

# TELEVISION

AND CONSUMER ELECTRONICS

OCTOBER 2006

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## Plasma market overview

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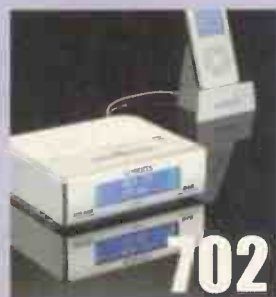
Tony Greville

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# TELEVISION

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## NEW ADDITIONS

First of all I would like to thank all of those who have contacted me over the past few weeks with your views on the magazine and the industry in general. It has been a busy few weeks and this month's news section carries stories on everything from revolutionary pixel technology, Pioneer and Sky HD experiencing compatibility issues to Apple getting in a stew over patent disputes.

This month also sees the introduction of some new features which I hope you will find of interest. The first is a long running series of articles by Mike Tennant, of TAVCOM, specialist training organisation from the CCTV sector. Mike started out as a TV engineer and believes there are many opportunities for experienced TV bods in the CCTV sector (see page 710). The second is another long running series, this time from the Custom Electronic Design and Installation Association (CEDIA). This is the industry body which represents the interests of the custom installation and home automation sector. This is another area where switched-on engineers could make important extra revenue (see page 712).

Fear not however, there are no plans to abandon the TV and consumer electronics service and repair core of the magazine. However, few businesses can afford not to be flexible in these fast moving times and these areas could provide useful extra revenue. Keep an eye open for similar additions in the coming months.

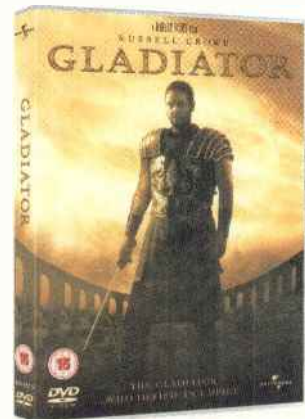
This month also saw a lot of news surrounding the next generation high definition (HD) disc formats. This could be good news for service and repair specialists. If the machines take-off, they will deliver onto the market a range of high-quality products outside the commodity/throw-away categories that have been prevalent of late.

**Daniel J Sait**

Editor

## READER COMPETITION

To celebrate the launch of Dolby's next generation of audio codecs (Dolby Digital Plus and DolbyTrue HD, see page 700) *Television* is offering one reader the chance to win the top ten 'best sounding' films of all time as voted for by the users of Amazon.com. As the prize includes both the *Star Wars* and *Lord of the Rings* series, this adds up to a mouth watering 17 films worth over £300. To have a chance of being picked out of the hat, send in your comments on the magazine or the industry in general, including name, address and phone number, to [daniel.sait@nexusmedia.com](mailto:daniel.sait@nexusmedia.com) or [TVeditor@nexusmedia.com](mailto:TVeditor@nexusmedia.com)



Are you not entertained! *Gladiator* in one of the top ten 'best sounding films' of all time that *Television* readers have the chance to win. The others are, *Star Wars* series, *Lord of the Rings* Trilogy, *Jaws*, *Saving Private Ryan*, *Titanic*, *King Kong*, *Jurassic Park*, *War of the Worlds* and *The Matrix*.



Polymer gratings could create more realistic blues and greens (picture Universal, Jurassic Park 3)

## Full spectrum TV a reality

Researchers in Switzerland claim to have developed technology that will allow TV screens to produce the full spectrum of visible colours. Work at the Swiss Federal Institute of Technology has produced prototype pixels that change colour as special polymer is

activated. The process allows different wavelengths of light to escape generating the full spectrum of colours within white light.

The polymer is arranged in special screens called diffraction gratings which are already used in projector systems or fibre optic

telecommunications.

The prototype consists of arrays of 10 pixels, each 80 micrometres across. The diffraction gratings consist of a piece of the polymer covered with ridges tipped with gold. When white light is shone at the polymer from one side, it reflects out of the polymer screen and is also split into different wavelengths. A slit above the polymer then ensures that only one wavelength of light escapes, which gives the pixel its colour. However, because the special polymer contracts under voltage, the fan of light-waves can be moved which changes the colour that is fed through the slit. The team behind the research are working on pixels that mix the output of three tuneable gratings to produce the full range of visible colours. Work is also being done on lowering the voltage required to make the system work, currently at around 300V.

## Pioneer ramps-up plasma production



Reports from Japan suggest that Pioneer is planning to establish a new plant for the manufacture of plasma TVs. The project is expected to be located in the country's Yamanashi Prefecture and could be in production by the time the company begins its next fiscal year. The move is being seen as a bid to maintain Pioneer's 10% global market share in Plasma TV in the face of stiff competition.

The facility is expected to be able to produce one million plasma TVs each year. Coupled to the company's existing sites, this should boost Pioneer's annual plasma capacity to around 1.7 million units by fiscal 2009.

Conversely, some reports have suggested that Sony plans to exit altogether the Plasma market. IT web-site *Digitimes* quoted Katsumi Ihara, executive deputy vice president of Sony's procurement strategies and TV and video business, as saying that the company planned to stop producing Plasmas, but planned to ramp-up shipment of 40" and over LCD TVs.

## Next generation Dolby

Dolby has announced details of its next generation surround sound audio codecs, Dolby Digital Plus and Dolby TrueHD. The company says Dolby Digital Plus offers greater fidelity, more surround sound channels (7.1 on HD-DVD and Blu-ray) and less compression artefacts than DVD Video. Dolby Digital Plus operates at 24bit/96kHz and up to 6Mbps although this is limited to 3Mbps on HD-DVD and 1.7Mbps on Blu-ray (Dolby Digital is 448Kbps on DVD 5.1). The codec is a mandatory feature of a HD-DVD disc and currently optional for a Blu-ray disc.

Dolby says that TrueHD

technology delivers true high-definition sound, with lossless audio quality that is bit-for-bit identical to that of a studio master recording.

TrueHD can support up to eight full-range channels of lossless surround sound and supports 24bit/192 kHz in a 5.1 mix at up to 18Mbps or 96kHz in a 7.1 set-up. Again the codec is mandatory for a HD-DVD, but is currently optional on a Blu-ray disc.

Both systems are included

Summary of Dolby codec support in each format

Codec	HD DVD		Blu-ray	
	Status	Ch / Max. Bitrate	Status	Ch / Max. Bitrate
Dolby Digital	mandatory	5.1 / 448 k	mandatory	5.1 / 640 k
Dolby Digital Plus	mandatory	7.1 / 3.0 M	optional	7.1 / 1.7 M
Dolby Digital Plus	mandatory	2 / 504 k	mandatory	5.1 / 256 k
Dolby TrueHD	mandatory	8 / 18 M	optional	8 / 18 M

on the as yet unreleased Toshiba, HD-XA1 and HD-A1 and Panasonic's DMP-BD10 Blu-ray player. Again, both codecs are mandatory for a HD-DVD player and optional for a Blu-ray player. However, it is difficult to see why any Blu-ray deck manufacturer would not include both.

## European commission probes HD format licensing

The EU is to look into the licensing structures for Blu-ray and HD-DVD.

A Commission

spokesperson told *Television* that a request had been sent to the, "...founders and promoters of Blu-ray and HD-DVD

(including Sony and Toshiba) as well as the major studios asking for information on the licensing of both formats."

The Commission stated it was too early to say whether the enquiry might lead to a full anti-trust investigation and it was waiting for replies from the major stakeholders before making any further comment.

Without details of the communication sent by the Commission, what precisely it is concerned about is difficult to say. However, possible issues could be the 'encouragement' of studios and tech companies to support both formats or the use of a strong position in a related market to drive sales, such as Sony putting a Blu-Ray drive into the PS3.

Toshiba did

not come back with an official response and Sony are keeping tight lipped also.

Meanwhile a new report from Screen Digest, specialists in analysing trends in audiovisual media, has offered its view on what will happen as Blu-ray and HD-DVD compete for centre stage. The report concludes that the most likely outcome is that neither format will achieve a 'knock-out' position of market dominance. The report believes both will coexist until combi-format solutions become cost-effective and eventually dominate, mirroring the current market for recordable DVDs.



The future of HD-DVD and Blu-ray is uncertain

## Apple crumbles on patent dispute

Apple has agreed to pay £52 million (\$100m) to rival music player maker Creative in a long-running patent dispute.

Regulators began looking into the dispute in June after Creative accused Apple of using its patented technology, namely the sorting software used in its own Nomad and Zen players, in the iPod.

In the deal, Creative has agreed to accept the £52 million in return for licensing a software patent to Apple for use in all its products.

Creative also will be permitted to produce accessories for the iPod,

significantly expanding the company's market potential.

The move follows a tough period for Apple which has seen product recalls on some laptop batteries and accusations of unlawful working practices at one of its Chinese manufacturing partners.

Creative has won a patent dispute with Apple



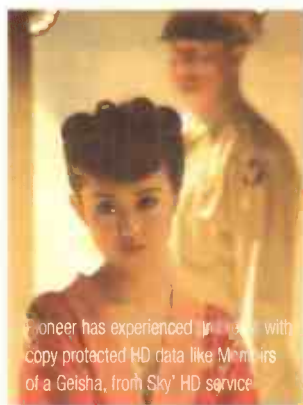
## Compatibility issues

Some Pioneer plasma screens are experiencing compatibility problems with the Sky HD service.

The problem affects a small number of Pioneer sets (4th, 5th and 6th generation screens) and occurs when viewers try to access copy protected channels via HDMI. The problem appears to be related to the copy protection system for HD High Bandwidth Digital Content Protection (HDCP). The problem manifests itself by loss of picture and a screen message stating: 'This display does not support HDCP'.

Whether the problem lies in the Pioneer machine or the Thomson-made Sky box is not clear at present. For now the problem can be solved in two ways, either a free component cable through Sky or a free call-out from Pioneer.

Sky's official response to the issue states: "We're working closely with Pioneer to



Pioneer has experienced problems with copy protected HD data like Memoirs of a Geisha, from Sky's HD service

investigate a problem reported by a number of Sky HD customers with Pioneer TV screens.

"Before Sky HD launched, we ensured that the Sky HD box had passed independent tests for compliance with industry protocols and we tested it with more than 75 different models of TV."

Pioneer's official line reads: "UK customers owning a Pioneer Plasma TV, with a confirmed HDCP compatibility issue, following connection to a Sky HD Box, will be entitled to an FOC repair undertaken by a Pioneer plasma authorised service centre."

# Fujitsu offers high-performance PVR chip

Fujitsu Microelectronics Europe (FME) has announced the release of an integrated MPEG decoder that combines high-performance with complete PVR functionality.

The SmartMPEG-E (MB86H30) is the latest member of Fujitsu's MPEG decoder family and incorporates advanced features, such as high-speed USB 2.0 and On-the-Go (OTG) functionality, which allows connection to an external host device and OTG products.

In host mode, the MB86H30 can control slave devices, such as hard disk or USB Flash, while in device mode the decoder can be controlled from a PC.

It is possible to connect one hard disk via the ATA interface and another hard disk or USB Flash drive via the USB 2.0 interface, with the ability to transfer video/audio data between these devices.

FME says high-performance is provided by an ARC Tangent-A4, six-channel DMA controller, supported by a fast



FME's SmartMPEG-E delivers multi-functionality to PVR builds

memory system that allows faster read and write speeds. The device comes with comprehensive PVR middleware and drivers from FME, which the company says will enable faster design-in and a quicker time-to-market for developers. The single-chip solution is also designed to reduce power-consumption and lowers overall costs.

A wide variety of viewing and recording modes is offered for PVR implementation. One channel can be recorded and another channel can be

viewed in Time Shift mode, or two channels can be recorded while viewing one from the hard disk or a live stream. The two video decoders also support Picture in Picture (PIP) mode, where two programs can be decoded and displayed at the same time. This allows the viewer to watch one program and see the actual recording in the PIP. The Fast Mosaic Mode allows the display of multiple pictures on the screen, with one running in real-time and the others updated every 2 seconds.

# TV Licensing evasion hits all time low

Evasion levels have dropped to an all-time low of 4.7%, according to TV Licensing estimates. "We're netting more than 1,100 people a day," said TV Licensing spokesperson Chris Reed, but he added that that, "...fewer people than ever are dodging the licence fee."

More than 200,000 people were caught watching television without a valid licence in the first half of 2006, the TV Licensing agency reports. Around 12% of those were in London with Glasgow providing the next largest figure with around 5%.

Most evaders come from big cities with Birmingham and Manchester also in the top five.

However, TV Licensing says it has stepped up efforts to find people who are avoiding the licence fee in rural areas by adding motorcycles and 4x4 vehicles to its fleet of detection vans.

Mr Reed said that evaders had been caught, "from the Scottish Highlands, to the southernmost Channel Islands".

# Dixons ditches analogue radio

Dixons is discontinuing the sale of analogue radios from its on-line site [www.dixons.co.uk](http://www.dixons.co.uk). The decision follows substantial growth in the sale of digital radios,

currently standing at 30 to 1 through the group's internet store.

Dixons says the move has been driven by improvements to coverage of the DAB signal, better availability of stock, new portable models, investment in new transmitters and the need to reflect the early adopter profile of its on-line customer base.

Nick Wilkinson, group managing director for Dixons, said: "The growth in demand for digital

radios is further evidence that we're living in the digital age."

Other products on Dixons 'endangered species' list include the personal CD player and the so-called "boom box", reflecting the changes that MP3 players are having on the portable audio market.

Dixons has announced it will only sell digital radios like Robert's CRD19





# Sony simplifies camcorder recording



The DVDDirect family transfers content to DVD without a PC

Sony has released details of two DVDDirect recorders which allow users to transfer video and photo data direct to a DVD.

Both models, the video and digital photo-capable VRD-MC3 and the video-only VRD-VC30, provide a 'PC free' way of archiving data as well as featuring built-in LCD control screens, multiple interfaces and fast real-time DVD recording. The DVDDirect recorders work with

virtually any type of camera or playback device, including non-Sony brands.

Various digital and analog video inputs mean that users can connect tape, DVD or HDD (hard disk drive) camcorders. DVDDirect can also hook-up to HDD based digital video recorders (DVRs) and VHS video cassette recorders to maximize the amount of sources the recorders can handle. The connection

suite includes Hi-Speed USB 2.0, DV digital video (i.LINK /FireWire/ IEEE 1394) and analog S-video and composite video inputs. The VRD-MC3 recorder also features Memory Stick and Memory Stick Duo, Compact Flash, Secure Digital (SD), and xD card slots and can connect directly to PictBridge™ compatible photo printers.

Both models support Dolby Digital 5.1 surround sound as well as 4:3 and 16:9 aspect ratios to preserve the full quality of the original video footage. The multifunction VRD-MC3 recorder boasts a 2.5" colour LCD for easy previewing of video and images when used in stand-alone mode.

# Toshiba recalls LCD TVs

Toshiba LCD televisions; 14VL44B, 20VL44B, 27WL46B and 30WL46B have been recalled due to a potential safety issue concerning the plug and cord set.

The sets with the potentially faulty BETTER WIRE plug and cord set-up were on sale from September 2004 to August 2005.

Users in possession of any of the sets should be advised to turn off the TV immediately, disconnect it from the mains and not to use the TV until a replacement plug and cord set is supplied.

Owners can telephone the free Toshiba customer care line in order to obtain a replacement plug and cord set and arrange the return of the Better Wire plug and cord set on 0800 33 43 53.

In the republic of Ireland the number is 1800 777 000.

Toshiba says that in certain rare circumstances, it is possible that these BETTER WIRE plug and cord sets could melt, causing a small risk of injury and/or fire. However, the risk is low and no injuries have been reported. Only models which are equipped with a BETTER WIRE plug are affected.

# iTunes could be hardware 'Trojan Horse'

According to ABI Research, analysts in broadband and multimedia, Apple's iTunes service has the potential to allow the company to enter the hardware sector of the home A/V market ahead of its competitors.

As sales of iPod compatible music systems continues to rise from the likes of Bose and Denon, ABI believes Apple has an opportunity to get home-based multi-media products onto the market through tying devices to its successful iTunes service.

ABI believes that the key to this opportunity is

consumers' growing interest in digital media connectivity and a growing interest in products that have the flexibility of portable products like the iPod, but

can deliver a quality sound/picture around the home. There is also a big opportunity for manufacturers to build products that can 'repackage' content already bought from download sites



A/V manufacturers have a big opportunity to exploit the success of the iPod

around the home.

To a certain extent this is already catered for by media centric PCs including Apple's own Mac Mini, but ABI believes there is big potential for hardware in this sector.

# Philips supports HDMI 1.3 with ESD chip

Philips Electronics has announced the introduction of what it describes as the industry's first Electrostatic Discharge (ESD) protection chip to support HDMI 1.3. Philips' integrated solution provides high-level ESD protection, back-drive protection and level shifting and supports the latest HDMI 1.3 specification as well as previous standards such as HDMI 1.2. Philips says the IP4776CZ38 offers ultra-low line capacitance to ensure high signal integrity for video formats such as 1080p.

The maker also says that the higher speed requirements of interfaces such as HDMI 1.3, combined with the trend towards smaller feature sizes, make additional board-level ESD protection essential for semiconductors developed at 90 nanometers and below.

Dr. Dirk Wittorf,

international product marketing manager, Integrated Discretes Product Line, Philips Semiconductors, said: "Ongoing pressure to miniaturise feature sizes has meant that ICs developed



Philips' IP4776CZ38 is compatible with HDMI 1.3



today are optimised for area, performance and leakage power consumption – not for ESD performance. The result is highly sensitive ICs which burn at low clamping voltages, making external board-level ESD protection

an absolute must.

"Philips' new ESD protection chip makes life easier for the designer and reduces total costs by delivering high performance, ultra-low line capacitance and HDMI 1.3 compliance in a single fully integrated package."

Philips says the IP4776CZ38 chip delivers up to 8kV of ESD protection in contact mode for 4 HDMI transmission channels, I2C-bus, consumer electronics control (CEC) and Hot Plug Detect (HPD) lines. The IP4776CZ38 is equipped with back-drive protection and 4 bi-directional 3.3V to 5V level shifters for I2C, CEC and HPD signals. Total line capacitance is only 0.7pF, with excellent capacitance matching of less than 0.05 pF for Transition Minimised Differential Signalling pairs.

# Power to the people

Solar energy products will be available for the first time on the UK high street as Sharp and Currys are to offer a range of solar energy solutions for the home.

Sharp says that technological advances mean that the solar panels are perfectly adapted to the UK climate because, although they do require daylight, they do not need direct sunlight to work.

Andrew Lee, general manager for Solar, Sharp Electronics (UK) Ltd, said:

Solar power has made its debut on the high-street



"This partnership between Sharp and Currys is a major step forward in making renewable energy easily available to the consumer. "Customers will benefit from the convenience of Currys' stores, where they can discuss their options in-store, as well as Sharp's experience and heritage in solar power, meaning quality, reliability and unrivalled service."

There will be a full training and accreditation programme offered to installers that Sharp chooses to work with - this will be called Sharp Solar Installer Accreditation. Anyone interested in the scheme should contact Andrew Lee at Sharp on 020 8734 2000.

# Analog Devices used for HD-DVD player

Analog Devices, specialists in semiconductors for signal processing applications, has announced its SHARC processor has been selected by Toshiba to power the audio signal chain in its HD-DVD players the HD-A1 and the HD-XA1. Analog says the HD-A1 and HD-XA1 use four SHARC processors to deliver multi-channel audio, providing the high-fidelity audio needed to support HD-DVD.

