ultra model V70. Note the myriad of tapings on the mains transformer and how the cathode of V17 (27SU) is taken directly to one side of the mains input, with its heater connected between the 200V mains tapping and the feed to the strapped anodes of V10b (U801). Exactly how this provides the required 27V is unclear, to say the least. V10 heater is fed from windings e and d in series, so presumably these together give 80V. Note that the top of winding d is also connected, via R64 (270Ω), to the anode of the sound output valve V14 (UL46). C62 (50μF) and C63 (60μF) are the voltage doubling condensers - but why were they not of equal value? V15 (6K25) is the frame oscillator, the dot between grid and anode denoting that it is gas-filled (a "Thyratron"). V16 (UL46) is the frame output; note how its anode (strapped to screen grid) is connected directly to the high-resistance scan coils (L21 and L22), which are returned to chassis via C59 (40μF).

Dead loss

The valve chosen was called the 27SU, and Cossor must have been delighted to receive orders for it, for it had been pretty much of a dead loss to them since its introduction.

It and a line output valve called the 185BT were the sole survivors of a doomed attempt by Cossor to market a range of television valves for series operation with heaters rated 0.45A at various voltages.

That of the 27SU was - not surprisingly - rated at 27V, but it was centre-tapped to enable it to operate on 13.5V @ 0.9A, presumably in a desperate bid to lend it more appeal. This failed to work.

With this latest addition, no fewer than six different heater voltages were called for from the mains transformer.

The 2V for the CRT was provided by a separate secondary, whilst another gave 45V for the two UL46s, tapped at 6.3V for the receiver and time-base valves.

The 4V for the D1 was obtained from the same winding via a ballast resistor.

All the other heater voltages were obtained from a myriad of tapings

on the mains transformer primary.

It must already have been an extraordinarily difficult and expensive thing to manufacture, but the job wasn't finished yet.

In one variant of the series the U801 and the 27SU were replaced by a couple of Mullard PZ30s (heater voltage 52V) whilst in another variant the 27SU was retained, plus a single PZ30 in the power supply stage and a Mazda U281 (heater voltage 28V) as boost diode.

The mains transformers ended up being festooned with tapings and the job of making sure that the right ones were used in each particular chassis must have been a nightmare.

As for that voltage doubling HT supply, it produced no less than 455V at the cathode of the 27SU (or whatever might take its place - even metal rectifiers were tried).

Exercise in futility

This prodigious voltage having been obtained at no little expense it was promptly dropped back down to 335V by a massive wire-wound resistor, which as an exercise in futility would be hard to beat.

Looking back, the inescapable

impression is that the Ultra designers were simply making it up as they went along.

It seems impossible that any manufacturer should actually have put such a ramshackle design into production, but Ultra did; maybe too much time and money had been spent on research and development for the firm to be able to back out at that late stage.

Naturally, the poor old service engineer was at the sharp end when Murphy's Law (or should it be Ultra's Law?) inevitably started to take effect.

The voltage doubler also had the effect of making the 70 and 80 series chassis just about the most potentially - and I do mean potentially - dangerous ever to be let loose in service departments.

Because it was an AC-mains only set, and did not have a series heater chain, it was fatally easy to assume that the chassis was isolated from the mains as in the old genuine AC receivers. Nothing could have been further from the truth.

With the mains plug inserted one way round, the chassis was at mains voltage above earth, but this was not

too hazardous for engineers long experienced in AC/DC working and who had the ingrained habit of always checking a chassis with a neon tester before touching it.

With any normal set all you did was to reverse the mains plug, whereupon the chassis became 'dead' with respect to earth; but these Ultras weren't normal sets, and when you reversed the plug the chassis became 455V DC live to earth.

Close to death

Anything more insidiously dangerous is hard to imagine, and that is why a certain engineer came close to death in my workshop.

In the late 1950s the conversion of BBC-only sets for ITV was a big money spinner and we were heavily engaged in this work, using mostly turret tuners made especially for the purpose by a firm called Brayhead.

The workshop ITV aerial was a three-element type mounted on a twenty-foot aluminium pole set in concrete; it did not give a great amount of signal but we reckoned that if a set worked reasonably well

on it, there would be no problem at the customer's house.

There were three of us present on this particular afternoon, Frank, Ken and myself. Frank was engaged in fitting a Brayhead tuner to an Ultra, and Ken and I were outside loading completed repair jobs onto one of the vans.

Suddenly we heard an agonised shout from within the workshop and rushing in we found Frank lying flat on his back on the floor with the Ultra chassis on his chest, its CRT up against his face.

We thought at first that he was dead, but thank goodness, when we had removed the chassis and picked him up he was unharmed except for a severe shaking.

What had happened was that having tried the neon tester check and found the chassis AC live to earth, he had reversed the plug and assumed he was safe.

Then he had done the unthinkable for an experienced engineer and taken hold of the aerial plug, which was very effectively earthed via the metal pole, in one hand whilst grasping the chassis with the other,

thus receiving the 455V DC in the most dangerous way possible - across the heart.

It was a miracle that the shock hadn't killed him outright, but as it happened the intense pain caused him to fall backwards, dragging the chassis off the bench and in the process yanking out the mains plug.

Imploding CRT

Thus he'd been relieved of the electric shock by the time he hit the floor, but a second miracle had been required to save the CRT from imploding in his face, the consequences of which must surely have been fatal.

Not long before a dustman in Stoke-on-Trent had been killed in this manner.

So please don't talk to me about collecting Ultra 70 and 80 series TV sets - and if you feel you really must acquire an example, please be very, very careful and check your life insurance first.

Chas Miller is editor of The Radiophile vintage radio magazine. More details on 01785 284696.

P.J.HILL

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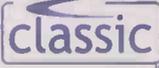
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21st Century Communications World Forum

Information and Communication Technology (ICT) Industry Leaders helped bring local academia to the International Engineering Consortium's (IEC) 21st Century Communications World Forum to discover the latest in ICT developments in March at the Business Design Centre in London.



ECI's solution enables Service Providers to offer triple play media.

The IEC's University Program, sponsored by the IEC's Corporate Members, recently gave approximately \$200,000 in grants so that local students and professors may obtain real-world learning at the 21st Century Communications World Forum.

Over 50 sessions were led by more than 200 industry experts. Attending professors could take content back to the classroom and apply it to textbook theory.

IEC Executive Vice President and head of the IEC University Program, Roger Plummer stated: "The support

and generosity of our corporate members helps build a bridge between business and academia, an integral part of the IEC's core mission."

IEC Corporate Members and contributors to the University Program include: Accenture, Actelis Networks, ADC, Agilent, Alcatel, Alvarion, Andrew Corporation, AttivaCorp, Avici Systems, BT, CableLabs, Cisco, Convedia, Detecon International, DSL Forum, ECI Telcom, Emerson Network Power, Ericsson, Excel Switching, Fujitsu Limited, Hostway Corporation, Huawei, IBM, IEE (Institution of

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Students and professors from the Dublin Institute of Technology, EuroT, Higher Institute of Industry, the Warsaw University of Technology, and many others participated in the IEC Grant Program.

Regional presence

The 21st Century Communications World Forum also had a strong regional presence with university leaders from York University, Lancaster University, University of Essex, The University of Leeds, Queens University Belfast, Southampton University and Bristol University attending the IEE special programme.

The 21st Century Communications World Forum 2006 analysed the business and technology requirements for making convergent IP communications a reality in today's world on a carrier scale.

In 2005, the inaugural 21st Century Communications World Forum drew more than 2,000 registrants. In 2005, Corporate Members of the IEC gave over 500 grants to students and professors.

Since 1996, the IEC has had participants from more than 200 universities. Since 1944, the IEC has provided high-quality educational opportunities for industry professionals, academics, and students. For more information visit: www.iec.org/about/university.html.

The IEC conducts industry-university programs that have substantial impact on curricula.

It also conducts research and develops publications, conferences, and technological exhibits that address major opportunities and challenges of the information age.

More than 70 leading high-technology universities are IEC affiliates, and the IEC handles the affairs of the Electrical and Computer Engineering Department Heads Association and Eta Kappa Nu, the honour society for electrical and computer engineers.

Cantata's Chief Technology Officer, Eric Burger, chaired a 90-

minute session on "Blending Multimedia Content: What the IMS Can and Does Achieve."

This session focused on applications that blend multimedia content, such as video messaging and multimedia gaming.

Panelists discussed how the IMS infrastructure delivered on its high expectations and enable these types of commercially-viable applications.

Real-world examples were provided, drawing from various perspectives, including Chris Haddock from Ubiquity, Christian Mari from eServGlobal and Neil Cook of Openwave.

Eric Burger is responsible for setting the technology direction for current and future next generation products for Cantata Technology.

He serves on several industry standards forums including the IETF, IEEE and SIP Forum, and is a member of the Board of Directors of the SIP Forum and the IMS Forum (formerly the International Packet Communications Consortium.)

Prior to joining Cantata, Burger co-founded SnowShore Networks. He has numerous patents issued and pending, and holds degrees from MIT and the Catholic University of Leuven.

Established through the combination of Excel Switching Corporation and Brooktrout Technology, Cantata Technology displayed its key enabling technologies for next-generation mobile and converged network services and infrastructure, including:

- The SnowShore IP Media Server, a software-based IP media server platform for next-generation networks and services.
- The Excel Converged Services Platform (CSP) 2090, a speech-enabled, carrier-grade open platform for enhanced telecommunication services that bridges existing wired and wireless networks with next-generation IP networks.
- The Excel Multi-Service Platform (MSP) 1010, high-density, scalable media and signalling platform, delivering service node capabilities and enabling voice and signalling applications for TDM and IP networks.
- The IMG 1010, Integrated Signaling and Media Gateway, enhanced to allow any-to-any network connectivity. This provides a migration path to add IP-based services to existing TDM networks and offers integrated SS7 capabilities.



Cantata Technology displayed its key enabling technologies for next-generation mobile and converged network services and infrastructure.

ECI Telecom announced BroadGate-20B, a miniature optical service access platform that functions as Customer Premises Equipment (CPE) for enterprises, utility companies and cellular operators.

The BroadGate-20B is the entry-level unit featuring a scalable architecture that provides customers with the flexibility to add more interfaces and new services as needed.

The BroadGate-20 provides telecom operators with a clear migration path from legacy services to new carrier-class data services based on its Layer 1 and Layer 2 Ethernet capabilities.

For example, the BroadGate-20 platform can be used for operating an electric company's own transmission network or operating PBX extensions between a main site and sub-stations.

Complementing the BroadGate-20B is the BroadGate-20E, which eliminates the need to remove existing equipment or buy additional equipment as the unit itself can be easily expanded to convert interfaces for the SDH/Sonet network. BroadGate-20E, will be available later this year.

Sonet network

With the growth in Ethernet data services, the BroadGate-20 allows customers to deliver an affordable mix of Ethernet, SDH/Sonet, PDH and PCM services with complete Quality of Service (QoS) and Service Level Agreement (SLA) assurances.

Complete with ECI's LightSoft

network management system, the BroadGate-20 delivers remote management capabilities with support for multiple interfaces and traffic types.

ECI provides IP service delivery solutions to the converged telecom networks, encompassing Broadband access gateways, Service Edge Routers, Optical transport, NGN VoIP and multimedia applications and services.

Top vendor

Multimedia Research Group (MRG) has ranked ECI as the top vendor for the number of IPTV Subscribers supported in Europe, based on deployments through year-end 2005.

Worldwide, ECI was ranked in second place. ECI's integrated edge to access solution for IPTV services has been deployed with top-tier carriers worldwide. Europe is the largest market today for IPTV deployments.

"ECI is well positioned with large service providers deploying IPTV networks in Europe," said Bob Larribeau, Program Director IPTV, Multimedia Research Group.

"This puts ECI in a strong position to continue and maintain its leadership position in the European Broadband Access market."

ECI's solution enables Service Providers who offer triple play solutions to deliver bandwidth-intensive services including personalized IPTV video services.

These services include Video on Demand and network-based Personal Video Recorder.



Keymile partnered with Conklin-Intracom.

ECI's Hi-FOCuS Multi Service Access Gateways, combined with the ST-series Multi-Service Edge Routers, create a single vendor solution enabling advanced IP services.

Keymile, a manufacturer of access systems and Conklin-Intracom, supplier of content delivery platforms, demonstrated Triple Play services to telecommunications network operators.

Apart from telephony and high-speed Internet access applications, the showcase

revealed how telecommunications networks can provide television in high quality with IPTV and video on demand via broadband IP networks to the subscriber.

During the demonstration, Keymile used its new Multi-Service IP DSLAM MileGate 2500.

MileGate implements Triple Play services in the access network by guaranteeing the subscriber is connected to fast ADSL2plus and VDSL2-lines at more than 20 Mbps

and ensuring efficient transmission in the Access network.

"We are glad to be partnering with Keymile in creating a solution that will meet and exceed future network needs", said Ian Meletios, COO of Conklin-Intracom.

"A robust and efficient Access Network combined with a flexible content delivery platform will ensure revenue creation opportunities to network operators for many years to come."

Conklin-Intracom is showing the Video Delivery and IP content system fs|cdn for Triple Play services. fs|cdn is a completely integrated software-based content delivery platform for IPTV, video on demand, VoIP and messaging services (SMS, MMS, Messenger).

"Our Triple Play showcase at this year's CeBIT demonstrates how service platform and access system perfectly interact to produce an ideal solution," said Heinrich Kreft, COO of Keymile.

"With our partner Conklin-Intracom's content delivery system we are providing an impressive view of tomorrow's media environment that we will supply to the subscriber with MileGate."

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RNIB calls for more TV audio description

The Royal National Institute of the Blind (RNIB) has welcomed the Ofcom research and consultation on TV access services and audio description, but regrets that it does not go far enough in making TV accessible to blind and partially sighted people.

Audio description is as important to blind and partially sighted people as subtitles are for deaf and hard of hearing people.

However, under current legislation only ten percent of all programmes on TV have to be audio described.

When the ten percent has been reached, the Ofcom targets stall, rather than continue to increase as they do for subtitling.

Leen Petré, RNIB's Head of Broadcasting and Talking Images says: "Although we welcome this research, RNIB believes that the switchover to digital in 2008 is an ideal opportunity for the Secretary of State to increase the target for audio described programmes.

"This target should be increased from 10 to 20 percent, allowing people with sight problems in the UK to get a clear benefit from going digital.

"Regrettably, Ofcom is not making that suggestion in its consultation document."

Low awareness

Ofcom's report clearly shows that over 200,000 blind and partially sighted people currently use audio description and highly value it, but that awareness of the service is still low and that there is potential for many more people to benefit from the service.

RNIB estimates that two million people in the UK currently have a sight problem, with one in 12 of us developing a sight problem by the age of 60.

With the predicted increase in the ageing population, this figure of two million is set to double by 2030.

Audio description is an additional narration that fits between passages of dialogue to describe action sequences, body language, costume and scenery to allow the viewer to understand exactly what is happening on screen.

Leen Petré adds: "96 percent of people with sight problems watch TV, yet two thirds of them struggle to follow the programme.

"RNIB believes that ambitious targets should be introduced, so that blind and partially sighted people can enjoy the same variety and quality of programmes through Audio Description that sighted people, and indeed deaf and hard of hearing people through the use of subtitling, have enjoyed for many years."

Forty two year-old Jill Whitehead, from London is partially sighted and was one of the first people in the UK to receive audio description.

She says: "I have always loved watching TV and films but struggled to understand what was happening.

"With audio description I no longer feel like I'm missing out. It's an amazing service."

Life changing

Sixty four year-old Trevor Franklin from Middlesex, says: "Audio Description means I can enjoy film and TV like my sighted friends and family and join in conversations about the latest blockbusters or TV shows. It really has changed my life."

Every day another 100 people will start to lose their sight. There are around two million people in the UK with sight problems.

RNIB is the leading charity working in the UK offering practical support, advice and information for anyone with sight difficulties.

Audio description is an additional commentary that describes what is happening on the screen or the stage for people who have difficulty seeing the action, body language, facial expressions, costume or scenery.