The company says the SHARC processors are able to decode multi-channel streams in a wide array of audio formats. Leveraging the 32-bit floating-point capabilities of the SHARC ADSP-2126x family, the HD-A1 and HD-XA1 are able to support lossy and lossless formats from DTS and Dolby Labs - including Dolby Digital Plus, Dolby TrueHD and DTS-HD (Core decode).

SHARC provides the audio bite for Toshiba's HD-DVD players



The company adds SHARC's processing power is critical for the simultaneous decode of the Dolby Digital Plus streams, which can reach up to 3 Mbps, and the simultaneous conversion to backwards compatible Dolby Digital streams.

## Panasonic unleashes the power of Blu-ray

Panasonic has released the DMP-BD10 Blu-ray Disc player, a machine that the company believes unlocks the true potential of Blu-ray or BD-Video.

The company says that to get the best HD images from a BD-Video disc, a player that renders high-quality progressive images, expresses motion smoothly and draws sharp diagonal lines is needed. The DMP-BD10's P4HD (pixel precision progressive processing for HD) deals with more than 15 billion

pixels per second and applies the optimum processing to every pixel in the video data on the disc.

BD-Video supports a number of formats. The highest-quality format (1920 x 1080 pixels) can be recorded at any of four different frame rates (59.94i, 50i, 23.976p and 24p) and the compression format can be MPEG2, MPEG4 or VC-1. Panasonic says its player detects these instantly and performs progressive conversion when necessary. Motion detection is also key

to high-level performance and the DMP-BD10 provides 16-level motion detection with pixel-based motion adaptation. The P4HD categorises the image motion of each pixel into one of 16 levels, from stationary to super fast. For areas with stationary images, it applies the progressive processing best suited to still images.

When playing a BD-Video or DVD disc, the P4HD also up-converts content recorded in the 480i/p, 720p or 1080i format to 1080p with precise pixel

generation that creates each pixel from 60 surrounding pixels of information.

High quality sound has also been catered for in the shape of a 192kHz/24bit D/A converter for each of the machine's eight channels. Panasonic says the D/A converter uses advanced segment D-A processing, which applies multi-bit processing to establish the audio reference and 1bit processing to render the delicate nuances.

Panasonic says the DMP-BD10 unlocks the power of BD-Video



## Scientists choose site to detect alien TV signals

Scientists are in the final stages of planning a radio telescope so powerful it will be able to search for alien television or radio signals. Dubbed the Square Kilometre



Scientists will begin search for alien TV with a new radio telescope

Array or SKA, the system is fifty times as powerful as any current radio telescope and gets its name because it will have radiation collecting surfaces totalling a square kilometre.

Scientists say the telescope would, for the first time, enable searches for unintentional emissions or 'leakage' at power levels comparable to that of terrestrial TV transmitters.

Any search would have limitations. The instrument

might not be able to decode the transmissions, however, it may be possible to get a general idea that some sort of TV transmission was occurring and build a stronger telescope to read it. Scientists are also not clear how to recognise such signals, even if they are there. However, it is hoped that they would feature organised patterns suggestive of intelligence not attributable to any known celestial sources.

## Plasmas preferred to diamonds

In a recent US study 77% of women questioned said they would prefer a new plasma TV to a diamond necklace.

The survey was commissioned by cable operator Oxygen Network (owned and operated by women) and found that any assumptions made about male and female interest in new technology maybe behind the times.

The study found that on average women owned 6.6 technology devices while

men were only slightly in the lead with 6.9. The study also found that four out of every five women said they felt comfortable using technology with 46% doing their own computer troubleshooting.

The study found that over the next five years women see themselves increasing their activities in six key areas: digital cameras, cell phones, e-mail, camera phones, text messaging and instant messaging.



A US survey finds women would choose a plasma over a diamond necklace

# DABs the way I like it!

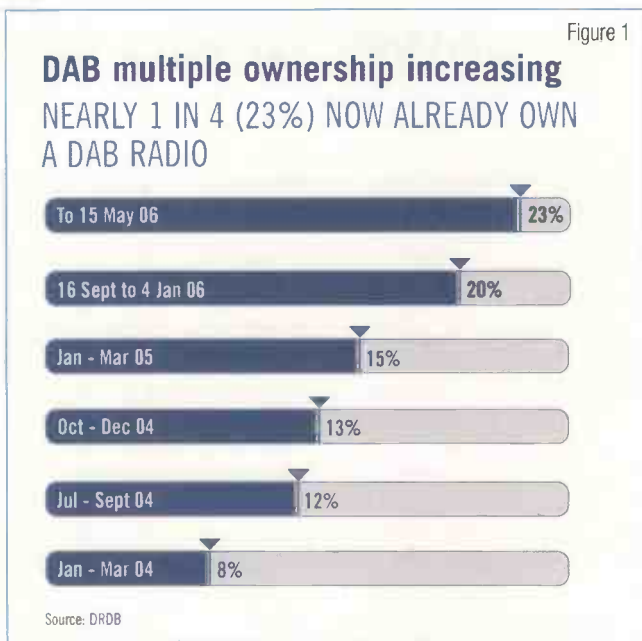
In the concluding part of its study into the digital radio landscape, the DRDB considers the impact of further innovation and looks at the international scene

The relationship between digital radio and the emerging concept of mobile TV is an aspect that is increasing in importance. The DAB family of standards now includes Digital Multimedia Broadcasting (DMB) and Internet Protocol over DAB (DAB-IP), both of which deliver broadcast digital television services alongside audio DAB.

Commercial audio visual broadcast services using DMB have already launched in Korea where more than a million mobile devices have been sold in six months. The UK became the first European country to launch a similar commercial service, this time using DAB-IP, in the summer of 2006. Live mobile TV is set to become a reality as Virgin Mobile and BT Movio bring digital TV and radio services to mobile phones using broadcast technology. Broadcast via the UK's national commercial digital radio multiplex operator Digital One's existing DAB network, the Virgin Mobile service will deliver a reliable, high-quality viewing and listening experience to an infinite number of mobile users. BT Movio/Virgin Mobile are partnered with HTC, TTP and Microsoft for launch device and software development.

## Music Downloads

The DRDB also sees potential for DAB in the music download arena. The radio industry could offer consumers a cheaper and more efficient alternative to 3G for downloading



music over a mobile network using DAB digital radio spectrum to send downloads to phones.

Trials are due to begin in the UK this year using technology developed by UBC Media Group with BT Movio. Digital radio spectrum is designed for broadcasting data streams to a large number of listeners at the same time, making it more efficient for distributing music files than 3G. Radio stations could therefore charge lower prices for downloads than mobile operators.

Digital radio consumers are keeping up with the pace of change and listening habits are changing as people are consuming more media than ever before.

From the Internet to the iPod, from digital TV to digital radio, consumers are offered more choice in more places than ever before. The ability to receive new radio stations has consistently been the number one reason for purchase since

the DRDB began tracking "reasons to buy". More than 1.5 million DAB digital radios were sold in the year ending April 2006. With 30 million adults in the UK already DAB aware, consumers are getting the message and liking what they hear. Nearly one quarter (23%) of DAB owners are repeat purchasers and 13.6% of the UK adult population now has a DAB digital radio at home, that's 6.7 million people. (see Figures 1 & 2)

Delving into the figures even deeper shows a



continuing snowballing of DAB momentum. More than 50% of the UK adult population listens to digital radio services via one platform or another, that's 25.5 million people. This represents an increase of nearly one million in just three months (Rajar Q1, 2006). Of all listening via digital platforms, DAB represents the majority share at 55% (DTV 27%, Internet 16%). When people listen to a DAB digital radio they tune in for 16% longer than average, consuming 27.6 hours of radio a week versus the average of 23.8 hours a week. In terms of age profile 23% of DAB owners are aged 15-24, and 60% are under 44 years of age. The profile is becoming younger as new designs and integrated form factors come to market. The top three reasons for buying a DAB digital radio are to receive new digital stations, achieve better sound quality and improve reception of existing stations. (see Figure 3)

### Broadcasters

Naturally broadcasters are trying to keep pace with an ever increasing demand. With a DAB digital radio listeners can receive around twice as many stations as they can on FM and AM. There are 414 DAB services on air in the UK, of which 55% are only available with a DAB digital radio (with the remainder being analogue simulcasts). More than 30 completely new formats have emerged since the inception of DAB in the UK, including dedicated services for country music, children's radio, ethnic stations, rolling news, comedy and drama channels, sport, dance, rock and chill-out. Later in 2006 the regulator Ofcom will advertise the licence for a new national commercial DAB multiplex, bringing up to ten new national DAB radio stations to the UK. Over the next 18 months to two years, up to 30 new local and regional multiplexes will be advertised by Ofcom, leading to an expansion of the overall DAB network and up to 250 additional services. Some digital radio stations have seen their best ever listening audiences reported this year, with figures up 50% and even 60% year-on-year.

### The International Picture

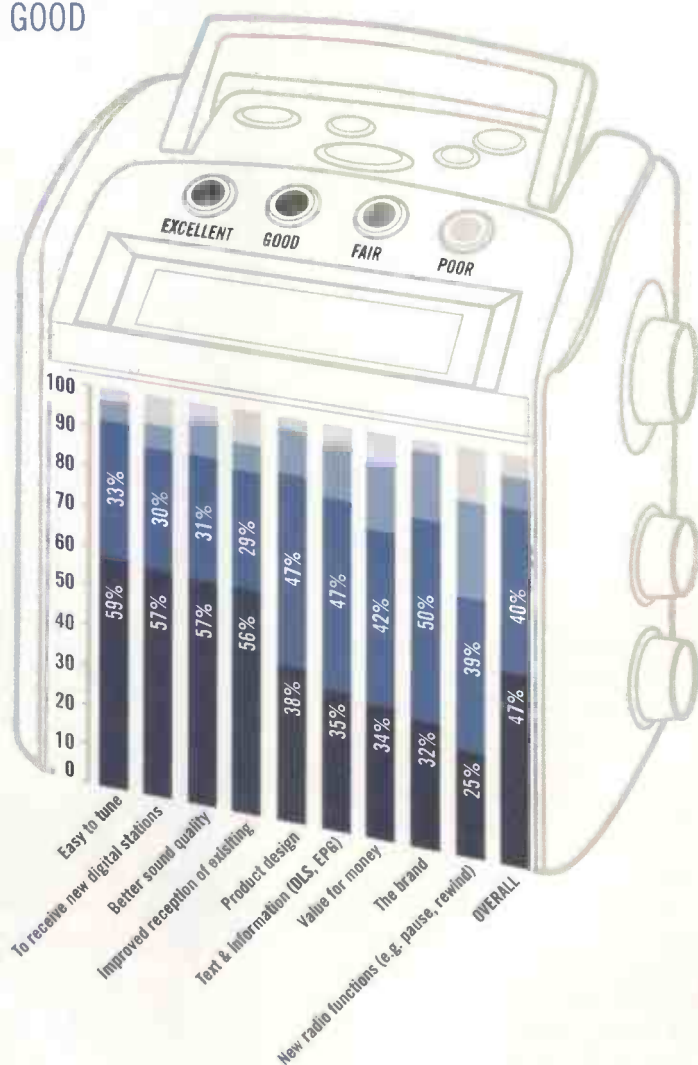
DAB digital radio has become an internationally adopted standard that can be seen and heard in nearly 40 countries from Canada to Australia, across Europe and the Far East. Countries including India, China and South Africa, are testing DAB and developing consumer trials. More than 500 million people worldwide are within range of a DAB digital radio transmitter and there are nearly 1000 services on air. Around the world, DAB sales showed encouraging growth trends in 2005. While the UK continues to lead the charge, other countries are following the pattern established by trade bodies such as the DRDB and WorldDAB, and sales are growing as a result. The following is a snapshot of the status

of DAB in a selection of countries around the world. Korea has the potential to be a massive market for DAB and its family of standards. DMB (Digital Multimedia Broadcasting) services launched commercially in South Korea in December 2005 and by June 2006, more than one million devices had been sold. China is a key market for the DAB, DMB and DAB-IP family of standards. Not only is it the powerhouse of the global supply chain for products, with the largest population in the world, the adoption of DAB in China will have a huge effect on the worldwide development of DAB. Trials are underway in several parts of the country with broadcast licences issued covering Guangdong Province, Beijing and Shanghai, with commercial DMB services due for launch in 2006.

Figure 3

## DAB owners satisfaction

87% OVERALL SATISFACTION  
RATED AS EXCELLENT  
OR GOOD



# 50 YEARS AGO

By Keith Wilson

**W**e've all done it, haven't we? Settled down, I mean, like the guys in our October 1956 cover picture, with a nice cup of tea and a slice of cake to watch the test card for an hour or two! Actually, given the average entertainment value of today's programmes, the test card is often preferable, but surely things weren't that bad in 1956?

The cover picture introduces an article which explains the intricacies of that old favourite, Test Card C. It's a design classic – a simple test pattern that simultaneously provides checks for aspect ratio, resolution, video bandwidth, contrast, scan linearity, sync separation, LF response and uniformity of focus.

From my recollections, one of the checks most desperately needed was linearity. It was common to see sets which displayed circles as very egg-shaped indeed. In fact, it always amazed me how people could live with such badly distorted pictures. Perhaps they thought that all actors and presenters naturally had very tall foreheads!

Another article covers the operation of televisions from batteries 'for country dwellers' and serves as a reminder that many areas of the country at that time had no mains supplies. As a method of producing an HT supply, the circuit diagram of an early switch-mode power supply is shown. Don't get too excited, however, there are no MOSFETs here, just a vibrator.

## Glorified buzzers

For those too young to remember, vibrators were once normal stock items for the service trade. They were, in fact, glorified buzzers with extra contacts to chop the DC supply from the battery so that it could be applied to a transformer. Some types even had another set of contacts to provide synchronous rectification. Pretty clever, huh?

The downside was that these things, which were common in car radios, produced lots of Radio Frequency Interference (RFI). Not exactly what you want next to your television, especially if you lived in a fringe area.

In fact, vibrators were so good at

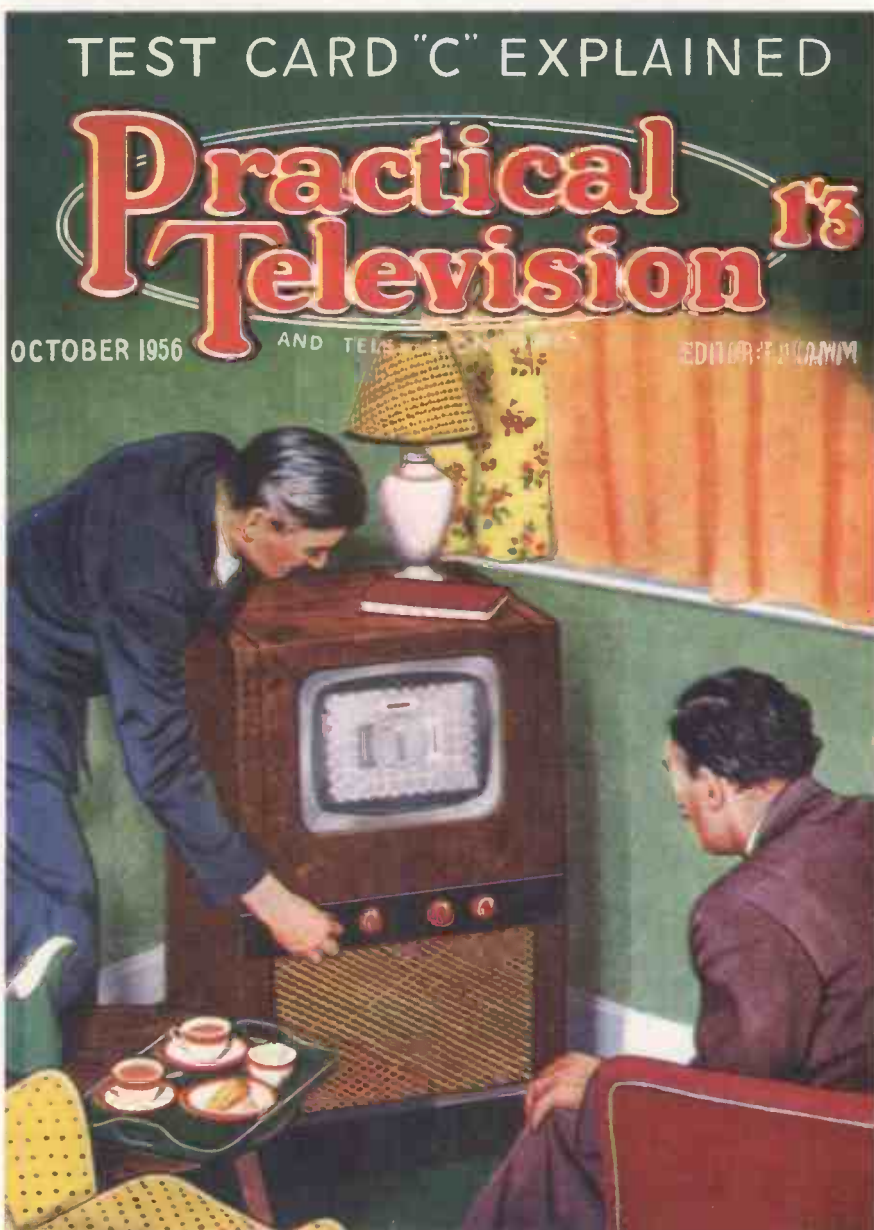
producing RFI that, when I was very young, I used one in conjunction with a long wire aerial as a crude spark transmitter to communicate with a friend who lived close by. No one in the area could watch their television while we were on the air, but at the time that didn't seem important! If anyone reading this lived in Kidderminster in the late 1950s, please accept my belated apologies.

Someone who appears to have made

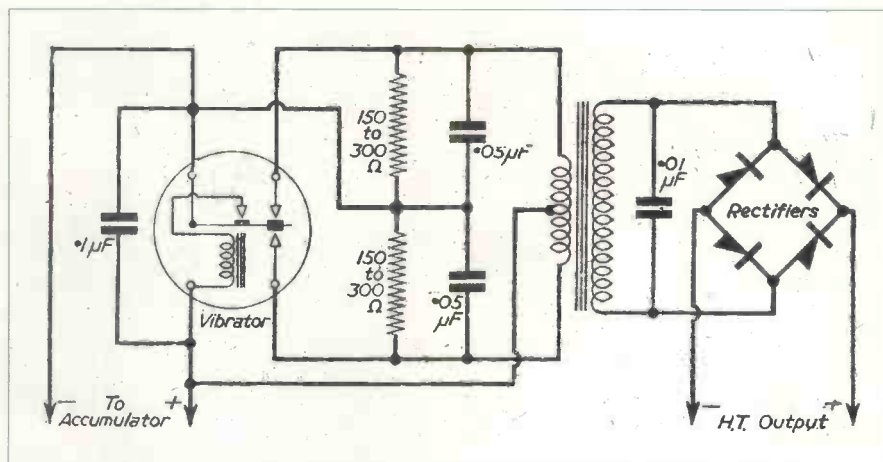
good use of battery-operated television was the then Australian Prime Minister, Gordon Menzies. The news pages report that, during a visit to London for discussions on the Suez crisis, he had a television installed in his car. Obviously he wanted to keep right up to date with the latest Suez developments.

But hang on a minute, this was long before rolling news or even regular daytime TV news bulletins. No, Menzies' car TV, according to the

Tea and the test card – who could ask for more?