Leen Petré, RNIB's Head of Broadcasting and Talking Images: "Ofcom TV report is not radical enough."

To experience a clip of audio description go to: www.rnib.org.uk/audiodescription.

Audio description on digital television has been around since late 2003. The TV target for audio description is currently set at 10 percent of programmes per channel by the 5th anniversary of their digital transmission start date.

There is now one Freeview set-top box, the Netgem I-Player plus with audio description, that can deliver audio description on digital terrestrial TV.

Anyone with a Sky set-top box can also receive audio description, simply by changing their favourite language from English to narrative.

This opens up the world of audio description to literally millions of people.

As part of its review, Ofcom commissioned independent research to assess the numbers of people who could potentially benefit from different access services and the extent to which these were used.

The research indicated that nearly four million adults have hearing impairments, and 2.7 million adults have visual impairments that could affect television viewing.

More than 1.4 million adults with hearing impairments watch programmes with subtitles.

Just under a quarter of a million people use audio description services, where a separate narrative audio track describes images on screen for the benefit of people with visual impairments.

If you, or someone you know, has a sight problem, RNIB can help. Call the RNIB Helpline on 0845 766 9999 or visit www.rnib.org.uk

RadioScape boosts DMB

RadioScape has won further contracts to supply DMB (Digital Multimedia Broadcast) and Enhanced Packet Mode (EPM) infrastructure systems for Mobile TV. The company claims to be the leading provider of DMB broadcasting systems in China, according to John Hall, RadioScape's CEO (pictured)



RadioScape supplies solutions for all stages of the delivery process from the initial trial stages, where its research and test systems and field monitoring receivers are used to evaluate reception conditions in the field, through to complete broadcast installations, such as those used in the recent trials of the BT Movio service for mobile TV in the UK and in the roll-out of DMB in China.

Nick Banks, RadioScape's product manager for digital radio infrastructure, said: "The BT Movio trial demonstrates the end-to-end solutions on offer from RadioScape.

"The RadioScape Professional Broadcast system is used to multiplex the multimedia streams using Enhanced Packet Mode to ensure the delivery of rights-managed content to mobile phones.

"The phones used by BT Movio last year to prove the viability of their service received broadcasts from transmitters using RadioScape software.

"The ability of RadioScape to offer both broadcast and receiver solutions enables our customers to accelerate time-to-market while incorporating leading-edge functionality."

In China, RadioScape has just

won contracts to supply a further five multiplexers, bringing the current total number of multiplexers to nine, some of which are already broadcasting DMB Mobile TV and DAB audio.

"We are the leading provider of DMB broadcasting systems in China," said John Hall, RadioScape's CEO.

"We have been working closely with the major Chinese broadcasters over the past two years and, having won contracts with leading broadcasters in the major cities such as Beijing and Shanghai, we are confident that other broadcasters will follow their lead and specify our solution."

RadioScape now has systems that are broadcasting or shortly coming on stream at Beijing Jolon Digital Media Broadcasting, Shanghai Oriental Pearl (Group), Guangdong Yue Guang Digital Multimedia Broadcasting and others soon to be announced.

Test equipment in Korea

RadioScape has now supplied over twenty DAB/DMB research and test systems to Korea, which are being used by leading companies and research institutes to allow them to develop and plan the roll out of DMB networks and receiver products.

For example, RadioScape's portable field monitoring receivers enable broadcasters to determine the actual performance of their DMB network and compare with the predicted performance to make their network planning easier.

"Korea is leading the world in Mobile TV," added John Hall. "They have recognised that DMB provides a means of delivering Mobile TV now as it is based on proven working technology and spectrum is already available in most countries, unlike rival technologies.

"Korea has taken a dramatic lead in DMB in the same way that the UK leads in DAB.

"As a result, Korean manufacturers have a ready and growing home market for their DMB handsets so that handsets are available in volume and at competitive prices for other countries as they deploy DMB-based Mobile TV.

"For example, half a million have already been ordered to support the rollout of DMB in China."

Many other countries are following the lead of Korea and China with RadioScape recently supplying full broadcast multiplexers, trial systems, and test equipment to the Netherlands, Germany, France, Taiwan, Australia, Canada, the UK, and Slovenia.

Proven technology

DMB and EPM technologies are based on the proven technology of Eureka-147 Digital Audio Broadcasting (DAB) for which RadioScape claims to be the world's leading provider with a large number of installations around the globe, including the world's largest

commercial DAB broadcast infrastructure deployment in the UK.

The RadioScape broadcast system can be configured to support both Enhanced Packet Mode and T-DMB from software selectable options.

T-DMB can provide H.264 QCIF and QVGA sized pictures at a frame rates from 15-30 fps using 384-512 kbps and, with the Windows Media format used by BT Movio, it can be configured to even lower bit rates.

These multimedia broadcasts will cover news, music videos, sports, education, movies and the simulcast of terrestrial TV programmes.

DAB radio will also be broadcast bringing the benefits of digital clarity and a wider range of content than offered by FM broadcasting.

Founded in 1996, RadioScape's investors include Atlas Ventures, Royal Bank Ventures Investments, Scottish Equity Partners, JAFSCO, Texas Instruments, Yasuda Enterprise Development, iGlobe Partners, Psion and Arqiva.

RadioScape is headquartered in London, England with offices in Singapore and Hong Kong.

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What a life!

Donald Bullock's servicing commentary

**Manufacturers were niggardly • Programmes were pure Bedlam •
Upping the transmitted power for the advertisements only •
Sticky red wine**

John Royce's epistle in the letters column of the March issue of Television sent a few of my memory cells bustling about. For one thing it reminded me of my first job, which brought me £1.4.6d for a 44 hour week.

I am not looking for the pain of working it out now, but I seem to remember my bright-eyed employer assuring me that it was all of sixpence-farthing an hour!

I tried to look both pleased and grateful as I sat there in his office, wearing my father's shirt complete with his collar studs and cufflinks.

John recalls the early days of the television trade when we were all busily converting BBC-only sets to receive ITV as well, and refers to the Cyldon tuners, which we fitted for the purpose.

They were certainly the most popular, but how many remember those produced by Brayhead? They were a shade smaller, and, I always felt, a bit more solidly made.

In the early days of ITV there was a continuous run on the established Cyldons, which I daresay opened the door for Brayhead to compete.

IF frequencies

Both makes of tuners came in several different versions, and there were three reasons for this.

One was the multiplicity of IF frequencies that the sets of the day employed, for there was no standardisation then, and the tuner had to match. The second was that many parts of the country were in signal overlap areas.

In our part of the west midlands, BBC came in on channel 4 in some areas, and on channel 5 in others, whilst ITV came in (if we were lucky) on channel 8 or 10 (and later, channel 12).

The tuners claimed to offer thirteen channels, but the manufacturers were niggardly with the necessary 'click-in' tuned coils,

(or 'biscuits'). A tuner fitted with channels 4 and 8 biscuits, for instance, would be useless in channel 5 and 10 territory.

And the third reason was to do with the brand-type of the valves used in the set to be converted, and their valve-heater wiring arrangements.

Tuners intended for sets that used the more popular Mullard valves were fitted with Mullard PCF80 mixer/oscillators and PCC84 RF amplifiers, or UCF80s and UCC84s; while those intended for sets that used Mazda valves, such as those made by Ekco and Murphy, came fitted with a 30C1 and a 30L1 respectively.

But very often, the make of tuner we got from the wholesaler depended upon what he had available at the time, that was most nearly suitable for the conversion we had to do, and we often had the job of technically modifying the new tuner before fitting it.

This usually entailed re-arranging the tuner's valve heater wiring from series to parallel or vice-versa.

Incidentally, every engineer we knew saved any unused or 'found' biscuits, so that every workshop had a small boxful, and these we often traded and swapped amongst friendly dealers.

In those days ITV, being transmitted at Band III frequencies as opposed to those of the BBC's Band I, travelled less well, and in our area (and many others) its signal varied from weak and patchy to almost non-existent.

Tuner padders

We overcame this in some cases by increasing the gain of the tuner.

This was done by swapping the PCC84 or 30L1 RF amplifiers for the higher gain Mullard PCC89, or the even higher gain Mazda 30L15, and adjusting the pre-set tuner padders to suit their different curves.

In some cases we used to knock-up and add a further IF amplifier stage, too, using an EF80 and the contents of our junk-boxes, and when all else failed we would fit aerial-head amplifiers. In those days we had to know every inch of our territories and be competent.

A good engineer would have a pretty good idea of the ITV signal level just from being told the exact location of the customer's house.

There came the day that I was called upon to provide ITV on our family set. Not that I wanted it – the programmes and their presentation were pure Bedlam in those days.

'Double-Six'

The signal was particularly weak in our area, so I added a high gain 'Double-Six' Band III aerial to my BBC array.

Reception was so terrible that I changed my 14" Ferguson model 991 (a standard, average gain set) for a model 992, one of Fergusons' first, if not very first, to employ an extra IF stage and flywheel sync as well.

But the reception was still wishy-washy and the line would scarcely lock - until the adverts came on. Then, both the sound and vision came in loudly and clearly!

The next day I telephoned the technicians at the Birmingham transmitter and gently suggested that since they routinely broke their broadcasting agreement by upping their transmitter's power during their adverts, they might leave it so, thus making our lives in the trade a bit easier.

As we spoke my reception flew to perfection, and I thought that my persuasive powers had done the trick, but it wasn't that.

The adverts had simply come on, and the engineers there went on to utterly and absolutely deny my assertion. And that is the way they went on - upping the transmitted power for the advertisements only.

Returning to John Royce's letter, I think that John must be the first engineer whom I've ever heard to speak affectionately of Philips projection television sets.

Abominations

I hated them and all projection sets, including the abominations made by Ferranti. For one thing I detested their murky results, and for another I could never satisfactorily reset their complex optical units, as John could.

And the gloom that descended upon the workshop whenever a collapsed frame destroyed the cathode ray tube takes some describing, even today, for the tubes were mighty pricey.

Some of the newer fellows may wonder about the connection between a collapsed frame and a tube failure. The fact was that the picture tubes used were tiny, with miniature screens.

And since their images had to be magnified many times, (a bad thing in itself) the pictures they produced had to be intensely brilliant, so that a collapsed frame, being a much-concentrated strip of brilliance, could burn a line across the tube's phosphor coating in a second.

The good news was that the set-makers fitted a protection circuit which killed the tube's brightness when the frame collapsed, but the bad news was that it didn't always work, and when it did, it wasn't always fast enough, particularly if the frame output valve was pulled out of its socket whilst the set was on.

To do this was wrong, of course, but engineers tended to do it, since they were used to regularly getting away with it in the case of conventional sets.

Most television shops were small and privately owned, and very few of their proprietors used to fly into a dance of abandoned joy when they suddenly found they'd come a cropper for the expense of a new tube. In fact, some used to fly decidedly ratty, and I recall one that shot violent.

I was still reflecting upon this when, a few pages later I encountered Chas Miller's article upon his renovation of an Ekco U29 table radio, which he uses even now for workshop listening.

I recalled the day that I acquired one as a gift from a delightfully eccentric engineer whom we knew. He originally came from a life of hell in Swansea, and we called him Dylan.

I had called upon Dylan to find him working on the U29 chassis,

which he had been given.

He was 'testing' the TCC waxy paper condensers, not with an AVO or a capacity bridge, but with a pair of pliers, by squeezing them with the pliers whilst listening to the set's speaker.

The moment I told him that I had a fondness for the model, he put his pliers down and gave it to me.

These TCC condensers, which were used extensively by the manufacturers, grew leaky as their sets began to age.

Consequently, whatever fault one of these sets came in for, its performance could usually be vastly improved by replacing them.

The same applied to a similar range of Bush sets. I recall picking one up from a gentle and pleasant couple of about ninety.

Before he retired he had been the top man at the telephone exchange. They were far too sensible to want a television set, and lived for their radio reception.

Cumbersome deaf-aid

When I called he was wearing a large and cumbersome deaf-aid which used valves and consisted of an earphone wired to a large box which hung on his chest. He removed the earphone to speak to me.

"I got this because I could no longer hear the Home Service properly," he said. "It's a little better when I wear it."

I took the set to the workshop, and after repairing the fault I replaced the waxy condensers and realigned it. The difference in its sound quality was considerable.

When I returned it to him I plugged it in and tuned it whilst he busied himself assembling his hearing aid, but the Home Service came on before he had finished. He froze as he heard it, then slowly put his hearing aid down.

"Goodness me!" he cried in his quavering voice. "I can hear my wireless perfectly now! I don't need my hearing aid! What have you done to make it so clear?"

His wife joined in too, and what with their cascading praise and thanks, and their attempts to press upon me a huge tip that they couldn't afford, I shuffled out in my embarrassment.

Back to the Ekco U29. Because they were so popular, many eventually came to us for repair.

In those days Bush would have nothing to do with non-Bush agents, and we had nothing but the "Trader" service sheet that Chas referred to.

I recall the error to which he refers,

which he reproduces with his article, and his description of the correct wiring, which we had long-since drawn-out and affixed to our sheet.

'Corrected' circuit

But looking at the 'corrected' circuit detail as printed, I see that its 1947 gremlins are still alive and kicking, even if they are tripping over their beards! Such is life, Chas!

While we're wallowing in the past for a change, I'd like to mention Les Piercey, whom I first got to know as our Radiospares representative.

One day he pulled out a tiny bundle made up of short bits of sleeving, secured in the middle with a little rubber band. He pulled a couple of the strands apart and stood the bundle on the bench. "Political Prisoner!" he announced.

In his younger days he'd been a television engineer with his own little shop in Surrey, and he recalled the time that a dear old lady gave him a newly-made bottle of her home-made wine to take home with him.

As he juddered homewards through the leafy lanes of Surrey, suddenly there came an enormous explosion, and his first thought was that a mortar bomb had hit the van.

He remembered flying from his seat and hitting the ceiling before the van veered off the road and into the hedge up a bank, and he found himself spread-eagled in the back, amongst the sets, with the awful sensation of blood dripping onto his face.

As he slowly recovered he dared to open his eyes, to find that the bottle of wine had exploded and saturated everything – including him – with sticky red wine.

The reason he had called upon the old lady in the first place was to answer her service call.

She had bought a new vacuum cleaner from him a year before, and had now called him because it was no longer working properly.

When he got there he found that it wasn't sucking at all, and he checked its bag to see if it needed emptying.

It was rock-hard to the touch, and jammed absolutely solid with dust and grit, which he had to dig it out with a long screwdriver. It took him half an hour, but when he'd finished, it worked perfectly again.

"When did you last empty it?" he asked her as he was reassembling it.

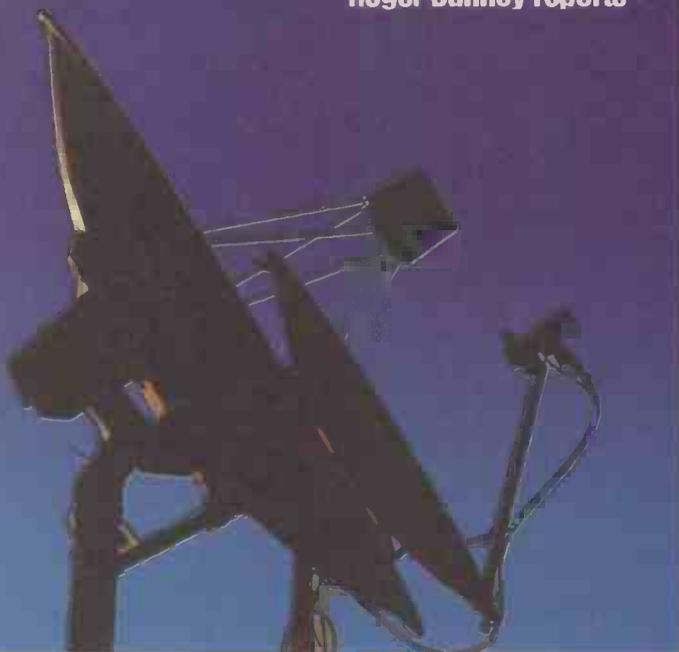
"Empty it? What do you mean?" she replied. "I've never emptied it. I thought the dust went up that lead and into the socket on the wall!"

donald@wheatleypress.com

DX and Satellite Reception

- Terrestrial DX and satellite TV reception reports.
- Broadcast and satellite TV news.