A switch-mode supply, 1956 style



report, had a much more important purpose – to allow him to follow Australia’s progress in the test series! Not that it did him much good, as England won.

### Story of the tape

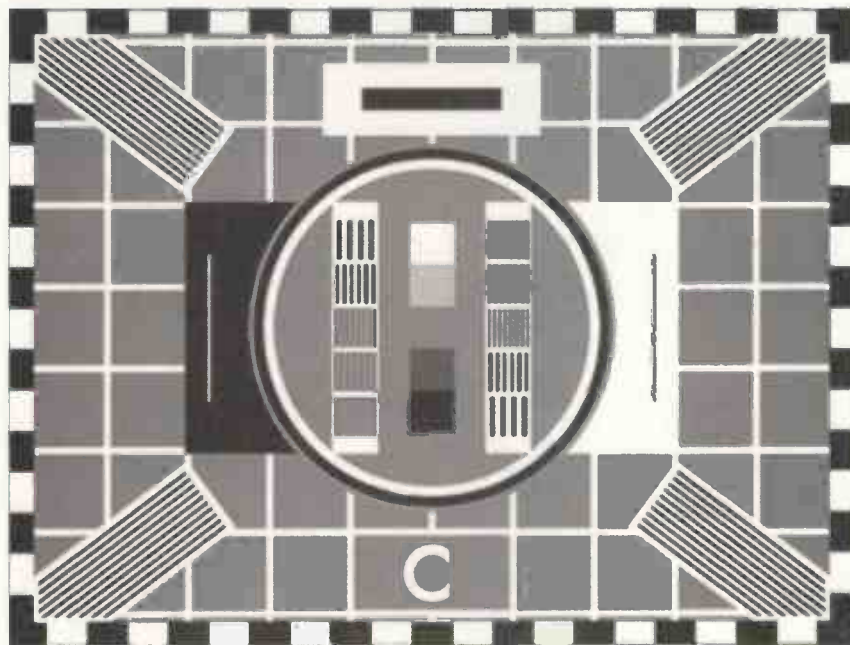
A report that was arguably to have more long-term significance mentions that, in the USA, the Ampex Corporation had managed to record good quality television pictures on

tape moving at just 15” per second. Transverse scanning of the tape was, of course, the key.

In the UK, the BBC was working on VERA (Vision Electronic Recording Apparatus) which used longitudinal

recording and could achieve comparable quality. However, this system had the slight drawback of using a tape speed of around 200”s per second. A 20.5” spool of tape gave a recording time of 15 minutes. It’s not hard to see why the Ampex system won out.

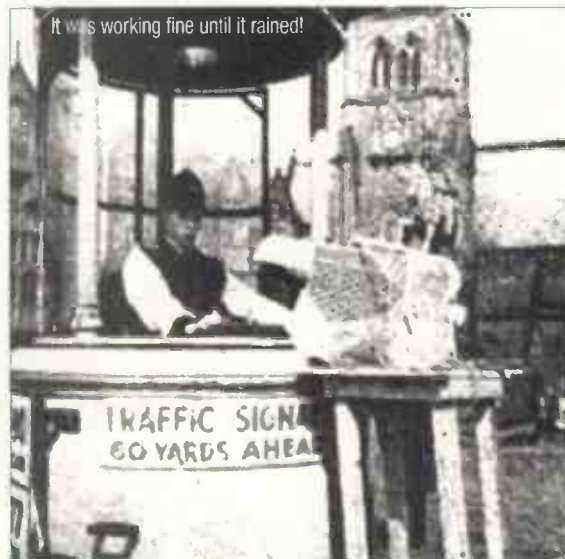
Test Card C, a design classic



Finally, if you thought that CCTV systems that spy on you as you drive around town were a new idea, think again. It is reported that, in August 1956, Durham installed what must be the ancestor of all modern traffic management CCTV systems.

It comprised two cameras, one mounted on a lamppost, the other in a convenient first-floor window. The pictures were relayed to a policeman on point duty who, by directing traffic according to what he saw on the screen, was able to ‘considerably reduce congestion’.

Great idea, but I guess today’s practice of recording the images for later use as evidence of traffic offences would have been a bit inconvenient. Those 20.5-inch tape spools would need changing every quarter of an hour!





In the first of a new series on CCTV, Mike Tennant, director of training at CCTV education specialist TAVCOM, takes a look at the opportunities in this sector



Use of CCTV is expanding across the UK, increasing service and repair opportunities

# Opportunity Knocks!

I wonder how many of you remember the earlier days of television when larger-than-life presenter Hughie Green introduced the hopeful 'would-be' stars of entertainment to the delights of stage, screen and television?

I remember those days clearly - a fact that probably gives you an all too clear indication of the age of your author!

But, there is a serious message behind this quick trip down memory lane for everyone who is currently beavering away in the television service industry.

I would like to suggest that this is also a time of great opportunity for you. Now is the moment for those who have an appetite for change and a hunger for developing their skills to take advantage of new openings offered by the emerging CCTV (Closed Circuit Television) and Internet Protocol (IP) industries. Opportunity is knocking loudly at the door of all of you who are seeking advancement in your professional lives.

## Why CCTV and surveillance?

I came through the ranks of television and video servicing and 'graduated' into

production video and medical before heading off into the security sector. I think the current changes in CCTV offer enormous potential to those with a solid background in TV and consumer electronics to add this dynamic revenue stream to their business. To encourage you all to examine and seize these far reaching opportunities, I will be providing a series of 'distance learning' articles over the next few months.

Good levels of service and repair opportunities exist in the sector because most display screens, recording equipment and cameras were not originally designed for the extremely long hours of operation they are expected to achieve.

I suspect that many a MTBF (Mean Time Between Failure) figure quoted by manufacturers is a little economical with the truth. In fact, I would wager that the figures are based on the average usage of the domestic market in recording and displaying of a few hours a week, not the 24/7 treatment that security equipment is often subjected to. So things do go wrong - indeed you will find it is the normal state of affairs.

## Common problems include:

- Underrated power supplies (that nice fishy smell at the end of a bit of hot wire!)
- Hard drives that have given up the ghost
- Fans that have clogged, equipment that has overheated and fuses that have popped.
- BNC connectors that are badly crimped
- Cable runs that are too long
- Microsoft Windows causing a problem in the registry
- Resetting needed due to unskilled tampering

## CCTV equipment

Many of these are problems that will already be familiar to those with experience in TV and video repair.

I recall providing a training course for a group of Sony broadcast engineers three years ago from the European and Middle East regions. Naturally we could not really teach them anything about the video signal, vertical intervals and basic television techniques. However, what they really enjoyed was the tremendous



diversity of transmission methods, the type of picture information possible and the sheer vastness of the CCTV market.

Because of the size of the market, repair and service skills are definitely required nationwide in the security sector. Systems use CRT, TFT, Plasma and rear projection for display. Setting up with video test signals is naturally essential and importantly not all security and surveillance rated products are in the in the throwaway commodity market. There are a wide variety of Digital Video Recorder's (DVR) with high recording capacities. Typical hard drives are terabyte size to enable up to 16 cameras to be recorded 24 hours a day for a 31 day cycle. This is not to mention the reprogramming necessary when the 'wrong fingers' have tried to reset a system.

PTZ's (Pan, tilt and zoom) units also go wrong and need repair and service. Dome cameras have a limited life, lenses stick, motors perish, leads come apart and camera housings have heaters with resistors that pop or are just underrated for the job.

### Cable ties

CCTV uses 75ohm rated cable just like the television industry. The bandwidth frequency of course is only 5.5MHz which means that we cannot utilise the same stuff used for our domestic television down feeds. However, what is really interesting to note is the wide range of other

transmission methods we deploy every day.

Twisted Pair (these days more CAT 5) where we can run up to 1.5 Kilometres for each camera fed through either an active BALUN (balanced and unbalanced) transformer at each end, or by using the more expensive launch and equalising amplifiers. These need servicing every six months at least.

Many a system is connected with multi-mode and single-mode optical fibre. Great stuff for video, being totally impervious to external electrical interference and of course you won't get those infernal ground loops. However, there are accidents of broken fibre and the breaks need fusing together with the least amount of dB loss.

Then there is free space transmission, microwave signals at 60GHz, 2.4GHz and a range of specially attributed frequencies. These all need setting up and servicing from time to time. Laser (active infra red) has great advantages in installation costs in major cities, no cable laying costs for example. Still, the downside is they need careful setting-up and the brackets need to be not of a material that would expand and contract and cause the transmission to shift by a micron or two.

In this sector your skills also need to include the computer industry with knowledge of the IP range of transmission for LANS, WANS and of course VLANs. The problem here, as we all know, is the limited available bandwidth and the

inherent latency issues. There are also other difficult feats to master like back focusing the installation and following a suspicious person using telemetry (PTZ).

Then there is video management equipment including Matrix switchers, GUI's (Graphic User Interface Screens) VDA (Video Distribution Amplifiers) and Peak White Inverters.

Then of course there are those 'days out in the country' when you can find yourself climbing up towers and poles or having bags of fun in 'cherry pickers' getting up to the cameras.

### Opportunities abound

Ours is a fascinating and growing industry in which there is a definite need for technical skills based on your existing expertise. Whether you are interested in CCTV system design, planning, installation or repair and maintenance, a little bit of effort can enable you to develop your career in any of these sectors.

Tavcom is the UK's leading security systems training company providing 'real world' hands on training for CCTV and other electronic security equipment.

Training is carried out at our purpose built training centre in Hampshire which offers state of the art lecture theatres and workshops for the optimum learning experience. We can also conduct courses at a client's own chosen location both in the UK and across the globe.

Our expert qualified tutors are all experienced engineers with a proven track record in installation, design, operation or project management.

For more details of our company and services take a look at our website at [sales@tavcom.com](mailto:sales@tavcom.com)



A little learning can open-up new opportunities in CCT





# Custom made opportunities

In the first of a new series, Matt Nimmons, operations manager at CEDIA, the Custom Electronic Design & Installation Association, outlines the opportunities available in the custom installation market

**W**e trade in a competitive world. Global markets, internet shopping and supermarket dominance have all had a huge impact on consumer's expectations and shopping habits. This is especially true in the TV and consumer electronics business.

If a specialist TV retailer or service engineer does a 'good' job then they're still not guaranteed that they will make enough of a living to pay the bills and may well, in this competitive world, end up going out of business. 'Excellent' performance may generate enough profit to pay the mortgage, feed the kids and maybe take the odd holiday. But this brings its own problems because it may be necessary to work so hard to achieve "excellent" that there is not even enough time to take a holiday. Supplying boxes or repairs, however good the service might be, can only get independents so far. Competing with high-volume multiple retailers or commodity based product lines can be a dispiriting business. Meanwhile, cable TV and aerial installation companies are also increasingly keen to develop their skill sets to give consumers something extra, sharpen the difference between themselves and their competitors and add value to their own business offering.

The fast-growing world of custom

installation offers real market opportunities and training support for service engineers as well as cable and aerial installers, keen to take advantage of this situation and integrate new technologies into their business strategies.

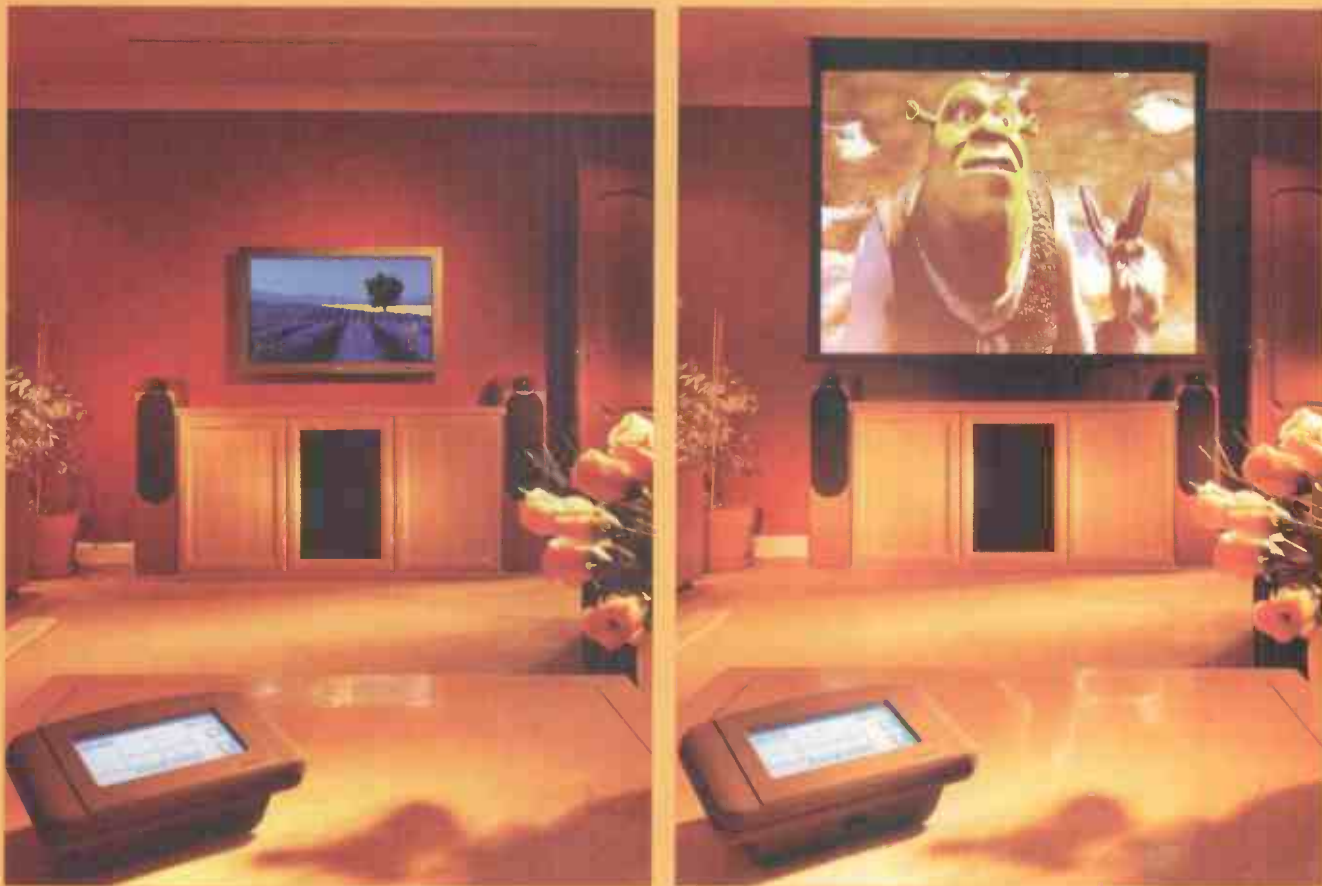
## What's the job?

Custom installers specialise in the planning, design, supply and installation of discrete, automated, electronic systems for the modern, intelligent home. At one end it embraces high-end TV's and home cinemas (the boxes many retailers and installers are incredibly familiar with already) and can extend to the integration of these systems with complete home networks and sub-systems which can intelligently control multi-room audio, lighting, security, HVAC (heating, ventilation & air conditioning), and even garden facilities, from lighting to watering.

Custom installation is, in many ways, a natural business development for many service engineers and cable and aerial installers, especially in the common entry point area of high definition TV, plasmas, LCDs and home cinemas. Most importantly it allows them to differentiate and add real value to a client (a client where the trust relationship may well already be in place), with a first class and

varied range of system supply, design and installation service contracts to match. These contracts have equipment and labour elements which allow businesses to charge for their time. They have extended time frames, often extending over a year, so there'll be an order book with some predictability, which will allow businesses to budget with greater certainty. No more waiting for increasingly erratic through-the-door traffic or reactive telephone calls. Even more beneficially, individual client spend on a typical custom installation project can be considerable (six figure contracts are not unusual), not least because the customer is frequently buying more than one service from a custom installation business.

So what's required to take your business forward into this market place? That's where CEDIA comes in. CEDIA is the international trade organisation for the custom installation sector, spanning three continents and with a global membership of nearly 4,000 companies. CEDIA was founded in 1989 in the United States and came to the UK in 1996. From a standing start, the Association now boasts well over 400 member companies. These range from designers and installers of home electronic systems to equipment distributors and the leading brand manufacturers.



Custom installation can refocus existing skills for the modern market place

### Responding to demand

CEDIA members are responding to increasing demand for their services not just direct from homeowners, but also from interior designers, architects and house builders. As this market growth continues, CEDIA's task is to help members take full advantage of the opportunities by providing them with essential education and marketing support. This will ensure that the high standards of quality, professionalism and credibility which CEDIA membership brings, will be maintained for the benefit of consumers and the building industry professionals they employ.

To this end, CEDIA runs a whole series of courses both at the annual CEDIA Expo, held at ExCeL London in June, and at various regional training sessions throughout the year. A number of these courses are specifically designed to take existing businesses, with an established track record in one environment, and equip them with the tools they need to take on the demanding but ultimately exciting and rewarding area of custom installation.

In September CEDIA ran a specific course for new entrants into the sector, entitled, "Introduction to the UK Custom Installation Business". Presented by Steve

Moore, the founding Chairman of CEDIA in the UK who has been in the industry for over 20 years, the course provided a thorough grounding in all aspects of the integrated home business. The course took place in CEDIA's purpose-built training facility at its UK headquarters in St Neots and featured seven 90-minute modules, with two one-hour workshops. CEDIA will be looking to repeat this course at a later date and details should be sought in the first instance from [www.cedia.co.uk](http://www.cedia.co.uk)

Additional CEDIA courses can help build on the knowledge gained on this course and explore the different requirements of the market in fine detail, providing the opportunity to enrol on the CEDIA Professional Certification programme. These courses cover, for example, cabling infrastructure design and termination, TCP/IP and networking, an introduction to audio systems and calibration and an introduction to control systems. Other CEDIA courses include how to communicate with wealthy clients, how to document your jobs, how to behave on a building site with all the essential health and safety requirements, and many, many more.

The CEDIA Professional Certification programme delivers a range of benefits

to individuals, consumers and manufacturers, by establishing clear, objective standards for the required skills and knowledge of electronics system designers and installers. Through CEDIA certification, designers and installers will be recognised as the most qualified contractors to perform the design and installation of home electronic systems. Through CEDIA's training programs, designers and installers can obtain continuing education in both technical and business skills to enhance the growth of their employees and their business.

CEDIA-certified professionals must take a minimum number of continuing education units (CEU's) to maintain their certification through regular training over a three year period, ensuring the highest degree of professionalism and competency. As a result, certified designers and installers will always possess the most up-to-date knowledge and stay current in their skills and expertise. So, if you are already keen to move your business forward, get excited, get equipped and step up to the new opportunities of custom installation, visit [www.cedia.co.uk](http://www.cedia.co.uk) or call +44 (0) 1480 213744 to learn more on the courses available.



# Letters

## The return of Mr Angry

I'm going to have a good day today I thought as I swung the van into the industrial estate. However, the alarm on our building was making the most terrible sound. I checked for broken windows but fortunately there were none. With the alarm practically bursting my eardrums, I managed to prise out the bolts from the shutter door and raced to the control panel to stop the noise. The alarm went quiet but the ringing in my ears carried on for some time.

This didn't dampen the unusually good mood that I was in, so I settled down to make myself a nice cup of tea before starting the day's work. I filled the kettle and switched it on, there was a loud explosion and the top of the kettle plug blew off and landed black and smouldering next to my feet. No worries though, it was an old kettle and I used the microwave to boil the water for my tea.