Roger Bunney reports



March 2006 has been a virtually dead period for terrestrial TVDXing activity, not unusual for this time of the year as enthusiasts wait impatiently for hopefully any mid-April Sporadic E (SpE) opening, which traditionally suggested that the SpE season proper from mid May would be a 'good one'. Sunspot activity is at a low, which over the years has often given a really good SpE year – let's hope so!

I heard from Cyril Willis recently who has been maintaining a check across Band 2 VHF-FM radio during the otherwise poor conditions.

At his home near Kings Lynn, Norfolk he receives as regular daily fringe signals the AFN (American Forces Network) service from Germany @ 98.7MHz (Grosser Feldburg mast) and also Luxembourg FM @ 100.7MHz.

At one time I used for UHF-DX reception a double stack of Short Back Fire aerials, an aerial with a wide capture area, and even at Romsey, Hampshire (in the Test Valley) it was possible to receive via Tropospheric enhancement - or aircraft scatter - fluttery ch. E25 and ch. E28 UHF-TV signals from Germany.

If you live in a reasonable location, this demanding

'scatter mode' could be a technique to explore during otherwise flat conditions.

Broadcast news

Australia. Good news for European TVDXers hoping for good F2 layer (real DX reception potential!) is that the Communications Minister has delayed the closure of analogue TV until 2010 (cities) and 2012 (country), having presented a new timetable for the conversion to 'better quality digital' TV transmissions. The delay is deliberate and will tend to match the analogue close-downs in other long established broadcasting countries.

NASA. Reflecting the above suggestions of improved F2 Layer propagation, NASA have predicted that the forthcoming solar cycle no. 24 will be up to 50% more active with the build-up commencing Autumn 2007. We are now nearing the low of sunspot activity as we reach the end of cycle 23 – so we've lots of sunspots, flares and solar storms to look forward to!

Turkey. Though there are no Band 1 Turkish TV transmitters, Band 2 FM transmissions from Turkey offers potential radio DX. The RTUK (similar to the UK's Ofcom) have just passed legislation to allow Kurdish language broadcasts over the smaller regional private radio/TV stations as from now. Previously only national coverage networks could transmit Kurdish language programming.

Morocco. Moves also to give freedom to establish new independent radio and TV stations across the country with about 5 TV and 22 radio broadcast licences being issued to those applicants that can provide a quality and sustainable service. The new commercial stations will hit the airwaves from early summer onwards, the licence winners being confirmed during April.

Kenya. Digital is not a consideration on the Kenyan horizon as the government has OK'd the move of the centrally located transmitter site in Nairobi to Limuru on the outskirts to improve reception which in turn will allow at least another 20 stations to open in the immediate region. More companies are hoping to win transmission licences but problems of adjacent channel interference have arisen due in part to limitations of the available bandwidth.

Malaysia. The main TV channel (TV1) of Radio Television Malaysia (RTM) is to move all Chinese and Tamil language programming onto TV2, leaving only the English and Malayan languages on the main national TV channel. The government's policy is to concentrate English and Malay onto TV1 as the preferred commercial languages in Malaysia – most of the younger population now speak both languages.

UK. As regional ITV as we knew it in the halcyon days of the late 50s into the 60s gradually dissolves into the anonymous national ITV network with ever decreasing regional flavour, another region evaporates. Grampian TV opened on September 30th 1961 covering the Aberdeen/Inverness and related coast-line areas but later this year is to merge with Scottish TV into the bland identity 'STV'.

Digital news

There has been a 'breakthrough' in tuner design with Microtune introducing a triple use tuner for use with analogue, digital and cable packaged onto a single small chip. The MT2131 tuner offers a high performance with specs higher than the American TV market seeks.

The reduction in external components further reduces production costs and the single integrated triple tuner package ensures a constant performance specification over the whole production process.

Over 10 million UK FreeView boxes are now in operation in six million households. This figure suggests a digital penetration nearing 70% of UK households, the highest digital user count in the world.

By end 2007, at least 11 main population centres will have commercial digital radio operational across Australia, starting with Perth, Sydney, Brisbane, Melbourne and Adelaide. DAB has originally been planned for the heavily populated areas with DRM making for digital radio coverage in the country and outback regions. The eventual digital system has yet to be confirmed.

Finland. The government has offered DTT licences for a new third national multiplex together with licences for a fifth multiplex that will go on-air after the infrastructure is complete. Multiplex 4 will eventually be used for mobile TV. The fifth multiplex will include access for two programme TV channels from Sveriges Television. Up to six national TV channels are transmitted in each multiplex. Licence application closing date was early May 2006 - the licences having a 20-year life.

Sweden. Viasat Broadcasting is a commercial TV channel and has just been given a terrestrial TV licence for an FTA general entertainment channel called TV6. Viasat will also appear on subscription satellite.

Belarus. DTT arrives by 2010 in the main centres of the Belarus with coverage extending across the whole country by 2015. At this time only a single experimental digital TV transmitter is testing in Minsk.

Meanwhile Dutch cable viewers are growing excited with the news that in June they can enjoy HDTV World Cup Football from their Sports 1 subscription channel, as can cinema buffs with offerings from Film 1. The Chellomedia cable group is negotiating with the Dutch national broadcaster NOS to take an HDTV feed, though NOS itself will not be providing any HDTV content in the foreseeable future. In nearby Luxembourg the RTL+ channel is on air in Band III DTT with programmes on ch. D07 @ 20kW ERP horizontal. This frequency was previously used for its analogue ch. E7 service from the Dudelange transmitter.

UK. DRM test transmissions continue from the Arqiva mast at Croydon and if DRM equipment was available you could tune 26.080MHz and hear WRN programming across London.

Satellite news

China. The Amdo dialect is widely used across some 60% of the Western Tibetan region though the main broadcast language transmitted from the radio and TV services out of the capital city Lhasa is the Lhasa dialect. However change is in the air with the Qinghai regional city TV service now originating satellite sourced programming, news and dubbed movies in the Amdo dialect, which should reach a potential 2.5 million audience.

ArabSat. The new ArabSat-4A satellite failed to reach correct orbital slotting when the final stage of the Proton-M rocket failed and the satellite couldn't reach sufficient height, after launch from the Russian Baikonour, Kazakhstan space facility on February 28. Engineers hope to use the satellite's station keeping own rockets to push the craft into correct orbit though much of the rocket fuel will be exhausted with such a manoeuvre, shortening the satellite's life to just a few years rather than the design life of 15 years. The 4-A craft should in correct orbit provide TV and communication services across the Middle East, North Africa and Western Europe.

India. In past years, the Indian government has been reluctant to allow foreign companies to uplink satellite programming from within India's borders. At this time Doordarshan, the Indian state broadcaster is running 30 TV channels. Currently however rules have been relaxed with some 80 companies uplinking 180 TV channels from within the Indian land mass though the government is anxious to regulate foreign satellite channels from landing their signals inside India - a rather difficult task!

KazSat will be a new satellite channel carrying news and



BBC-TV VTR clock for news VT package (AB-1)



Slobodon Milosevic funeral procession through Belgrade (W2)

programming from Kazakhstan, which will hit the air Autumn 2006. Previously the independent sat channel Caspionet has carried limited Kazakh content across Southern Russia, Eastern Europe, North Africa and Central Asia. Though no satellite is mentioned in the news brief, keep a check on Express AM22 @ 53degrees East - the programming is likely to be FTA. And Lithuania is warming to its own satellite TV channel to keep in touch with their brethren overseas, particularly in North America with a service offering specially made programmes + repeats of programming and news from the two LTV services, based around the LTV-2 main channel format.

HDTV Chinese style

The following has been lifted from the March 2006 'SatFACTS' NZ trade magazine with editor Bob Cooper's blessing and may well have implications around the world. The content originated from its contributor Lou Jun of ShenZhen Aluo-Sat (www.aluo-sat.com).

HDTV is now being transmitted in China with locally manufactured equipment available in 720P (progressive Scan @ 1280x720 pixel) and 1080i (interlaced @ 1920x1080 pixel). HDTV is also transmitted by satellite from Japan and South Korea.

AsiaSat-4 (120 degrees East) is now transmitting CCTV-HD (www.tv.cn) using three different encryption standards - NDS, Irdeto and Novel-TongFang - in C-Band, 4.060GHz-H (27500+³/₄) of up to 18 hours daily of movies, Chinese entertainment and culture.

A second movie-only channel opens soon, also transmitting HDTV FIFA World Cup footie this summer. Note: Novel-TongFang is a Chinese designed encryption standard.



French paramedics carry away injured rioters in Paris (W1)

Eager CCTV-HD Chinese viewers can go onto monthly cable subscription and buy an STB. The article shows the Panasonic TZ-CCH1000A HDTV receiver for DVB-C (C for cable but it could also mean C for Chinese standard), or you buy a DVB-S HDTV receiver and a large C Band dish. Several well-known manufacturers are already supplying receivers.

But technology now is being largely run by China. And the government in Beijing wants to go its own digital way and create its own digital standards, avoiding the compression systems used in the West such as Codec MPEG-4/H2.64 on HDTV.

This in turn means that using its home distilled digital compression standard for the Chinese HD telly they can avoid paying a lot of money for use of the West's patent rights. It is not only satellite and digital TV involved - we have the expanding mobile phone 3G TV market and that has the potential of a mega buck earner.

China is promoting the move to a Chinese domestic rather than an international digital standard by introducing 'AVS compliant Chips' initially appearing in satellite receivers later this year. As Lou Jun in SatFACTS ends: "China wants domestic digital standards, not Western ones attracting royalties".

Haven't we been here before in the early days of colour, PAL and Telefunken patent rights?

Thanks to SatFACTS for this important information.

Satellite sightings

One of our established satellite enthusiasts, Edmund Spicer from Littlehampton, has reported that there is a South American multiplex available on Eurobird @28¹/₂ degrees East, which should be easily received across the UK as signal levels are high.

I checked and sure enough, the multiplex is easily found @ 12.633GHz-Vertical (Symbol Rate 6109 + Forward Error Correction ³/₄).

There are four TV channels present: Venevision, TV Chile, Red Panameric and TV Columbia. This will provide a glimpse of South American TV and culture. From time to time News Equipe also appears on the same satellite @ 12.613GHz-V (6109+³/₄) with news feeds. Though so far I have seen no action, the slot can be easily found.

The former Serbian leader Slobodan Milosevic died in Holland in mid-March during his prolonged trial at The Hague for war crimes. Despite the rumours of poison, he had died of heart failure.

Updates on the situation appeared over Eutelsat W2, 16 degrees East via B-92 @ 12.559GHz-H (5632+³/₄) but on the 15th his body was flown out and back to Belgrade. His body lay in state for a couple of days and after a period of lying in state the funeral took place on the 18th, his body was carried to the burial through the streets thronged with grieving supporters.

Eutelsat W1, 10 degrees East carried footage of the cortege

as it struggled through the crowded streets @ 11.098GHz-V curiously running with the American standard NTSC.

Atlantic Bird-1 over at 12¹/₂ degrees West carried a rich variety of video content and a remarkable live two-way interview, or a contribution insert into a programme, was noted the evening of March 18th when an Arabic gent in a London studio was commenting on the American occupation of Iraq.

Only the outgoing feed could be heard and seen but clearly he was convinced that the Yankees were losing the war and being kicked out of Iraq, and that the freedom fighters were gaining strength daily as many joined the fight for freedom, and similar commentary.

Meanwhile in Paris and other cities the youth were rioting in the streets over new employment laws, with familiar scenes of riot police rushing the crowds, tear gas and cars on fire.

W1 carried prolonged live video footage of Paris rioting on the 18th March over 10.972GHz-V (4167+5/6) both from hand held cameras within the crowds and from high buildings. Days later the riots continue.

Earlier that evening over W1 'IRIB Feed from LONDON', a caption superimposed over colour bars preceded an interview - 11.020Ghz-V (6076+7/8). IRIB is the broadcasting service in Tehran, Iran.

The Thor/Intelsat slot 10-02 @ 1 degrees West carries a vast number of Scandinavia cable and subscription channels but the 11.495-11.750GHz-V bandwidth is generally dedicated to programme and OB feeds.

The BBC normally carries its TV circuits over Atlantic Bird-1 but the Question Time outside broadcast programme was transmitted back to TV Centre London on March 16th at 2100 hours for recording in and later playout into the BBC1 evening schedule.

The OB feed running MPEG 4:2:2 downlinked @ 11.511GHz-V (6076+7/8). This was similar to my TVS days with the 'Questions' programme in the late '80s, with the programme being linked back to the studio for recording and later playout at the appropriate scheduled time.

The programme was also recorded on site lest (shock, horror!) the studio recording failed and we as the crew would have to stay at the remote OB site for live playout at the scheduled time.

The regular 1 degrees West ABC Scopos feeder from Baghdad into the NY studios that disappeared during March mysteriously reappeared a few days later @ 11.675GHz-V (5632+³/₄) - this normally carries either VT packages, live interviews or the rear window view from the ABC Baghdad office both day and night.

Intelsat 10-02 carried several programme feeds from a conference centre the afternoon of March 25th using different satellite uplink trucks. Both the 11.530 and 11.556GHz-V slots were active courtesy of Prokam-DSNG2 truck (suspected German) and the Swiss SUI 15 Coder 1 truck appeared at 11.511GHz-V (all were running 6109+³/₄).

All the pictures from the lecture or demonstration room featured a large X with the title across it: 'DIE WAHL Bei Uns'. Having no working German knowledge perhaps a reader can enlighten me - perhaps the local elections? (Ed: This translates to: 'The choice with us' at <http://babelfish.altavista.com/>).

A final note on the weather this year in the UK: Europe has been exceptionally cold. There have been several tragic roof collapses on public entertainment venues with high loss of life due to snowfalls.

The snow, and not the rain, has fallen 'mainly on the plain in Spain'. Amazing pictures over Atlantic Bird-1 on 12.699 and 12.703GHz-V (3500+³/₄) from the Spanish sat truck Retevision E79, which transmitted pictures of itself trapped in snow, having slid on packed snow and ice, and the engineer trying to dig the vehicle out of the snow drift.

With many Brits moving out to a sunny Spain anticipating a

golden sunset in their retirement, it seems that the so-called Global Warming may be producing Iberian winter weather akin to Aberdeen in December – retirement in the Shetlands might be a better choice!

Welsh TV history

In the beginning there was TWW, Television Wales and West, which hit the commercial TV airwaves from the St Hilary transmitter of the ITA on 14 January 1958 using the System A 405-line standard on channel B10 vertical @ 200kW omni-directional.

The ITA had encountered problems in siting its transmitting mast and having reviewed many different locations opted for St Hilary Down, between Swansea and Cardiff. Even then, objections from the air industry, the nearby Rhoose airport, resulted in the anticipated 1,000-foot mast being reduced to 750 feet in height, the site itself being 400 foot ASL.

Programmes from TWW were sourced from its new studio centre at Pontcanna, Cardiff in English over channel 10. Another transmitter at the St Hilary site was commissioned to transmit a Welsh language service on channel 7 @ 100kW vertical (directional aerial), though the lower power and aerial height resulted in less effective coverage than its big brother on channel 10.

Coverage on channel 10 in the West of English reached from Shaftesbury/Devizes in the East, Honiton in the South (though I recall TWW aerials in the Sidmouth area for ch. 5 Wenvoe + ch.10 St Hilary pre-Westward TV) and optimistically Milford Haven/Tenby in the West.

The deep valleys of South Wales produced their own difficulties though locations up to 40 miles North obtained acceptable reception from the 200kW ERP transmitter.

Four years on and commercial TV came to West, Central and North Wales in the guise of Wales West and North Television, its on-screen logo: Teledu Cymru.