Enter the first customer of the day. As I've said before my memory for faces is poor, but I was sure I had seen him before. When he started to speak I instantly recognised him as

Mr Angry, the subject of a previous letter and if you remember he vowed never to enter my shop again.

"This remote thing that I purchased from you has failed again," he complained. It was not the same handset he had presented me with earlier in the year. This one looked almost new and had COM3186 stamped onto it. A little investigation told me this was a Toshiba replacement and as luck would have it we had a reconditioned Toshiba on display. Pointing the handset at the TV, I pressed the volume button and up came the sound, so I changed a few channels and it all seemed to work. "Looks OK to me," I said. Mr Angry's face went bright red.

"Don't try to smooth talk your way out of this one as well," he screamed, "It doesn't work my TV and I want a refund."

Another customer walked through the door as Mr Angry was in full flow about how I had refused to exchange his last handset and how he wasn't going to let me get away with it. As there was a customer waiting to be served, I gave in and asked him for

his receipt which he promptly slammed down on the front desk.

I studied the receipt but it was not one of mine. "This receipt sir is not from here," I said. I thought he was going to burst, the veins were sticking out of his neck and his fists were clenched. "Just give me my money back," he screamed. The other customer left the shop. This was my cue to stand up to this character. "No I can't give you any money back because I didn't take any money in the first place, your receipt is from the shop down the road." There was a brief silence. I could read in his face that he realised his mistake, would he apologise I wondered. The silence continued for what seemed like an age. "Well why don't you take it down there," he snapped.

"Sir you're just being unreasonable now and I would like you to leave," I said, picking up his receipt and handing it to him.

"Don't worry," he said, "I'm going and don't expect to see me again any time soon." I do hope he means it this time.

Well by now my mood had darkened somewhat, I sat at my workbench to tackle my first set for the day an Hitachi C28WF460N. A nice easy one I thought as it had a partial frame collapse. As I was measuring supply voltage someone shouted shop!. It made me jump and the meter probe slipped. I saw sparks across adjacent pins of the frame IC then the TV switched itself into standby. Now I was really fed up. I went to see what the loud voiced character wanted.

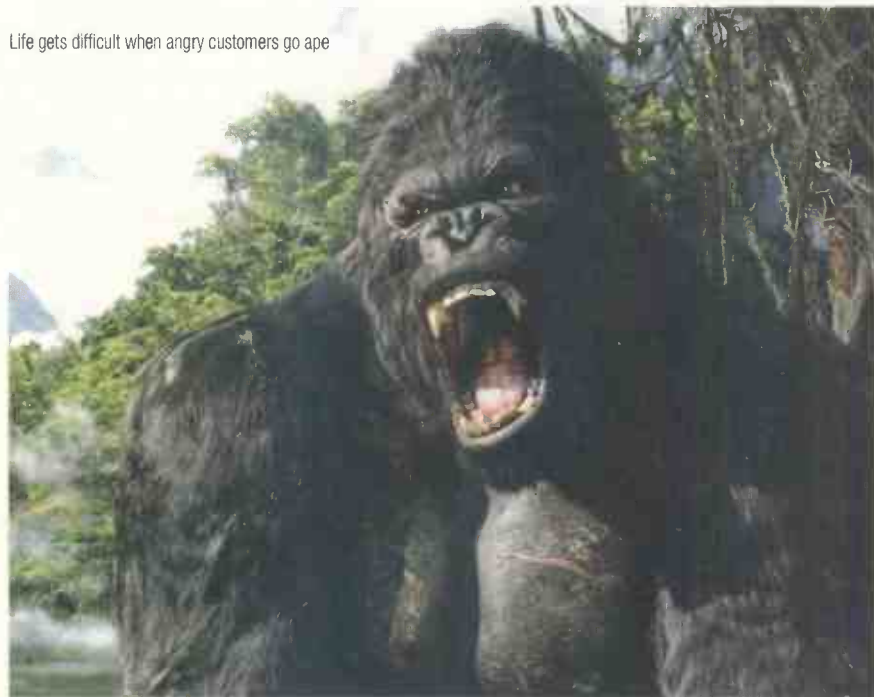
"I wants me fuse box moving mate, we can't get our ironing board in the cupboard where you've stuck it and we needs it sticking somewhere else."

Great someone else who was in the wrong shop. I said: "You need the offices next door sir we don't do electrical installs."

"Well you lot put it in," he sang back.

"No we didn't it's the company

Life gets difficult when angry customers go ape



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

Email: TVeditor@nexusmedia.com, using subject heading 'Television letters'

next door you need."

"So your not gonna move it for me then?"

"I can't I'm not an electrician but the company next door are so please go there."

"Well you fixes tellys don't you, what's the difference?"

Eventually he did leave and I watched him go next door.

I'd had enough, I'd earned no money, made a few enemies and was hot and fed up. I'll finish the Hitachi tomorrow I thought, so I set the alarm and locked up. I joined the rush hour traffic and set off for home. I was just about to pull out onto the A420 when there was an extremely loud bang from under my bonnet followed by the sound of grinding metal. Then nothing, just the sound of horns behind me. I waited an hour in the heat for the RAC who said my cam belt had snapped and I was looking at a very expensive repair. Why does everything go wrong at once I wonder?

A.D Lyon Visiontech

### A final word

Would you permit one final (I hope) rejoinder to our friend Geoff Darby. (Letters August 06)

When I glanced through your latest effusion, Geoff, I have to admit that my first reaction was that it was better out than in. I don't mind if you wish to call me a grumpy old man – sticks and stones, etc – although with great respect, it appears to me that it is you who is doing most of the grumbling, not I. And what an adventurous life you lead with exploding fuses to add to erupting condensers! It makes my peaceful workshop seem positively mundane by comparison. Seriously, though, Geoff, you do seem to be permitting yourself to stray considerably from the point that my reference to variacs, which you appear to find so provocative, was in connexion with vintage radio receivers and not with arcane and exotic modern pieces of equipment which, poor dears, appear

to have to be treated with kid gloves. And do, do, try to retain a sense of humour and not let yourself be wound up so.

My very best wishes to you, Geoff. I have enjoyed our little fencing match no end and I wish you every success as you wend your explosive way through life.

Chas E Miller

### Alexandra Palace

(Ed. Keith Holder, general manager of Alexandra Palace, responds to the August article on the future of Alexandra Palace).

John Thompson's article on the impact of Alexandra Palace's redevelopment plans on the building's broadcast heritage, contained a number of inaccuracies that gave a skewed account of the Alexandra Palace Charitable Trust's motives and actions.

The aim of the redevelopment project has been to secure the future of the Palace for future generations, to remove ongoing financial risk from the London Borough of Haringey and to bring the half of the building that is currently derelict back into use.

Respecting the broadcast heritage of the Palace has been a priority for the Trustees from the start and a pan-industry group including the BBC remains actively involved. Indeed, the draft lease as it stands includes specific clauses about developing the former studio space.

For reasons of commercial confidentiality, the lease negotiations between the Trust and the preferred investment partner, Firoka (Heythrop Park) Ltd. have been conducted in private. As a result, speculation about the content of the draft lease has no basis in fact.

Keith Holder

### Cobalt blues

I bought a Cobolt DVD recorder Model C17P0093 last year. I cannot use it as it won't set-up. I connect it to the power and the clock lights up, I press the power button and it powers

up. Hello appears on the display and the Cobolt logo appears on the TV screen. However, the set-up button does not work and no other functions work and it will not power-off from the power button. I did not get a user manual with it. Is there a special code I have to use? I would like to obtain a user manual and a circuit diagram for the infernal machine. The remote seems to work OK.

Les Hanran

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(Ed. Can anyone help Les on this one?)

### Telstar

(Ed. We had quite a bit of feedback on the Telstar article from August issue, here are a couple of examples. We are trying to find out a little more about the fate of Telstar, maybe some readers have some info?)

### Telstar 1

I was very disappointed with your article 'Whatever happened to Telstar?' in that it failed to answer your own question.

The front of the magazine sported a prominent picture of Telstar 1 which led me to believe you would be basing your article on this important satellite's history.

Your article, however, only went as far as reminding us (and possibly informing your younger readers) of the significance and achievements of Telstar 1.

From the title of the article I was hoping to be informed of its entire lifetime. Answers to how long the satellite remained in service and its eventual fate.

Is it still in orbit or was its orbit allowed to decay and Telstar 1 ended its life burnt up in the atmosphere? Alternatively was it pushed out into a graveyard orbit or some other fate?

Telstar 1 is the star and to just end your article by telling us that there are still subsequent Telstar satellites in orbit is not the information the title

# Letters

and front of your magazine led me (and probably many others) to expect.

Telstar 1 deserves better!  
Mr. I. M. Williams,  
Sutton Coldfield

## Telstar too

First of all may I take this opportunity to thank *Television* for all the quality information I have learned in the thirty one years I have purchased the publication.

I am totally self-taught and was in the trade in the late seventies and early eighties. Then I left to join the then Post Office Engineering Department. Recently however there have been some articles that were not of such high quality. The recent debate on electrolytic capacitors is one such example. I nearly lost an eye when an electrolytic in a Bush TV161 exploded over my shoulder. It was so violent that its innards totally left the can taking all the terminated wires with it. It ended up stuck to the workshop wall some twelve feet away and the bang caused injury to my right ear. Ever since then I don't trust electrolytics with a bulged end. Modern electrolytics are made in a totally different way and don't seem to deteriorate in storage.

But it was an article in August 2006 issue that has made me put fingers to keyboard. I don't expect poorly researched information to issue from the pages of such a well respected publication as *Television*.

I refer to the article 'Whatever happened to Telstar'. On the third paragraph we are informed that: 'Before Telstar, transatlantic communication was achievable only over telephone cables linking France and the United States'.

What is it about us British that makes us so ignorant about our technical past?

The first transatlantic telephone cable was between Oban in Scotland and Newfoundland Canada. From there it was routed to New York. The system was designed by the British Post Office and AT&T and was laid in 1956. The system was known as TAT

1 and remained in service until November 1978. It is interesting to note however, it was not taken out of service because of a fault, rather its 36 channel capacity rendered it uneconomic to keep in service.

If readers are interested in this technical achievement more information can be found in the special edition of the Institution of Post Office Electrical Engineers journal 1956.

Philip Jones

## Shocking design

I share Martin McCluskey's concern about electric shock from the metal casing and I/O connectors of unearthed VCR/DVD/TV equipment (*Television Letters*, August 2006). I believe the most common cause of this phenomenon is the presence of EMC filtering components between mains input and the equipment earth.

I had a particularly notable experience with a Panasonic DVD recorder of sparks when connecting leads, and a 'tingling' sensation as well as illumination of a neon voltage tester when touching the case. This prompted me to report this to Panasonic customer support.

The response explained that: 'The circuit has direct connection between live parts and parts safe to touch'.

'The components are specially designed and tested to meet recognised safety requirements and only permit extremely low levels of current flow'.

'We always recommend connecting equipment whilst mains supplies are disconnected'.

'This especially applies to aerial connections where several equipments could be connected to the aerial'.

Whilst the instruction to disconnect all mains supplies to all equipments when making connections is indeed given in the operating manual, I doubt if the average consumer adopts this procedure.

Panasonic advised that its equipment conforms with class II

standards, and also stated (perhaps rashly) that: 'Earthing domestic products is not an industry-supported view'.

As an example, I examined the mains input circuitry of a Panasonic VCR (NV-HD100B/EB) in the service manual. The UK model has a serial dual inductor and single capacitor EMC filter between each AC input and earth. However, the European (SECAM, VHF/UHF) model has three capacitors in series with no inductors. Thus the UK model has a single capacitor (C1106 2.2nF) isolating it's case from AC mains.

This VCR carries the double isolation standard logo. I always understood that the double insulation standard requires two separate barriers between dangerous voltages and the equipment user. But in this example a single component failure would present mains voltage to the metal case. The European circuit version with three capacitors in series, appears to have less risk by tolerating double component failure.

An earth connection via the AC power lead prevents case voltage effects resulting from mains input filtering, regardless of other equipments being interconnected, and also provides a high degree of protection from internal electrical/mechanical failure which could otherwise result in parts accessible to touch becoming 'live'.  
John Westmoreland, C.Eng MIEE

## More shocks

Re - Electrical Safety issue mentioned by Martin McClusky about electrical leakage from double insulated appliances.

This is an ever increasing issue. I too agree that it's puzzling that in an age of CE marking and rigorous safety specifications, filter capacitors within DVD players, TV's, and VCRs provide enough leakage to make the appliance perceptibly live to the touch, especially when appliances are used together. Single units can also give shocks if, for example, one leans against a nearby radiator whilst

# Letters

plugging in the TV aerial.

I too have noticed sparks when connecting aerial leads to live TV's. There have also been reports of shocks received when using Karaoke machines with hand-held metal microphones plugged into the offending TV's. I'm surprised the matter hasn't been raised before in the trade press!

A while back we had an enquiry from a local prison where contractors had installed an aerial distribution system and portable TV's in each cell. Prisoners had reported receiving shocks from the TVs when plugging their Playstations into the SCART sockets.

The prison's maintenance department had found that the cumulative leakage from several score of TVs connected via a single aerial system was enough to cause the problem. We advised earthing the aerial outlet plates in each cell and this cured the problem.

As we are involved in pub and nightclub electronic entertainment systems, we always provide an earth path for double insulated CD players, Karaoke machines and plasma screens. By design, many of these have switch-mode power supplies with the filters and we think it's best to be safe than sorry. Normally it's done at the mixing desk which provides the closest 'star point' for these appliances without causing earth hum loops, especially important to avoid in audio/video installations.

It's a shame we have to think about this type of thing, I thought that class-2 was meant to be the safest option?  
Kevin Edwards,  
Leisure Electronics, Staffs

## Re-Ecko small table set

*Television* August 06

Back during my apprenticeship in Edinburgh 1952 to 1957, a colleague and former school friend, narrowly missed serious injury when an electrolytic capacitor exploded during bench testing of a prototype numerical control system for milling machines.

For several years the splattered remains on the factory ceiling, some

20 to 25 feet above the bench, were pointed out as a salutary warning of the dangers stemming from such events.

Some years later as a RADAR instructor at No 1 Radio School, RAF Locking, helping to teach fault finding techniques, I received a new electrolytic capacitor reforming unit. Reputedly the second purchased by the RAF. This was in the early months of 1961 and it was made by Pye of Cambridge - if my memory serves me correctly.

It was one of the very few brand new units issued to the section, as we used mainly faulty RAF equipment, plus specially-made radio and TADAR chassis in which we planted faults. Two of our support fitters became experts at producing the 'faulty' components, eg capacitors with their internals replaced by high-value resistors, resistors with changed colour-coding etc. The test gear was mainly Avo 7's and Select-Tests (vide *Television* April 2005).

To demonstrate the use of the reforming unit, I was authorised to appeal to the camp population for suitable civilian radios. A major source was car radios probably due to the heat from the valves in a very confined space.

I recollect one radio where ten out of eleven capacitors were successfully revived.

In the article on page 608, 'Peak Atlas Enhance digital ESR meter', (*Television* August 2006) there is no mention of the inductance encountered in the generally, helically wound foils structure, particularly of higher-value electrolytic capacitors.

The internal resistance and inductance being effectively proportional to the path length from the respective connecting tabs. There was also no mention that generally the

forming process is similar to anodising aluminium, anodised skin being virtually an insulator when properly formed.

It is this inductance in conjunction with the capacitance, that effectively form the cut-off filter implied by the phrase "to go completely open circuit at 15kHz".

One of my apprenticeship experiences was producing the combined transformer and capacitors for a 400cps power supply for aircraft use. I first made the transformer, which was impregnated and encapsulated in Araldite, which had previously been "thinned" using MEK (Methyl-Ethyl-Ketone) - an impressive, highly exothermic reaction in itself.

When the transformer was finished, I then made-up the foil sandwich for the capacitor - thin copper sheet, kraft paper, thin copper sheet and kraft paper. This sandwich was wound tightly round the transformer. It was protected by a layer of elephant paper, also used as the basic winding core of the transformer. This complete assembly was again impregnated and encapsulated.

Appropriate C-cores, clamps and terminations were added, including a small tag board using Harwin Turret Terminals. Rectifiers were mounted on the tag board, producing the full PSU.

And then we had the problem of testing it!  
Alex Dow,  
Cowdenbeath, Fife



One reader gained experience of electrolytic capacitors whilst in the RAF

# Digital update



get set for digital

**The switch to digital TV is the most significant change in broadcast technology since the dawn of the age of television. The move will present big challenges as well as opportunities. Television tunes into the latest developments**

**B**roadcasting Minister, Shaun Woodward and Industry Minister, Margaret Hodge recently wrote to MPs to lay-out the latest roll-out plans in the switch to a digital UK.

The latest details revealed that Whitehaven in Cumbria will lead the transition as its analogue signal will disappear in autumn of 2007, closely followed by the rest of the boarder region. In the fourth quarter of 2008, the Selkirk transmitter and its dependent relays (which serve the eastern part of the Scottish borders) will switch and in the second quarter of 2009, the conversion of the Caldbeck transmitter and its dependent relays (which serve Cumbria, Dumfries and Galloway) will be completed. Details on the transmitter timetable for the West Country, Wales and Granada, will follow later in the year.

Speaking about the impending switch, Ford Ennals, chief executive of Digital UK (independent body set-up to lead the digital switch) said: "Today's announcement puts Whitehaven at the forefront of the most exciting change to television for a generation. Switchover will significantly add to the choice of channels available and give people options in how to go digital.

"Digital UK's job is to make sure everyone knows how to prepare for the change and that no-one is left behind. In the coming months, we will be working closely with many different organisations in Whitehaven to ensure everyone is prepared for switchover and the benefits it will bring."

## Timetable for switchover

The start date for the rest of the process in each TV region is expected to follow the timetable set out by Tessa Jowell, the Secretary of State for the Department of Culture Media and Sport. (see map)

Switchover date	TV region
Starting in 2008	Border
Starting in 2009	West Country, Wales and Granada
Starting in 2010	West, Grampian, Scottish
Starting in 2011	Central, Yorkshire, Anglia
Starting in 2012	Meridian, London, Tyne Tees, Ulster

The Government says that switchover will be a transmitter-by-transmitter process and that the planning needed to enable

a release of information on when each main transmitter and its relays will switch is continuing. Further details of this process will be released as and when the proper planning studies have been completed.

## Appetite for information

Since the government committed to digital switchover in September of 2005, appetite has steadily grown for details of the programme so engineers, manufacturers and broadcasters alike could plan their strategies. The government states that since that time consumer awareness has steadily increased with over 72% of UK homes now having converted at least one TV set to digital – the highest level in the world.

The recent ministers' letter to MPs also pointed to research published by Digital UK that found while nationally 66% of people are aware of switchover, in the Border TV region (the first to switch) awareness has reached an encouraging 82%.

Ministers argued that the encouraging figures could be put down to the awareness campaigns carried out by Digital UK since May of 2006.

However, Digital UK is not only responsible for providing advice and information for consumers to help them to switch to digital TV. The body also has a mandate to work with retailers and aerial installers to support them in providing a good service for consumers and in delivering the Targeted Help Scheme.

## Targeted Help Scheme

This scheme is designed to back-up the Government's determination to prevent any 'digital divide'. The initiative is designed to provide the necessary help to those most in need of assistance in switching. The Government says a recently completed trial in Bolton clearly showed that older and disabled people embraced digital television if they had the appropriate help and advice.

Those qualifying for extra help will be:

- All households with one person aged 75 or over
- All households with one person with a significant disability (receiving attendance allowance or disability living allowance)



■ All households where one person is registered blind or partially sighted.

Help will also be available free of charge to the poorest eligible households (e.g. those receiving pension credit, income support or jobseekers allowance). All other households will pay a modest fee.

Assistance will consist of equipment designed for the needs of older and disabled users and will also offer participants an installation visit, replacement aerial if necessary as well as follow-up support and specific assistance for blind or partially sighted viewers.

### Getting qualified

Back in March the Government launched a scheme to establish a gold standard for installers and advisors to help deliver its Targeted Help Scheme as well as help in the general switchover process. Under the Registered Digital Installer Scheme (RDI), engineers will be awarded the 'digital tick' certification mark if they obtain a Level 2 National Vocational Qualification (NVQ) in Electrical and Electronic Servicing, undertake criminal records disclosure and have public liability insurance. Speaking at the time of the launch Alun Michael MP and Minister for Industry and the Regions said: "This qualification will ensure that registered installers (of aerials) carrying out the work have the right skills needed to ensure that switchover will be done well and on time. It will also raise standards and improve the overall

## Digital switchover

By ITV region starts:

- 2008 Border
- 2009 Westcountry, Wales (previously HTV Wales), Granada
- 2010 West (previously HTV West), Grampian, Scottish
- 2011 Central, Yorkshire, Anglia
- 2012 Meridian, London (previously Carlton/LWT), Tyne Tees, Ulster



perception of an industry that, at times, has suffered from a poor image."

Also at the time of launch, Ford Ennals, of Digital UK, added: "We intend to maximize 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. This pioneering scheme will confer a new level of credibility on the aerial installation industry."

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 the Science, Engineering, Manufacturing Technologies Alliance (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."

However, the RDI qualification is not just designed to deliver on the digital switch strategy, it is also hoped that the body will form a lasting legacy of high

standards benefiting the industry long after analogue switch-off is complete. In the longer term, apprenticeships will be available to attract high quality people into the sector.

So it would seem that there are going to be major opportunities for this sector, and with the knock-on business that installing aerials can generate by getting through the front door, the RDI scheme may well be worth a serious look. Further details are available at [www.rdi-lb.tv](http://www.rdi-lb.tv) or on 01246 252 857.



Digital UK's promotional campaigns have tried to raise awareness of the UK switchover

# Getting on track

**Digital UK has worked with Ofcom to produce a Switchover Tracking Survey to keep abreast of awareness levels amongst consumers on the digital switchover. The initiative has just published the first in a series of quarterly summaries with some encouraging results**



The digital awareness campaign is getting inside the heads of UK consumers

There has been a flurry of promotional activity surrounding digital switchover



The first in the new regular quarterly reviews from the Switchover Tracking Survey revealed that two-thirds of the population are aware of the UK's switchover to digital television. No massive surprise there, but more significantly the report said older viewers were the most aware of any age group.

In the three months to June of this year, 66% of those surveyed had heard about the switchover process. But across the UK as a whole, awareness was highest among those aged 65-74, at 78% and actually lowest among the 16-24 age group, at 47%.

Of the 66% that were aware of the switchover, awareness was highest in the Border TV region, where switchover begins in 2008, with 82% of people aware of the change.

The national survey of more than 2,500 adults also echoed the Government's assertion that recent awareness campaigns were working. The report noted a marked increase in public awareness following the campaign, increasing by 13% points nationally and by 11% in the Border region. West Country and Wales, the TV regions that will follow Border in the switchover sequence, also have above average awareness of switchover. In the West Country 77% of people are aware and in Wales the figure is 71%.

Publication of the findings coincides with the announcement of the national switchover flagship project in Whitehaven, Cumbria. Switchover in Whitehaven will now take place ahead of schedule in 2007, increasing the number of channels available through a normal aerial from four to 18.

Ford Ennals, Chief Executive of Digital UK said: "These results are encouraging and demonstrate that the message

about switchover is getting through, particularly to older viewers.

"We still have a lot of work to do in order to ensure everyone knows about switchover and understands what they need to do to prepare. This includes knowing that all televisions need to be able to receive a digital signal. Nevertheless, this is a good start to our programme of communication and support, and we will continue to build on it in the coming months and years."

Jim Egan, Ofcom strategy director, said: "The switchover tracker research will provide valuable intelligence on consumer attitudes and expectations in the run up to full digital switchover. It will also be an important means of monitoring progress in the critical years ahead." The Digital UK campaign featured national and regional advertising backed up with information leaflets sent to three million homes in the first three television regions to switch (Border, West Country and Wales). It prompted 20,000 calls to the Digital UK information line and 130,000 visitors to its website, [www.digitaluk.co.uk](http://www.digitaluk.co.uk). The next phase of Digital UK's campaign is due to begin in the autumn with national and regional communications. This will include, for the first time, a big push in the Granada area which is the fourth area in line to be switched some time in 2009.

Television will be regularly revisiting the figures generated by the Switchover Tracking Survey in an effort to keep readers up-to date on the latest regional promotional campaigns, and to assist in judging when demand for installation and advice is likely to peak in the different regions.

# The shape of things to come



Ofcom says that in the digital age the provision of news needs to be monitored. Picture supplied by Jeff Overs, BBC

**The switch to digital has many implications for the shape of broadcast content and its providers. Ofcom is keen to highlight areas that need to be planned for as the country moves towards digital with particular emphasis on the future of Public Service Broadcasting (PSB)**

The first area that Ofcom has come up with proposals for is the issue of spectrum charging. The organisation has published proposals to introduce pricing for spectrum used for digital terrestrial radio and digital terrestrial television from 2012 and 2014 respectively.

Known as Administered Incentive Pricing (AIP), the proposals will bring radio and television spectrum users into line with other spectrum users who are already charged AIP.

The proposals back-up the government's position that AIP should be extended, but that digital television broadcasters should not have to pay until some time between 2010 and 2014, the end of their initial license periods.

However, to simplify matters, Ofcom wants AIP to become liable on the same date for all licensees, from 2014 for digital television multiplexes and 2012 for digital radio multiplexes.

Of the broader issues that Ofcom wants to draw attention to, there is particular emphasis on the way PSB is funded. One of the main contentions from Ofcom is that the BBC will not and should not be the only provider of PSB in a digital world. Therefore Ofcom believes that some careful thought is necessary to assess the need for public money for the provision of PSB outside the BBC.

To deal with specific issues of concern Ofcom has published its work programme for 2006/7. In general this programme is designed to help sustain PSB through the transition to a fully digital

world, but is also to help in preparations for the Government's review of funding for PSB, which will take place before digital switchover is completed.

Three specific issues are of concern to Ofcom. The need for a financial review of Channel 4; the future provision of news in the digital world and the introduction of a new concept called a public service publisher (PSP).

## The work ahead

Ofcom says that for nearly 25 years Channel 4 has played a key role in providing plurality in the public service broadcasting system with its remit to provide a broad range of high quality and diverse programming with a particular focus on innovation, distinctiveness and cultural diversity. Ofcom argues that over the next five years television audience fragmentation and the shift to new media will test how far Channel 4, commercially funded but publicly owned, can sustain its public service remit. Ofcom's financial review will examine in depth Channel 4's financial and operational performance and efficiencies and how Channel 4's contribution to PSB will evolve.

Ofcom identified news as the most valued programme genre on television. The body says that although all PSB providers are obliged to carry news as part of their services, the ability to enforce these obligations will become more uncertain as the privileged value of licence and spectrum scarcity erodes for the commercial PSBs. Ofcom also believes that changes to the commercial environment for non-PSB news providers may also have implications for the provision of news, including regional news. Ofcom appears to believe that news coverage may develop an increasingly metropolitan bias as advertising pressures encourage broadcasters to concentrate their coverage towards these areas.

Ofcom has also asked whether there is a case for institutional innovation in public service broadcasting beyond the BBC and Channel 4, with a new media focus.

This concept of a PSP would see the setting up of the first provider of public service content rooted in the ideas, creativity and ethos of new media (on-line and video-on-demand for example). Ofcom will work at developing more detailed proposals on the PSP's creative remit and how it would work in practice.

Ofcom says the future of Channel 4 needs careful consideration





Above: LG has developed a new version of the XD Engine for its top line sets

Below: The PY2R is the pinnacle of LG's Plasma production line

# LG innov





In recent years LG has not only built its market share but has also worked hard to build a reputation as an innovator of new technologies. *Television* talked to James Atkins, overall marketing manager for LG UK, about its key products and plans for the future

LG recently unveiled its key product lines for 2006 including several eye catching new Plasma and LCD TV models.

James Atkins of LG says: "We are in a very fortunate position in that we are one of the very few companies who manufacture both LCD and Plasma screens. This gives us the ability to manoeuvre within the market to take advantage of where consumer trends drive development.

"We have seen LCD sizes creep up into areas where, traditionally at least, Plasma has been dominant. But in turn Plasma sizes have gone up and those over 50" have started to sell very well.

"We have tried to shift to accommodate a more high-end customer. We are still a mass market company but we do want to cater for the 'step-up' customer.

"However, this does not just mean larger screen sizes but more importantly extra features. For instance the new PY2 Plasma's both have two SD card slots which can read nine different card types and many of our TVs include two digital interfaces for HDMI and DVi."

LG is also proud of its recently updated screen driver called XD Engine.

LG says the chip takes low or standard resolution signals to near high-definition levels by improving brightness, contrast, detail, enhancing colour and reducing signal noise.

#### **XD Engine explained**

XD engine has a whole range of features that are designed to take on different challenges within the picture reproduction process. Pure Palet acts in a similar way to the equalizer of an audio system, automatically controlling images to re-produce natural skin tones and colours.

CrystalVue's job is to improve picture quality by a new three stage process. Firstly a noise reduction stage: XD Engine 2005 was limited to noise reduction within only the current frame. However, the 2006 version is able to apply a 3-step control mechanism by data analysis of the current, previous and next frame which allows for an improved flow of images. There is then a HD scaling stage and finally a stage which improves quality by emphasising edges and shapes.

XD Engine also includes ContrastPRO which analyses the input signal and optimises the contrast by making dark areas darker and bright areas brighter. The XD Engine controls the contrast of each picture through the APL(Average Picture Level) as each image's dynamic range is identified and extended to produce a more bright, delicate and detailed picture.

OptiGrade technology offers a more detailed colour image by upping the bit rate from 8bit to 10bit. Standard 8bit processing offers 256 grades of brightness for each primary colour. LG says 10bit offers 1024 grades for each primary colour, corresponding to an increase in the number of possible colours from 16 million to 1.07 billion.

Several of the new range of TVs also have a box of tricks called Eye Intelligence. This, says the company, senses the amount of ambient light in the room and automatically adjusts the screen's contrast, brightness and sharpness to ensure the best viewing experience whatever the light conditions or position of the screen.

#### **The future**

In LG's home country of Korea home networking is beginning to emerge as a genuine phenomenon and LG has been at the forefront of this. In fact at LG headquarters there is a fully-working

# LG innovation



The 32 LB1D has two HDMI connections and Eye Intelligent technology

mock-up of a totally networked house where appliances can even be controlled remotely via a PC or Mobile phone. Alternatively a parent can control the use of TV and Internet within the home by locking the systems off from a master control panel. These systems are mostly aimed at the new-build integrated market and although progress has been quick in Korea, James Atkins says anything similar in the UK is a long way off. Still, networking is something LG wants to move the UK market ahead on and next year should see the introduction of a Wi-Fi enabled media centre to act as a storage and delivery platform for content around the home. James Atkins also says that LG is working on developing an 'N Version' of Wi-Fi that will increase bit rates, however timing on this will depend on the launch date of Windows Vista.

Regarding the ever looming controversy over Blu-ray and HD-DVD James Atkins says: "We are caught right in the crossfire. Basically it all depends on the Hollywood studios. Until they stick a flag firmly in the ground one way or another, it is difficult for us as a company to invest lots of money in developing a machine. We are officially a member of the Blu-ray camp, but to be honest that situation could change for almost any of the manufacturers."

As far as CRT is concerned, LG announced its decision to leave the format behind in terms of new product and production as far back as 2003. The company is completely out of CRT in the UK and believes it made the right decision, allowing it to concentrate on developing its flat panel lines. Still, logic dictates that there must still be a fare amount of LG CRT sets out there that will need servicing and repair in the future. James Atkins admits that back-to-base solutions are only part of the solution and that the company needs to deliver on the field service side as well and work is continuing to bring improvements here.

The company has also been one of the fastest to attach itself to the HD future, and already sells very little VGA in the UK. In fact LG says that the concept as a whole is slowly but surely becoming the de-facto standard with out the need to really push the technological side of the concept that hard. According to LG 62% of all flat panel sales from June 05 to May 2006 in the UK were HD panels.

Mobile TV is another area where LG has looked to lead, John Barton, Marketing Manager for LG Mobile explains: "LG are currently developing two formats for mobile TV, DMB and DVB-H. They are producing handsets

on both platforms. LG have handsets available with mobile TV but since the frequencies are not ready in the UK, these handsets are not available in the UK at present." The company completed trials in Europe during the World Cup which it says were a big success, so as soon as the opportunity presents itself LG are likely to want to expand into the UK as well.

## Key products

LG plans to back-up its technological advances with what it believes is a strong new line up in TVs for 2006. The highlights include the 32LB1D LCD TV with two HDMI connections and Eye Intelligent on-board, integrated speakers and the option of wall-mounting or set-up using the swivel stand.

The LC2D LCD TV series includes 47", 37" and 32" models and incorporates a speaker built into the lower edge of the screen and a wave design in a silver finish, intended to give the sets a curvaceous and slinky look. The really big guns come in the form of the PY2R series plasmas in 50" and 60" versions and the 42PC1D for a more affordable plasma option. All these are HD ready and carry the XD Engine and HDMI connections. The 42PC1D also has LG's 'Clear Filter' which replaces the traditional thick glass filter with a single thin film filter. This has been included to eliminate reflection, glare, double imaging and reduce the weight of the screen.

# **Fault** REPORTS

## TV/Satellite/DVD/VCR Faults

### **Test Case 526**

**John Parker**

**Chris Plaice**

**Michael Dranfield**

**Donald Bullock**

**John Coombes**

### **Solution to Test Case 526**

Toshiba 24W33B (chassis AK37)  
Philips 28PW6520/05  
Toshiba 28YT5 (chassis AK49)  
Philips 28PW6518/05 (chassis LO4E-AA)  
Toshiba 36ZP18Q  
Philips 32dw6559/05 (chassis LO4.E)  
Philips 36PW9308/05 (chassis EM5)  
Sony KV32DX30U  
Grundig 32WF8000 (chassis 2500)  
Philips 32PW6518/05  
LG44SZ8R DLP projector  
Compacts 14 TV/DVD Model P1430  
Gundig 28" widescreen, various models  
Panasonic TV model TX21  
Tatung 28" w/s, model 28ZKE  
Daewoo 28" w/s model DTZ2881  
Bush 28" TV, 2877 NTZ (AK37)

Matjuz DVD Recorder Model DVDR100  
Bush RF6684VPL  
Bush DVD144RC  
Akura NR AB28W-S  
Vestell (chassis 11AK37)  
Toshiba 36ZP38B  
Grundig GDS3000  
Pace BSKYB1000 mini box  
Sharp 28" CTV model 66GF63H (chassis DA50W)  
Philips 23" LCD TV model 23PF99445/12 (chassis LC03E)  
Black Diamond 28" CTV model MD2850PFS  
Alba 28" CTV model CTV6683 (chassis 11AK19E3)  
Samsung 21" CTV model CW2144TN (chassis KS3A)  
Philips 21" CTV model 21PT1663/05 (chassis L72EAA)  
Daewoo 28" CTV model DTY2880 (chassis CP520)  
Alba CTV model: CTV4851 (chassis 11AK19)  
Goodmans 28" CTV model W288NSA (chassis Formenti F19)  
Goodmans CD Player model Delta 800CD 11  
Toshiba DVD player model SD340ESB  
Goodmans model GTV34R3  
Philips model LC4,2E / LC4.3E LCD  
Philips model 32PW9618/05 (chassis EM6E)  
Toshiba model 28YT56 chassis 11AK49  
Goodmans model GTV76W2DT chassis 11AK33  
Panasonic model TX32LXD1 (chassis LH18)  
JVC model AV28ED5 chassis 11AK52  
Goodmans chassis FPC2001  
Goodmans model W322NS (chassis S19)  
JVC model HR-V616EK VCR  
Philips model VR765 VCR

# ELECTRONICS WORLD

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## JOHN PARKER

### Toshiba 24W33B (chassis AK37)

This was a simple fault. I had no picture and the HT rails were present along with the line and frame drive. The heater supply to the tube was missing, this was due to Plug PL600 on the main PCB near the LOPT being dry jointed along with the heater feed resistor R648 being dry jointed.

### Philips 28PW6520/05

This set had a straight forward fault,

no tuning or reception of any TV channels. Before diving into the circuit with your meter it's a good idea to check the option codes. These are on a label on the back of the tube. In my case these were correct. Next I checked tuner supply voltages along with its clock and data lines, all were correct. Replacing the tuner cured the fault.

### Toshiba 28YT5 (chassis AK49)

This set had a frame collapse. The frame IC IC601 (TDA8359J) had no supply voltage due to diode D610 being short circuit and R529

(0.47ohm) being open circuit. Replacing these parts cured the fault.

### Philips 28PW6518/05 (chassis LO4E-AA)

This set was totally dead. The fuse on the main PCB was blown. I found the chopper FET 7512 to be short circuit. I could not find any other damaged components. I did however find the chopper transformer 5512 to have several dry joints. Re-soldering these and replacing 7512 and the fuse got the set working. A soak test showed all was well.

## TEST CASE 526

VCR repairs are quite rare now, especially on machines which are not rented. It's not only because of the growing number of DVD recorders, but also a result of the ridiculously low price at which VHS machines have been selling in supermarkets. Dealer-collection and delivery of VCRs for repair is virtually unheard of these days. At a typical going rate of £25 it would make service even less viable. So how come this run-of-the-mill Philips VHS deck had been brought to the workshop in Todd's van from ten miles away? Because its owner had just purchased a couple of thousand quid's worth of Philips LCD screen, and this was on the van's return run from its delivery.

The model number was VR750, for which there was no service manual available in the workshop.

The symptom here was a simple one: no go. There was no sign of life, no pumping, no light-up on the front panel. Maybe a blown mains fuse or an open-circuit kick-start component was responsible here? Workshop Sage removed the top cover and the front panel and checked the mains fuse F001, T1.6A type. It was in-tact and conveying mains voltage to the bridge rectifier. After removing the deck and PC board from the cabinet, Sage established that there was about 320V at the primary reservoir capacitor C004 and at the drain of chopper FET Q001, which was not switching on. Our man found a wealth of high-value resistors around here: three 1MΩ in series, a couple of 390kΩ

types also in series, a 100kΩ and a 150kΩ. But none of them were faulty when (after discharging the reservoir capacitor) he tested them with an ohm-meter. The transistors and diodes in the PSU section measured OK and by this point the attempt at diagnosis had advanced about as far as it could without a service manual, or at least a circuit diagram.