This is a difficult region to cover - sparse population in mid Wales (Powys) and an extreme coastline between the West Wales peninsula (Dyfed) and the Llyn Peninsula and populated North Welsh/Anglesey coastal region Gwynedd + Clwyd). Commercial TV arrived but with severe technical problems. The transmitter covering West Wales was sited at Presely on ch. B8 horizontal at 80kW (North)/100kW (East) output from the 770-foot mast – the site itself is 1100 foot ASL.

The Northern 80kW beam along the coast also gave adequate signal input to the Arfon transmitter site, 950 foot ASL, which received and re-radiated the Presely output signal on ch. B10 horizontal at 10kW maximum ERP from a 1000-foot high mast.

The Arfon radiation ERP pattern varied in direction to achieve certain coverage objectives while minimising co-channel interference with other services.

The Moel-y-Parc transmitter near to the Welsh/UK border at Chester received Arfon output via another RBR link (Arfon to Nebo, Anglesey off-air and a microwave link to Moel). Moel transmitted in a semicircle from SW through NW, thus minimising overlapping signals into England.

The main studio centre for WNW was in Western Avenue, Sofia Park, Cardiff, about one mile from the TWW studio at Pontcanna. WNW also operated a small news contribution studio at Bangor, North Wales.

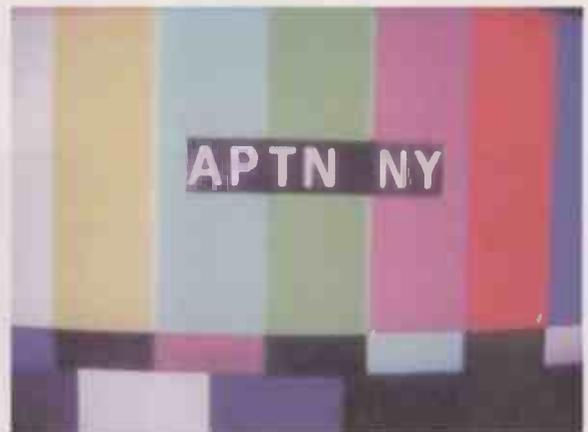
The franchise ruling was that WNW must self-produce at least 10 hours of local programming with other Welsh and English programming being supplied from other ITV contractors such as TWW and Granada.

Though a difficult area to cover, the Welsh commercial TV channel from Wales West and North TV (Teledu Cymru) went on-air 14 September 1962 from Presely and the other transmitters followed later in 1963.

Unfortunately financial difficulties grew as the Arfon and



APTN test card ex NY bureau (W1)



State banquet, London, 7th March (W1)

Moel-y-Parc transmitters came on-air, despite the on-going supply of programming from the main ITV network companies.

Granada eventually pulled the plug on Welsh programme making for WNW which spelt the end of WNW, TWW then came forward with attractive financial offers to the WNW group and its shareholders which was gratefully received and TWW assumed control of the whole Welsh commercial TV network at the end of January 1964. They maintained the Teledu Cymru station name over the former WNW network until 1968 when it disappeared into television history.

Though TWW produced much of the programming for WNW and then bought them out and took over the whole Welsh countryside, fate was to play its hand in the shape of the ITA who in June 1967 advised TWW that its franchise application was not successful and Harlech Television was wheeled into the frame.

The franchise changeover was far from amicable and TWW eventually sold off the remaining six months of its franchise operation to Harlech. It is interesting to note that WNW was just beaten on-air by Channel Television which itself presented a considerable challenge in the method of obtaining acceptable network ITV signal reception over the English Channel. Channel TV opened 1 September 1962.

The BBC also had a split coverage arrangement in Wales with the main BBC English language service from Wenvoe on channel 5 and BBC Wales also from Wenvoe on channel 13.

The main channel 5 Wenvoe output covered a wide area both across South Wales and into the West Country, offering acceptable reception on high ground in mid Hampshire. (I saw my first TV pictures in the valley hometown of Romsey in the early 50s before the arrival of the local Rowridge IW transmitter).

Audio recording with Soundtrack Pro

Boris Sedacca delves into the audio recording features of Apple's Soundtrack Pro within Final Cut Studio.

Last month I looked at some of the ready-made loops within Soundtrack Pro and assembled some tracks. This month I am looking at the impressive audio recording features, which are surprisingly comprehensive.

There are several ways you can get sound into your Mac, depending on your budget. The latest state-of-the-art mixing desk with FireWire connectivity costing several thousand pounds is obviously the preferred method, but if like me, your budget is limited, then you may have to resort to a cheaper audio mixer and USB audio converter.

I bought the Fostex VM04 digital mixer shown below a few years ago for about £170. It has its own EQ and DSP and offers a range of I/O interfaces and simple analogue-type operation with scene memory automation.



The VM04's interfaces include a pair of trimmable mic-level inputs matched with two line level outputs, each with individual panning and two-position shelving-type EQ, effect sends digital/analog stereo outputs and high-quality 30mm faders.

An S/PDIF-format optical digital output is provided as standard. The mixer incorporates 20-bit A-D converters, 24-bit internal data processing and 44.1 kHz operation. The rear view shown below shows a mic plug inserted in the first trimmable mic input.

Starting from the left, the first socket is for the power supply, followed by the S/PDIF socket. The rest of the sockets are fairly self-explanatory. Instead of using the analogue stereo outputs, I prefer to use S/PDIF, because I believe it provides better signal-to-noise performance.



The next photo shows an optical cable inserted into the S/PDIF socket at one end, and into a Roland Edirol UA-1D USB to digital audio interface, which provides up to 16-bit/48 kHz, at the other end. It can handle both S/PDIF coaxial and optical input/output connectors and

supports 5.1 ch surround output through S/P DIF (Dolby DIGITAL and DTS).



The USB connector goes into one of the USB ports on the Mac. When you load up Soundtrack Pro, you need to ensure that you have the correct input and monitor devices selected in the recording window at the top left of the screen,

as shown in the screen grab on the right. Then you need to ensure that the system itself is set up for recording with the Edirol device. This is done by going to the Finder and selecting Applications, then Utilities and then Audio Midi Setup, and then selecting the edirol device as the default input as shown in the next screen grab below.

If you are using a 44.1kHz input stream such as that provided by the Fostex VM04, then you need to select that as the audio input format instead of the default 48kHz. It took me a while to figure that out because at first, when I recorded a track, it seemed to shrink itself when recording ended, and then played back at a higher pitch.

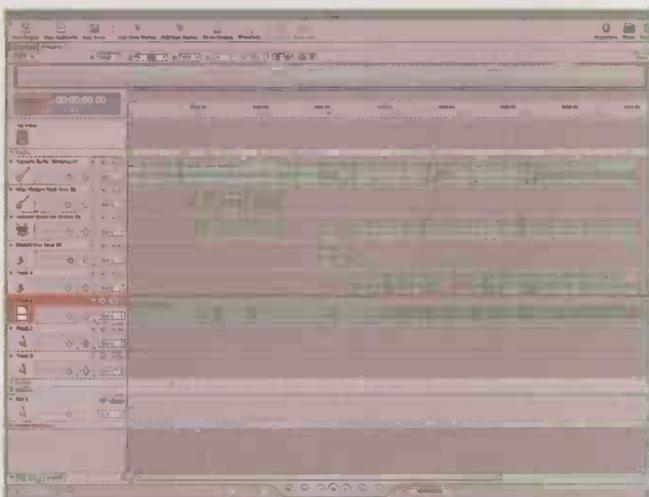


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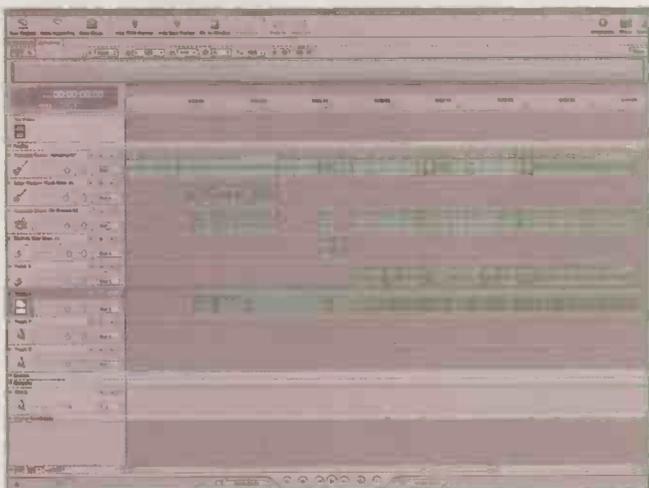
Last month I posted up some MP3s at www.televisionmag.co.uk/MP3. The next screen grab shows the Soundtrack Pro project for A.MP3, which shows five tracks with ready-made loops drooped in, plus a new audio track of a blues harmonica recorded on track 6.