So a manual was obtained, and with its help a more thorough check was made on the power supply section. But no faulty components were found. None of the semiconductors in the primary or secondary circuits were at fault, and a test with an oscilloscope showed that there was a quick burst of conduction in the power switching transistor at the moment of connection to mains power. The next check was for any heavy loads on the secondary circuits. Nothing obvious showed up, indeed had there been any such (at least amenable to meter checks) they would have been indicated in the in-situ secondary diode tests.

Whither now? Should the opto-coupler be checked or the chopper transformer by substitution? Was this repair project going to be worthwhile?

Maybe, because Sage found in his treasured scrap pile a very similar machine with damaged video heads. This could provide a complete supply of spares. First its PCB was tested for electrical operation. It was OK in the scrap machine, but 'dead' in the one on the bench. What ailed here? See page 732.

## **Toshiba 36ZP18Q**

This set was totally dead. I found fuse link Z898 to be open circuit. This was because a short circuit was present on the 5V rail which comes off voltage regulator Q840(L78MR05). Lifting various links in the main board and following the PCB track, I came to pin 47 of the main micro QAA1 (cxp750010). Un-soldering pin 47 removed the short circuit. The micro was short circuit on its supply pin 47, replacing this micro cured the fault.

## **Philips 32dw6559/05 (chassis LO4.E)**

This set had a bright white raster with flyback lines. The 200V supply rail was missing to the tube due to R3458 (4.7ohm) being open circuit, caused by diode D6453 being short circuit.

## **Philips 36PW9308/05 (chassis EM5)**

This set had no picture but with normal sound. I had red/green/blue video drive at the tube's cathodes, but there was no G2 voltage or heater supply. I had to replace the LOPT. Make sure you get the correct type as there are several and an incorrect LOPT can get no start-up or incorrect frame drive as was in my case. Replacing the LOPT and setting-up showed all was now well.

## **Sony KV32DX30U**

The picture on this set would start to flash after several hours. I first noticed on channel 4 digital and eventually on ITV analogue. Changing channels seemed to temporarily cure the fault. The picture had a strong red tint and adjusting the G2 control produced the fault. I had to replace the CRT, you have to also transfer over the scan coils from the old tube. The new tube does not come with any scan coils. Setting up the purity and convergence showed all was now well.

## **Grundig 32WF8000 (chassis 2500)**

This set would come out of standby, but would not produce any picture. The main HT rail was present at the line output transistor TL2, but there was no line drive at its base. I traced the line drive back to the line driver FET TL1. Line drive was at its gate but not at its drain. I measured the supply voltage to TL1 drain and it was at 0V. I found Resistor RL1 (15ohm) to be high in value at 22ohm along with zener diode DL12 and DL2 being short circuit. Replacement of these parts and a general solder up of the joints in the line and power supply stages showed all was well.

## **Philips 32PW6518/05**

After 5 minutes the picture and height contracted by 2". I found all the HT rails present and correct during the fault. Using freezer spray I found spraying around the Hercules IC IC7200(TDA1200) cured the fault. However closer inspection around IC7200 showed a surface mount resistor R3249 had never been soldered. It's a serial clock feed resistor to the audio stages. Why this poor joint affected the picture is a mystery.

## **LG44SZ8R DLP projector**

This digital light projector came in with the fault symptom of no SCART inputs on 1 to 3 and limited remote control functions. Using the service remote to access the service mode and with reference to the service manual, I found the area option code to be wrong. It was set to 1 when it should be set to 4. When you set the area code to 4 all other option bits are set appropriately. Once this was entered and stored, all functions returned including full use of the remote. I have now had this several times.

## **CHRIS PLAICE**

## **Compacts 14 TV/DVD Model P1430**

Set dead. The cause was a microscopic dry joint at the line output transistor base connection.

## **Gundig 28" widescreen, various models**

Line tearing, caused by C605 47pF 160V and C606 10pF 250V, in the power supply.

## **Panasonic TV model TX21**

SIT fault, set trips off intermittently. The cause was a dry joint on the earth-pin of the LOPT, the one that is separate to the other pins.

## **Tatung 28" w/s, model 28ZKE**

The fault was lack of width and slight curving at the sides. Also after a couple of minutes the picture had horizontal tearing which gave the appearance of two pictures side by side. It turned out to be due to RF21 being open circuit. It was discoloured and I had no info on this set, so by trial and error I found that a 33ohm fusible resistor worked best. The set worked fine and hasn't come back in! I also went over the line output stage to check for any dry joints.

## **Daewoo 28" w/s model DTZ2881**

Set dead, except for degauss hum at switch on and green "on" LED. No HT at line output transistor collector but HT going into LOPT. The cause was an invisible dry joint under the blob of solder at the line output transistor collector pin.

## **Bush 28" TV, 2877 NTZ (AK37)**

The complaint was that the set had been taking longer to start, with

funny noises and interference. On the bench the set was dead with just a faint, occasional squeak. Now I'm a firm believer in 'look before you leap', so I got out the trusty magnifying binocular headset and sure enough I instantly spotted C827, 4700pF 16V bulging. It's at the front centre of the PCB. I replaced it and the set was back to normal. This was one of those repairs where you put your hands together, look at the workshop ceiling and say thank you!

## Matjuz DVD Recorder Model DVDR100

Set dead, except for blue LED. The cause was an obviously bulging C14. I also replaced C14A next to it as a precaution.

## MICHAEL DRANFIELD

### Bush RF6684VPL

The customer that brought this set in said it was lightning damaged. She also brought in a Grundig GDS300 digibox, supposedly with a blown-up modem. When I removed the chassis of the TV, I spotted a burn in the line output stage R639 (10K) and C653 (47nF) had both burnt to a crisp. This was traced to a dry joint on C621 one of the capacitors in the east-west bridge circuit. This had caused all the scan current to flow through C621 R639, so without doubt there had been a lightning strike but it played no part in the failure of the TV. If it had failed at the same time it was just coincidence. After replacing the faulty components and checking the value of the capacitor that had the dry joint, the set came out of stand-by but was still dead with no line drive from the jungle chip IC403 (STV224C). I replaced this to no avail. Now R639, C621 forms a potential divider that pots down the line pulse and feeds it back to the micro for OSD sync and the jungle chip, but it seemed very unlikely

the micro was inhibiting the line drive. Every component between R639 and the jungle chip was found to be OK. The line pulse is also fed into a small stand-up 5 pin sub-panel marked on the diagram as PL407. Disconnecting pin 5 on this panel brought the set on (this is connected to a chip IC100 CD4538BCN). The set seems to work OK with this chip removed, but I fitted a new one anyway, my circuit has no diagram of this small sub panel.

### Bush DVD144RC

The complaint with this set was the remote control would work the DVD but not the T.V section. The fault turned out to be the remote control handset itself, a new one from SEME was not expensive and cured the problem.

### Akura NR AB28W-S

This set was tripping, the cause was a dry joint on one of the east-west diodes D507 (BY228). The diode itself had been damaged, it was leaky along with the line output transistor and the east-west feed resistor R516 (47ohm).

### Vestell (chassis 11AK37)

This set was a big Bush but I forgot to write down the model number, it was however fitted with the popular 11AK37 chassis and the customer complained of picture jitter which was intermittent. On test I noticed well before the picture jitter occurred that the frame linearity would change as the set warmed up. The top of the picture would be compressed, then after a couple of hours the picture would jitter vertically on channel change. The problem was caused by capacitor C604 (100uF 63V). One leg had not been pushed through the board from new. However, with this fixed the fault was still present. The frame output chip had also been damaged and had to be replaced IC601 (STV9306).

### Toshiba 36ZP38B

This monster set had an intermittent digital picture fault and I found that a slight tap on the digital module HX01 would make it come and go. The fault was traced to dry joints on the 208 pin chip, but as this was a big set and I didn't want it back in a hurry, I decided to re-flow all the other two 86 and 80 pin chips as well to provide a lasting cure.

### Satellite fault finding Grundig GDS3000

Wasted a lot of time on a wild goose chase with this box. The fault was no satellite signal received on the horizontal channels. On vertical channels the LNB voltage was 13.6V, but on the horizontal polarised channels there was only 15.35V instead of the usual 18V. Now the power supply in this model looks very much like the earlier models, but is in no way interchangeable. One of the black wires carries a voltage, while on earlier models all the blacks are earths. Much time was wasted trying to trace the LNB switching signal, which on earlier models is carried out by taking the green wire on the PSU either high or low. Eventually I found the green wire on the GDS3000 PSU is not connected to anything. Then I saw my mistake, on earlier models the LNB voltage is generated on the power supply itself, on the GDS3000 the LNB voltage is generated on the main board, not the power supply. Now with this out of the way fault finding was simple. Just trace the LNB voltage from the power supply to where it is switched. This led me to Q43, a surface mounted transistor which had an open circuit emitter connection. It is important to use the correct one though, a FMMT591A, don't use the one without the A on the end as the HFE is only 100 and for the A version its 300.

## **Pace BSKYB1000 mini-box.**

The customer who sent this box in complained of the picture freezing up. He also stated it was intermittent and if I left the box on channel 509 with a card inserted, I would see the fault. It seemed a bit odd to me as channel 509 does not need a card as it's a free channel. Sure enough after a couple of hours channel 509 started freezing on the picture and the sound would hiccup, sometimes it would say no satellite signal was been received. If I removed the viewing card the fault would disappear immediately. As this is a 12V box I tried it on my bench power supply. With the card inserted the box draws an extra 40 to 50mA so this explained why the viewing card caused a problem on a free channel. A scope detected a large ripple was occurring on the 5.7V rail when the viewing card was inserted. The problem was traced to capacitor C2910 that decouples the input to the 5V regulator I.C U2901. It was causing the 5V regulator chip to oscillate, beware though, this capacitor is not an electrolytic, it's a brown ceramic surface mount with a value of 10uF and is not polarised. I also replaced for good measure C2921 same type with ordinary low ESR electrolytics. Strangely enough the old capacitors tested OK both for capacitance and ESR.

**DONALD BULLOCK**

## **Sharp 28" CTV model 66GF63H (chassis DA50W)**

This solid monster was producing a pronounced hum from both its central and left speakers. Bringing a lifetime's prejudice to the fore we settled to studying the circuit's electrolytic capacitors.

We were soon rewarded when we discovered that C365, a 220uF 25V electrolytic rated at 25V working, was leaking to such a degree as to be virtually short-circuit. A

replacement did the trick, restoring the sound to the high quality standard one expects from this model.

## **Philips 23" LCD TV model 23PF99445/12 (chassis LC03E)**

This modern miracle would have pleased its owners more if it hadn't developed the habit of intermittently blanking out. A lengthy fault-finding spell failed to reveal a concrete component fault, and we eventually did what we should have done in the first place. We turned to the surface-mounted integrated circuits in its digital signal stages, painted their legs with liquid flux, and treated them to a dose of hot air from our hot-air station, which delivers a 480 degree air flow. In no time the existing solder re-flowed, re-establishing good continuity between the legs and the printed conductors. A lengthy soak test subsequently confirmed that the trouble had cleared.

## **Black Diamond 28" CTV model MD2850PFS**

This giant, we were assured, had suddenly erupted into a bout of frantic squealing before expiring after which it continued to squeal. Again we concentrated upon its electrolytic capacitors, directing our attention to those in its secondary supply circuits.

We were soon rewarded when we found that C173, a 1uF, 250V working electrolytic capacitors rated at 250V in the secondary power circuit, was of low capacity at 0.60uF. A new one stopped its squealing and restored it to life.

## **Alba 28" CTV model CTV6683 (chassis 11AK19E3)**

The customer complained that the set showed no screen illumination. Nevertheless, the line time-base was running and judicial 'upping' of the A1 voltage revealed that the real

trouble was a collapsed frame. This circuit is driven by the 15V rail developed at pin 5 of the LOPT and rectified by D806, a BA157 diode. In this case the diode had gone short-circuit. A new one restored its frame, its brightness and its owner's smile.

## **Samsung 21" CTV model CW2144TN (chassis KS3A)**

"How much will a new tube cost for this set?" asked the anxious customer. It was a pleasure, from his viewpoint and ours, when we were able to clear the tube and allay his fears. The set had developed a faint crackling noise before losing its picture and now displayed a bright screen relieved only by its flyback lines. The cracking sound had been due to R519 burning up and becoming open-circuit. It's a 0.47ohm safety resistor in the 200V supply line and it had expired because of the trauma visited upon it by IC501 suddenly developing an internal short-circuit. It's a type STV5109 and replacing both the resistor and the IC restored an excellent picture.

## **Philips 21" CTV model 21PT1663/05 (chassis L72EAA)**

"Blew its top and died", said its owner, with more accuracy than he knew. Upon opening it up we found quite a little local mess. C2518, a 470pF 1kV working capacitor, had suffered a dead short-circuit and blown open and in a chain reaction had caused R3506, its 4.7ohm 5W supply resistor, to expire as well going completely open-circuit. Replacing both items cured the problem.

## **Daewoo 28" CTV model DTY2880 (chassis CP520)**

"He made a noise like a whizzing Catherine-wheel and died in front of us," was the graphic description offered by the lady of the house. Was she mistaking me for the

doctor, I wondered? I darted my eyes about to catch a look at the victim, but saw only the huge and weighty television set. Upon examining it we found that component I800, a STRF6653 power IC had blown apart and taken the life of R804, a 0.22ohm safety resistor, which had flown open-circuit. Replacing these components was only half of the repair, for we were then obliged to re-programme the set's EPROM system.

### **Alba CTV model: CTV4851 (chassis 11AK19)**

This imposing servant had suddenly but quietly died whilst on dutiful service. Our examination revealed that R806, a substantial 10k 5W supply-resistor, had crept high to almost 1.5Mohms. Replacing it restored the set to life and it produced an excellent picture.

### **Goodmans 28" CTV model W288NSA (chassis Formenti F19)**

According to its aggravated owner, this set had issued a clicking noise as its picture suddenly turned to a brilliantly lit screen displaying only its flyback lines.

We soon found that R619, a 100ohm safety resistor in the 200V HT rail had blown open-circuit – but why? Our studies took us to a bloated and short-circuit IC600 on the tube base panel. It's an STV5112, and replacing both components cured both the cause and effect of this fault.

### **Goodmans CD Player model Delta 800CD 11**

This stacking-unit showed no sign of life except for its display and we expected to find a faulty motor drive belt. But the motor was un-powered. Whilst turning the unit over to examine it further, a metal-cased crystal dropped out. Examining it, we saw that it bore its operating frequency of 16.9344

megacycles, and that it had lost both of its legs due to some form of green corrosion. We chemically cleaned the stumps, soldered a pair of wire 'stilts' to them and after re-fitting the crystal we re-tried the player. It sprang to life and provided a fault-free performance whilst we obtained a replacement crystal.

### **Toshiba DVD player model SD340ESB**

No audio or clock display was the trouble with this DVD player. This was because the relevant circuitry was being fed with a severely rippled voltage. This in turn was due to an open-circuit C833, a 470uF 16V electrolytic capacitor in its power supply secondary circuit. A replacement restored both its 12V DC supply and proved most therapeutic to its owner, who had recently bought it from a shop that had soon afterwards folded.

## **JOHN COOMBES**

### **Goodmans model GTV34R3**

If the set is dead and the mains input fuse is alright, check the power supply for resistor RP4 (330kohms) for open circuit.

### **Philips model LC4,2E/ LC4.3E LCD**

If the battery life on the remote controls RC155 (312814715821) and RC4343 (313923810301) only last for 1 to 3 months, this is due to the TV LED lighting up for more than 60 seconds. To overcome this problem there is a new remote control with improved software supplied with the latter production of sets. The new remote controls are for LC4.2E (312814715822) and LC4.3E (313923810302) these will increase the battery life.

### **Philips model 32PW9618/05 (chassis EM6E)**

This set displayed an intermittent

red picture. This set spent many a hour working correctly and at times this turned into days before we even saw the fault. The greyscale altered with the red becoming very prominent, but this only appeared for a short time. With the aid of the freezer spray we finally traced the fault to the red output IC. Due to the heat of these components we changed all three R.G.B. IC7330, IC7340 and IC7350 (3 x TDA6118JF/N2/S1). Replacement restored normal operation.

### **Toshiba model 28YT56 chassis 11AK49**

The HT from the power supply was correct at (144V) with the line stage disconnected, but when the line stage was reconnected there was a loud whistle and the relay would click very loudly. We quickly traced this to the line output transistor Q600 (BU2508AF) which had gone short-circuit. Checking the LOPT T600, this also proved to be shorted turns. After replacement we thought this would then be alright but no, the HT (144V) still dropped low and the relay started to click loudly once again. On carefully touching the line output transistor it appeared to be getting very hot in a short space of time. This was soon traced to the scanning coils having gone shorted turns and this is all part of the C.R.T. assembly (W66ELC021X131). With the set still under warranty we were surprised to hear the C.R.T. was no longer available, so this meant a return to the manufacturer for credit.

### **Goodmans model GTV76W2DT chassis 11AK33**

If the set is tripping when first started up and the red LED flashes, check the power supply, secondly check capacitor C164 (4700uF,16V) for high E.S.R. If when the set is switched on the power supply just starts to tick,

check the primary circuitry and check capacitor C173 (1uF 250V) for high E.S.R.

### **Panasonic model TX32LXD1 (chassis LH18)**

If the set is dead then check for faulty power regulator IC801 (STRL351LF428), if this is faulty then also check resistor R808 (5.6ohm 5W) for open circuit.

### **JVC model AV28ED5 chassis 11AK52**

If the set is dead and the standby LED does not light up and IC804 (MC44608P) has split open, then replace the following in the power supply. IC804, Q802 (P6NC60FP), R834 (1kohm SMD), R806 (10ohms), D802 (HER107) and opto

coupler IC801 (TCET110G). Also replace mains input fuse to restore normal operation.

If the power supply transistor Q802 (P6NC601F) and resistor R448 (0.22 ohms) fail when set is switched on check capacitor C809 (470pF 1kV) for short circuit.

### **Goodmans chassis FPC2001**

If the set is dead and transistor TR19 (S2055N) is short circuit and resistor r168 (6.8kohms) is badly burnt, this is caused by dry-joints on capacitor C172 (.015uF). Re-soldering capacitor and replacing components will restore normal operation.

### **Goodmans model W322NS (chassis S19)**

If there is no picture, but a raster is

present and also there is sound, check resistor R35 (12kohms) for open circuit.

### **JVC model HR-V616EK VCR**

VCR was dead. This problem I have encountered before on several occasions. It seems to occur when we have had a storm or in some cases a power cut. This can be traced to zener diode D5301 (MTZJ15C-T2) having gone short-circuit.

### **Philips model VR765 VCR**

VCR was dead. Check the power supply, if this is dead the fault can usually be traced to diode D6165 (BYW98/200 ) check for short-circuit.

## SOLUTION TO TEST CASE 526

Workshop Sage was amazed to find that the known good electronics of the scrap VCR failed to work with the mechanics of the other machine. The obvious thing to do then was to connect together the scrap deck and the customer's PC board. This was not easy, even though the deck and PC board are hard-wired together to achieve low factory production costs. It was found that these two worked perfectly well together, so the no-go, no light-up symptom was due to some problem in the customer's mechanical deck rather than the

electronic section. You might think that the result of this would be a 'pumping' action in the power-supply department rather than complete shutdown.

One by one the electrical components of the deck were checked by substitution: the loading, head-drum and capstan motors. It was the latter which was the culprit, with some kind of internal leakage or short-circuit. The cost of acquiring and fitting a new motor would have been prohibitive, but the customer settled for the motor from the scrap deck, with a three-month guarantee.