Note that this is one single long audio segment, and the default graphic at the extreme left of the track shows a waveform. In order to record a track, it first has to be 'armed' for recording by clicking on the red record button for that track, and then clicking on the red record button of the 'tape transport' mechanism at the bottom of the screen.

I have subsequently recorded additional tracks, all from a blues harp, and then spliced out the dodgy bits and kept the good bits to produce the new mixdown (see the May section at the website referred to above).

The next screen grab shows the beginning of this process, with the first 30-odd seconds cut from the sample.



At this point, I am going to introduce the mixer, which gives greater control of the stereo image, and allows you to add effects to enhance the sound of the audio track.



I have selected two effects, 'overdrive' and 'tape delay'. You can use more than 50 professional effect plug-ins to enhance a track, recreate the reverberant ambience of any space or create sound effects.

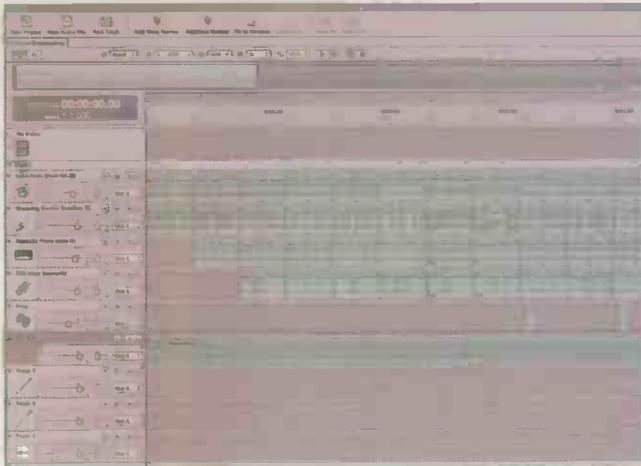
If you are an advanced user, you can also use AppleScript to create batch processes for tasks you perform frequently, such as format conversions, noise reduction and normalisation.

Soundtrack Pro provides intelligent analysis, repair and restoration functions for clicks and pops, power line hum, DC offset, phase, clipped signal and silence, as well as audio time stretching without affecting pitch.

It also provides support for bit depths up to 32-bit float, support for sample rates from 2-192kHz, and AIFF, WAV, MP3, SDII, NeXT, QuickTime and STAP (Soundtrack Audio Project) file playback support.

Processes include Fade in/Fade out, Normalise, Amplitude adjust, Silence, Invert, Swap channels, Mono conversion, Resample, Generate silence, white noise, pink noise, sine wave, sawtooth wave, square wave or triangle wave. As you add effects to your audio clip, Soundtrack Pro animates the timeline in a corresponding manner. Over time, knowing just which effect to add will become more and more intuitive as you use more senses to analyse your desired outcome.

You can use beat- or time-based markers or import scoring markers directly from Final Cut Pro 5 to sync your soundtrack, something I will return to in future months as I get to grips with the other applications within Final Cut Studio. Meanwhile, the next screen grab shows a longer version B.MP3 with added 'frog' sound loops and flute track.



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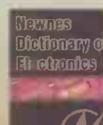


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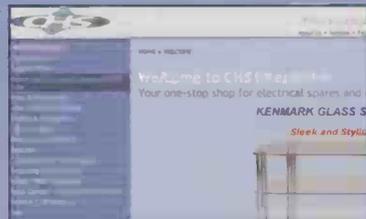


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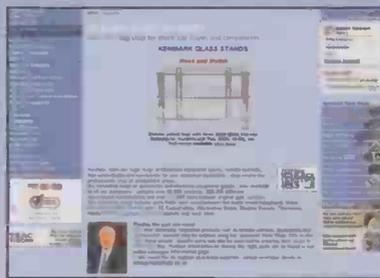
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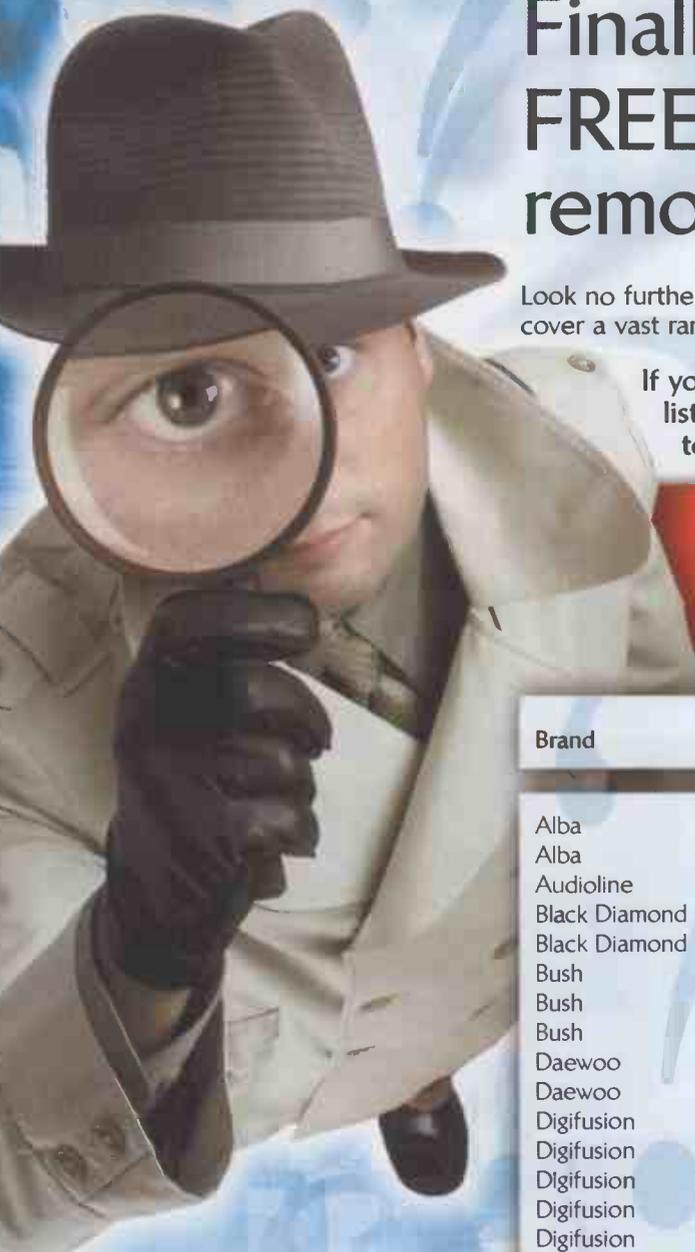
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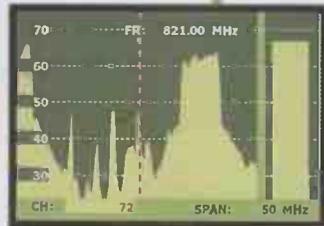
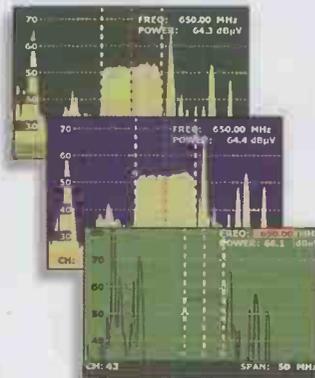


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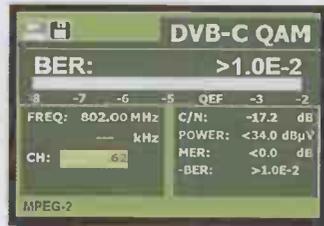
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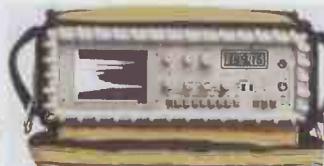
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