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# NEWS special

Ofcom has published its annual Communications Market Report for 2005. The report reveals new trends in the television, radio, telecommunications and wireless communications industries and analyses consumer usage of communication services.

**H**ousehold usage and adoption of communications services continues to accelerate. The number of households with broadband connections increased by 63% between 2004 and 2005, to a total of 9 million and the number of households with digital television also increased by 18% between March 2005 and March 2006, to a total of 18.3 million.

The report also revealed what it described as striking evidence that a new 'networked generation' is turning away from television, radio and newspapers in favour of online services, preferring to download content onto mobile devices or interact with on-line communities. Perhaps even more surprising is that the report concluded that television is of declining interest to many 16-24 year olds. On average they watch television for one hour less per day than the national average. Of the television they do watch, an even smaller proportion of their time is spent viewing public service broadcasting channels, down from 74% of total viewing among this age group in 2001 to 58% today.

It is the internet that increasingly is playing the central role in younger age groups. More than 70% of 16-24 year old internet users log-on to social



Flagship shows like the *Today Programme* have been strong for BBC radio

networking websites (compared to 41% of all UK internet users) and 37% of 18-24 year olds have contributed to a blog or website message board (compared to 14% of all UK internet users).

Extensive use of the internet has also influenced 15-24 year olds' consumption of other media, with radio consumption lower by an average of 15 minutes a day compared to the wider population.

### BBC radio waving goodbye to opposition

The gap between total BBC and commercial radio audience share widened even further in 2005. By March 2006 the BBC led the commercial sector by a margin of 30%, up from 24% a year previously. Compared to 2001, when the margin was 13% in the BBC's favour, the gap has more than doubled.

Total radio industry funding (including the BBC Licence Fee) fell by 2.2% during the last year to £1.15 billion. The BBC's expenditure on its radio services now accounts for around 55% of total UK radio funding.

DAB digital radio continues to grow in importance (see the conclusion of the DRDB's annual report on page 706). For the first time, sales of DAB portable radios outstripped sales of analogue portable radios in 2005 (accounting for 54% of sales, up from 45% in 2004). Overall digital listening (including radio channels via digital television) accounted for 11% of all listening hours in 2005, compared to 6% in 2004.

### Television diversifies

Despite the BBC's strong showing in radio, a more mixed picture was apparent in terms of television viewing habits. The report found that in Freeview households more time is now spent watching digital-only channels than any one of the five main public service broadcasting channels BBC1, BBC2, ITV1, Channel 4 and five. However, the public service broadcasters' own digital-only channels (such as BBC3, ITV2 and More4) continue to grow their audience share, gaining nearly 6% points of total viewing between 2001 and 2005.

Subscription revenue remains the largest source of funding for commercial television, with 2005 revenues up by 8.5% to £3.9 billion for all pay TV services, £343 million more than total net television advertising revenues for the same period. Overall, television industry revenues increased by 4% year-on-year to more than £10.6 billion.

Ofcom chief operating officer Ed Richards, believes that taken as a whole the report reveals significant and permanent changes: "Our research reveals dramatic and accelerating changes across all communications industries.

"The sector is being transformed by greater competition, falling prices and the erosion of traditional revenues and audiences. A new generation of consumers is emerging for whom online is the lead medium and convergence is instinctive."

# Keeping **Pace** with technology

Steve Jenkins, chief technologist, cabled systems, Pace Micro Technologies, argues that the company has the answer to the problems of distributing TV and other digital content around multiple-dwelling buildings

Even though around 50% of the world's population lives in multi-dwelling units (MDUs), when it comes to providing advanced digital services their residents are often considered to be a hard-to-reach market and therefore receive an inferior service. One reason for this has always been socio-economic demography. People living in MDUs typically have had less disposable income than those in single family units (SFUs). In recent years this has begun to change as it has become more fashionable, convenient and exclusive to live in

urban areas. The appetite to redevelop existing buildings and brown-field sites is fuelled by the protection of green-field sites and increased travel times and costs.

Another factor is that it is more difficult to provide services into MDUs than SFUs as additional specialist equipment and skills are often required, thereby incurring additional cost. The dominant proportions of the costs are from labour and the administration involved in getting authorisation from all involved parties.

Possibly the main reason that digital services in MDUs lag behind, is because service providers naturally ramp up their subscriber numbers starting with the lowest acquisition costs. In many countries pay-TV operators are approaching subscriber saturation and are now targeting MDU residents to grow their business.

## Satellite TV

There are a number of approaches to providing satellite TV services within MDUs. The most simple is to treat each household as an SFU by installing a dish for each individual subscriber, usually on the balcony. There are a few pitfalls to this approach however. What if the balcony does not have a line-of-sight to the satellite? Also there is often

government legislation or building rules that either ban individual dishes or limit them to specific areas such as the roof.

Analogue transmodulation converts a limited bouquet of channels from digital to analogue, but this is not popular with service operators as they have no sight of the end users and often suffers from a poor picture. Digital transmodulation often has similar visibility issues and is an expensive option.

A more popular choice is a structured cabling system such as Satellite Master Antenna Television (SMATV) shown in Figure 1. In this system one coax per satellite quadrant provides all channels at intermediate frequency (IF) to a multi-switch. The multi-switch switches the appropriate quadrant spectrum onto the coax drop, which connects to the household's wall plate. Due to the number of coax cables involved (five for one orbital position, nine for two positions etc) there are often access problems in routing a 5-wire bus around the building. Furthermore, most installations only provide a single drop-cable per household, which makes it impossible for operators to increase their revenue through PVR or a secondary STB, without upgrading the system.

Satellite single cable distribution



(SCD) is a recent development designed to address the PVR/secondary STB issue. This works best when the single cable services a single household. However, this is unsuitable for communal systems due to limited number of clients supported, channel change latency and frequency theft.

### Cable TV/IPTV, HD and broadband

Cable operators generally treat their MDU customers in the same way as SFU customers by running a connection direct from the street to the customer's wall plate. This approach is only suitable for ground and first floor dwellings because of rules governing ladder heights. The cost of connecting subsequent floors from access platforms makes the connection impractical.

Tethered IP services are almost exclusively carried over unshielded twisted pair (UTP) cable from a telephone exchange. However, many MDU residents do not have land-lines and rely on mobiles. In larger buildings the additional UTP loop length reduces the headline data rate thereby limiting service capability. One remedy would be to install an additional network such as CAT6 or fibre, but the cost of this is prohibitive in most situations.

Many countries are now rolling out HDTV services. HDTV provides more than four times the resolution of standard definition (SD) MPEG-2, and even with an advanced codec such as H.264 it can still require about three times the bandwidth of SD MPEG-2 content. The additional capacity required to carry HD or services like video on demand (VOD) and network PVR is often not available in MDU infrastructures.

World-wide, Internet service data rates tend to double approximately every two years. This means that by 2016 the average connection will be 64Mb/s with high-end rates of 256Mb/s. This poses a huge

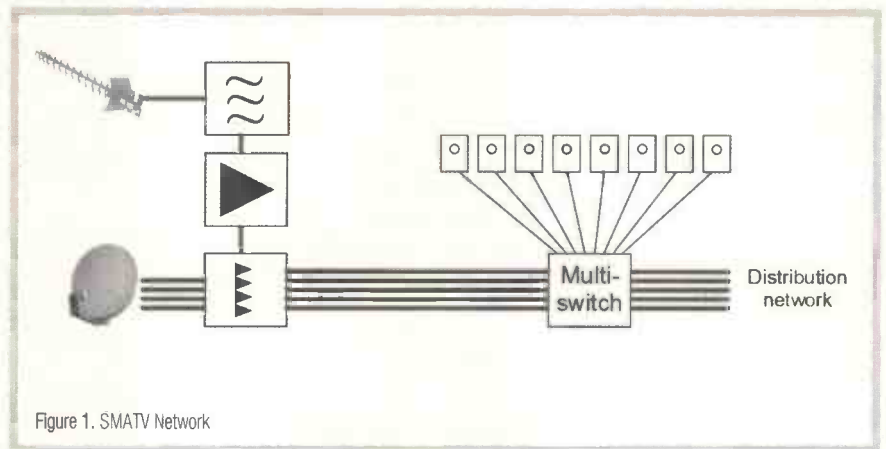


Figure 1. SMATV Network

challenge in the final/first mile access network. Today's services are generally delivered using ADSL or ADSL 2+ over local loops that are up to 6km in length. The only technology available today to provide the minimum 64Mb/p in 2016 is VDSL 2 which will be capable of providing 100Mb/s over UTP cables no longer than 100 meters. This short-length capability relies on massive investment to provide fibre deployment very deep into the network. Of course technology will have advanced by then, and equipment costs will decrease, but manual labour rates are likely to increase.

### Fulfilling future requirements

It is assumed that services in the future will be multi-play.

A system that provides multi-play services to an MDU must deliver in three key areas. Firstly, the system should be fast and simple to install. Ideally there should be no additional infrastructure to install, and services should be carried on whatever is already available. There should only be one single point of power for any additional network equipment and the installation and commissioning of the system should not be dependent on any specialist skills or tools. The installation must cause no disruption to tenants, both in public and private areas. Infrastructure equipment should remain maintenance-free for ten years minimum.

Secondly, there should be no disruption to existing services and any new services must not interfere

with legacy services already being provided. Users should be able to extend services to other rooms without loss of quality.

Thirdly, it should not be necessary to alter the infrastructure at any time in the future when; a new subscription is made by a new or existing customer, a customer wishes to alter their subscription, or an operator offers additional services.

The simple way to provide more is to install more. Satellite services can be supplied using SMATV systems with multiple drop cables per household. Cable services can be provided if the operators install bidirectional high frequency networks into all buildings. Similarly IPTV operators can install FTTx infrastructures to provide high bandwidth. Again the cost here can be unattractive.

A second way that is not dependent on labour cost is to extend the data carrying capacity of the networks already in place. This would involve either using higher frequencies or more elaborate modulation schemes. This technique is the basis of xDSL, but bandwidth is only increased over short loop lengths. Cable and satellite operators cannot provide their services directly over an existing MDU network simply because they do not fit. A typical satellite operator may transmit more than 50 transponders at 36MHz wide, which requires 1.8GHz of spectrum. Similarly cable operators generally require 870MHz of spectrum. The existing infrastructure that comes closest to

Description	Spectrum (MHz)	Frequency band (MHz)
5 intentional analogue TV channels	40	470-870
5 unwanted TV channels from a local repeater	40	470-870
6 DTTV multiplexes	48	470-870
DAB	66	174-240
FM	20	88-108
	<b>Total</b>	<b>214</b>

Table 1

Modulation	Bitrate
64-QAM	38Mb/s
256-QAM	51Mb/s

Table 2

Number of households in the MDU	20
Number of Pay TV subscriptions	10
Average number of simultaneous TV services per subscriber	4
Maximum number of simultaneous TV programmes in MDU	40
HD bit rate for one programme (H264)	9 Mb/s
HDTV bit rate for MDU	360 Mb/s
Number of broadband subscriptions	10
Headline data rate per subscriber	30Mb/s
Usage profile (max amount of resource in use at any time)	20%
Broadband bit rate for MDU	60Mb/s
Total bit rate required in MDU	460Mb/s

Table 3: Example of service requirements for an MDU in five years time



Figure 2. The Pace multiDweller system

being able to provide this performance is the Master Antenna Television (MATV) network, already in place in many MDUs. However, this is typically unidirectional, carries terrestrial services and is often band-limited.

The only option that meets all the necessary requirements is to use existing infrastructure in an intelligent way that permits all services to be carried without the need for labour intensive infrastructure modification.

### Intelligent use of MATV is the answer

The only ubiquitous 'no new wires' mechanism available to deliver multi-play services reliably is the existing MATV network. This is coax-based and is generally designed to carry signals in the down-stream direction in the approximate frequency range of 50 to 870MHz. Of course, some of the spectrum is allocated to analogue and digital terrestrial TV, FM, DAB and locally inserted services such as security

cameras, but there is a lot of free spectrum available. In the UK a typical MATV network might carry the signals in Table 1. In this case, the total spectrum available would be:  $[870 - 50] - [214] = 606\text{MHz} = 75 \times 8\text{MHz}$  channels.

Not all of this spectrum is usable due to interference caused by noise, intermodulation distortion and unwanted transmission sources.

Many service providers have more content available today than will fit in the available spectrum on the MATV network, and even those who could manage this have expansion plans in excess of the available spectrum. What this means is that the content passing onto the MATV network must be managed in an efficient manner.

The most efficient method is to pass only the content that people are consuming onto the network in real time. For example, if the only non-terrestrial service that residents were consuming was MTV, then only that programme would be passed to the MATV network. However, if one resident changed channel, a second programme would be instantly switched through. This requires an intelligent mini head-end to receive programme change requests and to perform the tuning and switching functions.

Using this content switching philosophy we can significantly reduce the amount of bandwidth required to carry all the services requested by the end users.

The obvious choice to carry data over a coax network in the UHF and VHF bands is QAM, which is the same technology used in digital cable systems. Depending on the depth of QAM modulation, different data rates are possible. With 8MHz channels, the payload capacity for a single channel is shown in Table 2. Table 3 shows some assumptions that can be made to identify the data bandwidth required to supply typical service requirements, in this case based on high bandwidth HDTV signals.

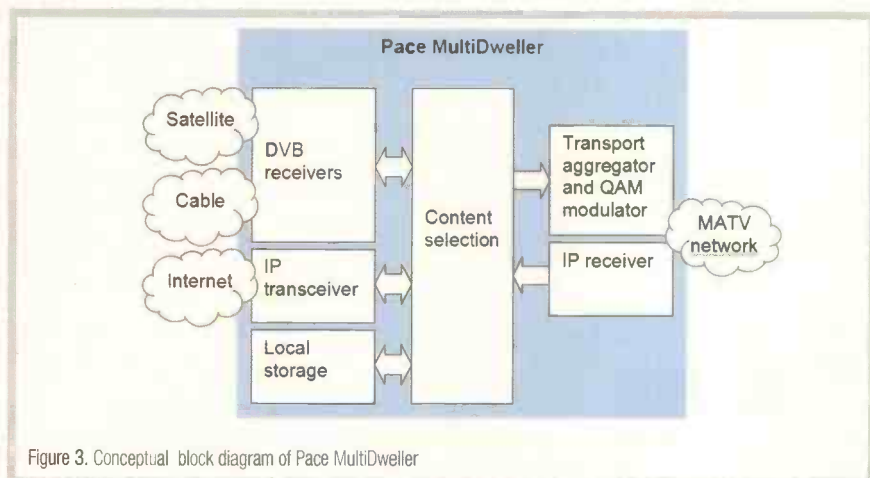


Figure 3. Conceptual block diagram of Pace MultiDweller

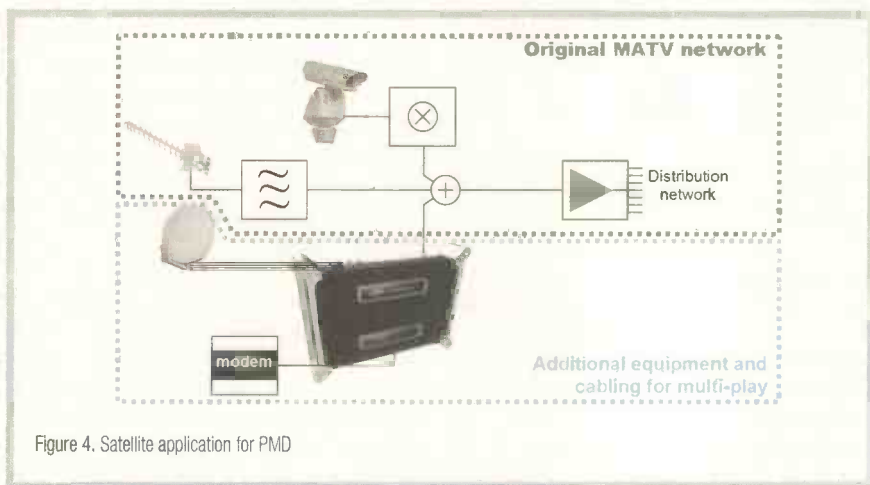


Figure 4. Satellite application for PMD

### MDU multi-play system solution

To provide the services outlined in Table 3, using 256-QAM would therefore require ten channels. Considering there is spare capacity for around 75 channels on the MATV network, intelligent bandwidth management would require only 14% of this capacity to deliver an unlimited choice of TV content and broadband access, while maintaining all legacy terrestrial transmissions.

The Pace MultiDweller (PMD) is a technology designed to receive any signal from DVB and IP sources, and switch them onto the MATV network in response to requests from client devices (Figure 2).

Put simply, the PMD demodulates, de-multiplexes, re-multiplexes and re-modulates the services selected by each of the clients available in the network. The various audio, video and data components of DVB programmes are carried in an MPEG2 Transport Stream, and are uniquely identified by their PID. When a service is selected by the client, the relevant programme components are selected from the appropriate source, and

then routed to the transport aggregator inside the PMD (Figure 3). Because the transport stream does not need to be decrypted, the conditional access (CA) functionality employed by pay-TV operators is unaffected by the PMD. The STB decodes the CA protected signals in the same way as when connected directly to the receiving antenna.

Similarly, IP data from the internet, and content from the optional local storage device, can also be included in the same transport aggregation. The interface for broadband data is a gigabit Ethernet port which enables connection to the internet through a variety of interfaces such as xDSL, cable, WiMAX, mobile networks and satellite return channel.

Because PMD re-organises channels to appear at different frequencies, the broadcast service information, which allows the STB to select specific programmes and build the electronic Programme Guide (EPG), also has to be modified. PMD has a service information (SI) manager that caches the SI and modifies the channel information accordingly.

### Installation and commissioning

Figure 4 shows a satellite application for PMD. The installation work is minimal because PMD automatically adds its digital carriers into unused spectrum on the MATV network. During set-up, PMD carries out a spectral analysis of the network to identify the frequencies and powers of legacy signals. It then assigns its own carriers to the optimal frequencies at power levels where no mutual interference is caused between new and legacy carriers. Once the downstream carriers are present, the client devices detect the signal and then begin the sign-on process.

Communication in the upstream direction is at lower frequencies, similar to CATV networks. This allows the upstream signal to be transmitted at high power levels so that network irregularities such as one-way amplifiers, splitters and cable losses can be overcome.

Significant analysis, simulation and trial work has shown that the system can overcome around 80dB of upstream loss without causing the distribution amplifiers to distort. While in-built diplexers protect the system's downstream receivers, an in-line filter is required to protect legacy receivers.

### Clients

In a rapidly changing market, inventory management is of utmost importance to operators. Currently a typical operator may be supporting a large range of products such as SD, HD, SD-PVR, HD-PVR and modems, these are usually sources from multiple providers, and of course there are legacy devices to consider. It is not unusual for an operator to be managing more than 40 product variants.

Since PMD operates in a similar way to a typical CATV network, then a cable operator's standard DOCSIS set-top boxes and modems are

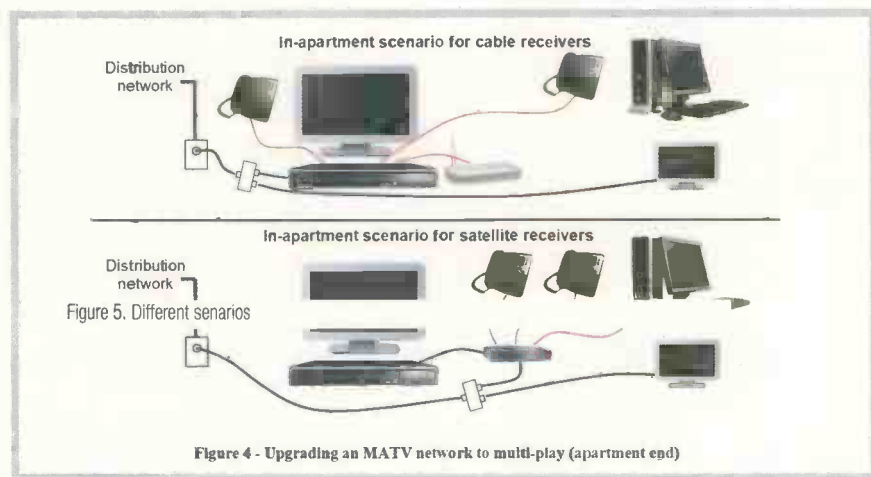


Figure 5. Different scenarios

Figure 4 - Upgrading an MATV network to multi-play (apartment end)

compatible with PMD, which means no addition to the existing operator product inventory is required (Figure 5). Current STBs include an Ethernet port which can be connected to a wired or wireless router to provide broadband throughout the household as shown in Figure 5. Alternatively embedded Multi-Media Adapters (eMTA) can be deployed which provide an Ethernet connection and two separate phone lines for POTS.

Satellite operators also have the option to use QAM clients, but an alternative approach is to use an adapter device. This adapter translates the QAM transport into a form that the satellite operator's standard clients can operate with. The adapter also provides an Ethernet connection to a wired or wireless router that provides broadband throughout the household, and two separate phone lines for POTS.

### Delivering the desired capabilities

The ability of PMD to self-install, self configure and to operate over the MATV network satisfies many of the high-level requirements needed, in particular those relating to cost. It is widely accepted that the cost of technology typically decreases over time, whereas the cost of labour typically increases. From now until 2012 most of the world's

governments will be implementing analogue terrestrial to digital switchover strategies. This mammoth task and aggressive timescale, means that there are not enough installers to carry out the necessary work and prices are escalating rapidly.

The most successful solutions will be those that can be installed quickly. Since PMD is a 'no-new-wires' solution that does not require access to be gained to individual homes, it can be installed in a fraction of the time of solutions that require new infrastructure.

With current systems, operators consider the cost of providing secondary boxes, or new subscriptions where there is not already cabling installed, to be prohibitive.

This is because the infrastructure requires modification by a professional installer. In its simplest form this entails the installation of a new coax drop from the SMATV or cable network, gaining access to the building and apartment, running the cable in existing conduit or fixing to the surfaces, drilling holes, mounting and terminating the wall plate then finally installing the STB. This is before any potential problems such as insufficient RF taps, or insufficient system gain to compensate for additional splitters, have been tackled.

PMD overcomes all these complications because there is already an MATV outlet in each apartment. Installation simply involves removing the MATV feed from the TV set and putting it into the client. A secondary installation requires an inexpensive standard splitter to be installed after the wall plate, which does not affect the signal levels in other apartments.

Another difficult task for traditional systems would be to introduce more services. SMATV systems are designed to carry quadrants of satellite signals, typically high-band and low-band in horizontal and vertical polarisations. If a satellite operator was to roll out new services in a new quadrant, this would require infrastructure upgrade.

For cable operators new services also typically means the use of higher frequencies. In MDU's where the infrastructure is incapable of carrying higher frequencies, again infrastructure upgrade is required.

PMD is designed to handle these situations. Additional transponders from the same orbital position are automatically provisioned, whereas signals from an alternative orbital position can be provisioned to the entire MDU without the need to run additional cabling. Higher frequency channels are managed automatically for cable networks because PMD is provisioned to receive all channels. In both cases increased channel choice will not overload the MATV network, because more available services does not mean residents will be watching more channels simultaneously.

Currently, the complexity and cost of solutions preclude many services being extended to MDUs. The Pace MultiDweller overcomes all of the difficulties associated with MDUs in an extremely reliable and cost efficient manner – with 'no new wires'!

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# Soft machines

Broadcast solutions expert Hamlet is introducing software to free broadcast testing from its machine specific past

Test equipment installed in a television facility has a traditional form factor as well as traditional functionality. The two key instruments – the waveform monitor and the vectorscope – were often to be found side by side, in identical cabinets, each a half rack width and 3U high.

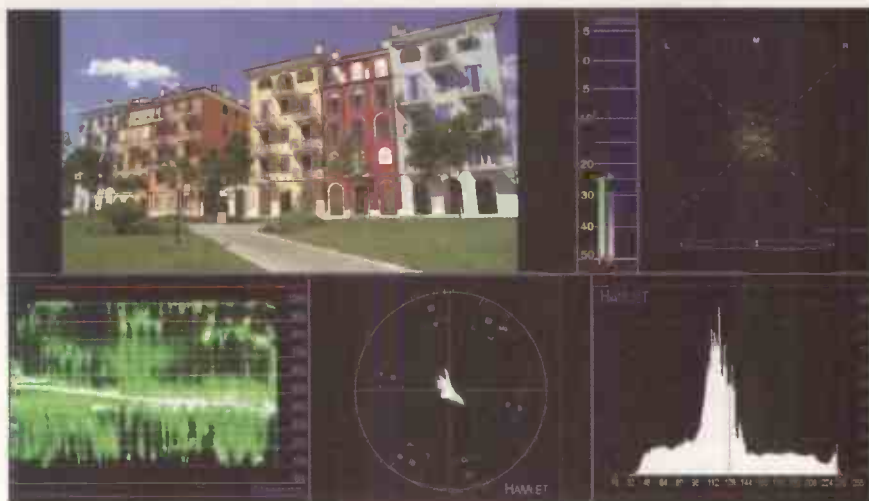
Hamlet continues to make devices that match this shape, albeit with LCD displays rather than CRTs, thereby eliminating the need to recalibrate the screen at regular intervals. We did start a move to break out of this straitjacket, by developing tools which delivered the output to a separate display, which could be routed and placed anywhere.

However, advances in digital technology have called for new sorts of quality control devices, and parallel advances in processing power have led to new ways of implementing them. For example handheld instruments like the Flexiscope make the vectorscope and waveform monitor completely portable.

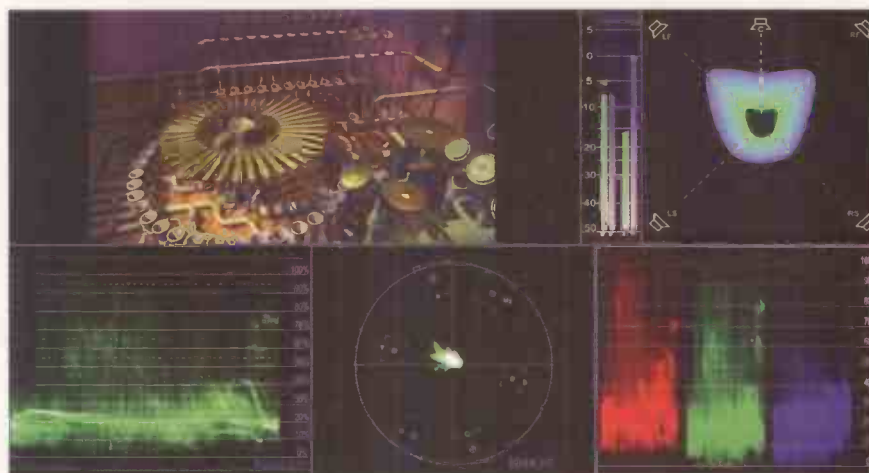
The logical conclusion of this process is that, as computing power gets faster, so the application-specific hardware of a test device can be discarded altogether and the metering implemented purely in software. That is what we have done with a new product, VidScope-vx, an integrated suite of Windows programs which decode, analyse and display video content.

## The big idea

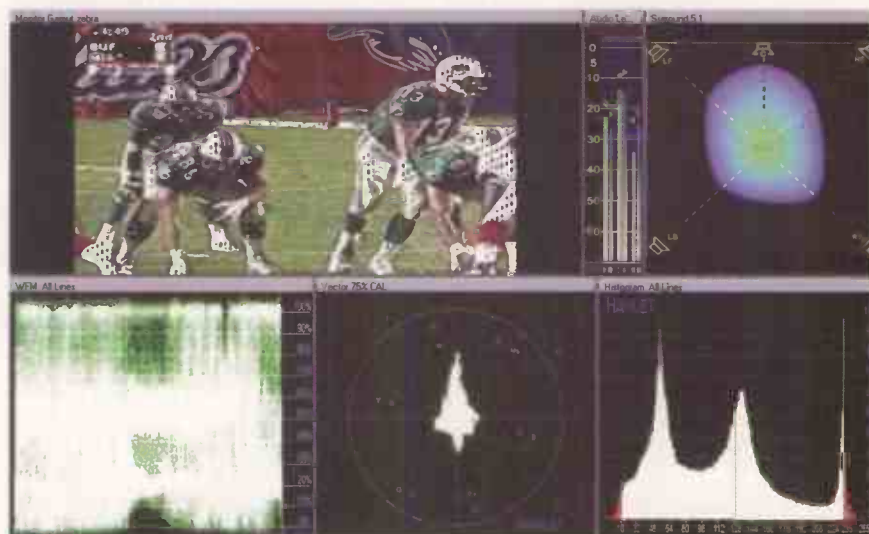
The initial concept grew out of the growing interest in DV, which is really a



Hamlet says VidScope-vx can deliver big savings



VidScope-vx migrates testing from hardware to a software environment



Hamlet's software displays multiple information streams

# The VidScope-vx

file format rather than a video format. The connection between the camera and the editor is a data interface: Firewire (IEEE 1394), so why not treat the content as data rather than real time video?

We found that engineers liked the concept and wanted it for other formats. Therefore we have extended the capabilities so that now VidScope-vx can act on content in any format that Windows drivers can see. That content could be DV or HDV over Firewire, a real time digital video or high definition feed, an analogue capture card or – and this is a significant point – files stored on the computer or its attached storage. Variants of VidScope-vx are available for HD-SDI and dual-link HD, SDI, DV and HDV.

Provided the PC has sufficient processing power, it can operate in real time. Interestingly, the biggest challenge is HDV in that the software has to unpack the compressed format before it can start its measurements. For HD and HDV a Dual Core processor is recommended because of the sheer amount of data to be handled.

The output of VidScope-vx is a multi-window display on a standard computer monitor. The user can layout up to six windows as required, including a confidence monitor (the picture itself), vectorscope, waveform monitor, colour gamut display, digital data statistics, audio levels and surround sound phase. The windows can be resized to meet the user's needs.

Users can highlight on screen out of specification readings. The audio meters can literally go into the red, for example. Colours which are outside the legal colour gamut in the broadcast system are made to sparkle with zebra stripes.

High definition television usually features 5.1 channel surround sound, which is a nightmare to monitor as you have to check relative phases between each channel as well as their relative and absolute levels. Included in the HD version of VidScope-vx is a new way of audio metering which is unique to Hamlet.

It uses both shape and colour to give an instant visual guide to level and phase. The sound intensity is displayed as a

polar locus, with the phase correlation superimposed into it and with a colour audio spectrogram rendered into it.

You can monitor quality in real time just as you would with a conventional device, or you can load the material into the PC and check it later. To move through files the user interface has video recorder-like transport controls. These can also be used to control a camcorder or other device over Firewire.

To obtain real time performance the code within VidScope-VX has been carefully tuned by Hamlet's software developers. The principle analysis core is written in SSE2 assembly code to achieve the maximum throughput. Displays use the pixel and vertex shaders in the 3D processing engine within the PC's GPU.

## The advantages

At the beginning of this article it was noted that Hamlet continues to make the traditional form factor test and measurement equipment and some more modern implementations of the same systems. What, then, is the point of VidScope-VX, a software-only implementation?

The first is cost. The vast economies of scale present in the IT industry mean that even today's high powered PCs can be manufactured at remarkably low prices. Add a professional third-party video interface board and the VidScope-vx software, and you have a comprehensive test and measurement solution at considerably less cost than is normal, which still delivers the same uncompromised technical standards.

The second point is that the software does not care where the video comes from, as long as it is available to the processor. Files stored on disk, either locally or over a network, in any format that Windows drivers can handle, can be analysed by VidScope-vx.

One of the biggest trends in broadcast engineering at present is the move to a tape-free environment. Digital content can be stored as files in an IT infrastructure and moved short or long distances using IP networks.

At present content producers will typically deliver programmes to a broadcaster as a pile of tapes. Someone

at the production company has had to create those tapes, a courier company has had to be paid to deliver the tapes, then someone at the broadcaster has to copy the tapes into the video server. That is why broadcasters are very keen for all content – commercials and trailers as well as programmes – to be delivered as files over IP networks direct into the broadcaster's server network.

The one problem is that, while ingesting the content into the server, the broadcaster's engineer can do a technical audit checking the waveform monitor, vectorscope and audio meters to make sure that the programme is technically up to standard. If there is no manual ingest process, how is the content quality checked?

VidScope-vx can perform the technical audit offline, automatically and unattended. All the quality control tasks are performed in a single pass, and if there are any problems they are reported, with matching time codes, to the asset management system. Given a powerful enough computer, this can even happen faster than real time, with an operator only involved if there is a technical issue to be resolved.

As a software product, it will continue to evolve in functionality and at the same time it benefits fully from increases in processing power of the host computer. With today's computers VidScope-vx is capable of processing two or three SD channels simultaneously. With continuing development of CPU and GPU speeds, and VidScope software, processing two channels of HD simultaneously or processing HD at twice real time or faster, is foreseeable soon.

VidScope-vx is available in a number of versions. If the engineer just wants to check DV content, the software can be downloaded from the Hamlet website. To measure anything else then a specialist video card in the computer is needed from companies such as Blackmagic Design.

The software is then delivered on a USB stick and runs direct from the stick. It means the engineer can move the software around from computer to computer as needed without worrying about user licences.

Under WEEE retailers will be obliged to accept old products



*Television* takes a look at some of the implications of the European directive on Waste Electrical and Electronic Equipment (WEEE)

# A **WEEE** problem

It has finally been announced that the WEEE directive legislation will come into force on July 1, 2007. Speaking at the announcement in July, Energy Minister, Malcolm Wicks, said: "Electrical equipment is the fastest growing category of rubbish across the European Union, with around 20kg per person produced every year. The UK alone is now generating around 1million tonnes of the stuff every year.

"These proposals are good for consumers, good for responsible producers and good for our environment. By providing a way of ensuring that electronic waste no longer has to go to landfills, manufacturers and importers will have the responsibility to ensure that they plan for both their new and existing products to be recycled

rather than dumped."

However, what the above statement does not address is the impact that new obligations on retailers might have.

Under the scheme retailers (large or small) will act an exchange site for old products. If a retailer sells a new product, the consumer will have the right to exchange their equivalent old product upon collection or delivery of the new product. This will apply even if the original product was not bought from that outlet. Retailers will then have to store the product until it can be fed back into the distributor takeback scheme. This will funnel old product into the main recycling process. How this will actually work is not presently clear. Apart from the storage, this part of the scheme will not cost retailers. But

there has been much concern voiced over the impact the obligation will have, particularly on smaller operations. However, it is worth noting that the scheme does appear to be working in Ireland, which to a large extent is an independent led retail environment.

The other significant change, this time for the manufacturers, is that the directive introduces producer responsibility for the waste. Producers will have to finance treatment and recycling/recovery of separately collected WEEE in the UK to specified treatment standards and recycling/recovery targets. This has received mixed reactions amongst the major producers, which appears to have been one of the main factors in the



Government delaying publication until it was confident it could get relatively trouble free compliance. One of the incentives for manufacturers to reach the targets set is the proposal for: 'an end-of-year settlement to ensure producers are able to meet their obligations via an exchange system'. This means that producers will have a yearly target for the percentage of the total waste recycled based on its market share of products sold. If the target is exceeded manufacturers will be able to 'sell' their excess to other companies who have not met their targets.

The proposals have left the general consumer relatively untouched with no legal responsibility to comply with the scheme. Householders will still be able to dispose of products by throwing them away with general domestic rubbish.

So the main body of the proposal is now in the open. However, with such a complex nexus of stakeholders involved, the workability of the scheme is likely to only become apparent when actually put into practice.

## The Government says the key proposals are:

- A national distributor takeback scheme which will establish a network of designated collection facilities enabling consumers to return their used items for recycling or reuse.
- Obligatory registration for producers through approved compliance schemes
- Authorised treatment facilities, which will process WEEE and provide evidence to producers on the amount of WEEE received for treatment
- Accredited reprocessing/recycling facilities who will provide evidence of reprocessing to producers
- A voluntary approach for producers to show the cost of handling historical WEEE.



## PLEASE ENSURE YOU TELEPHONE TO CHECK AVAILABILITY OF EQUIPMENT BEFORE ORDERING OR CALLING.

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Every month *Television* looks at some of the more technically impressive, highly engineered or just plain mind boggling products launched onto the market

## Marantz WEAVES a new product story

Hi-fi and home cinema manufacturer Marantz, has unveiled a new innovation which it reckons is as ingenious as it is simple to use. The Wired Entertainment Accessible via Electricity or WEAVE products mean music can be played around the home taking advantage of the one network every house already has pre-installed – the mains.

Marantz calls the technology behind the idea Power Line Communication (PLC) and the system is comprised of two main elements. At the core of the user's main A/V system there must be a WEAVE amplifier or receiver, for example the company's the ZR6001 A/V. The main system can then feed audio signals from a CD, radio or any other signal via the mains to its little portable cousin the ZC4001 receptor. The user can add as many as six receptor units to deliver music around the home without going down the Wi-Fi or multi-zone custom installation route.

The WEAVE concept uses a method of bi-directional signal communication using AC power lines as a transmission channel. The audio signal is transmitted by superimposing high frequency signals over the AC power line. The components can communicate as soon as they are plugged into the mains, offering quite literally plug and play operation.

Marantz says the ZR6001 and ZC4001 have been specially designed for transmitting audio streaming data, providing real-time streaming of full CD-quality (44.1kHz/16-bit) audio. The company also says that because



the system works via existing AC power lines, there is no possibility of interference from other wireless systems such as WiFi, Bluetooth or even a microwave oven.

The ZC4001 is comprised of two loudspeakers, its own built-in amplifier as well as an RDS text display, clock, sleep and wake up timer.

Quite a clever and genuinely simple idea this one and Marantz seems pretty pleased with it as it has plans to add more products to the WEAVE family.

## Crystal clear

Standing an imposing eight feet high and hand fashioned from solid wood, this bit of kit would not look out of place on a plinth in the Tate Modern. However, it is in fact the Ballard sub-woofer from Crystal Audio.

Not by accident does the product look the way it does. It is the creation of sculptor Ilirian Shima and exemplifies Crystal Audio's raison d'être – which the company says is the bringing together of art and technology.

The Ballard is not on its own in this endeavour and it is in

*The very weird but equally wonderful Ballard sub-woofer from Crystal Audio*



fact part of the 'Sound of Art' family of loudspeakers from Crystal Audio. Ballard is designed to be used in conjunction with the company's Melody speakers which are from the same family.

The Ballard sub-woofer is a two-part construction built from exceptionally thick plywood, which is then treated with wax to deliver a striking finish. Crystal says the outer enclosure is totally inert and lacking in all resonance, thus creating an incredibly dynamic presentation.

Ilirian Shima crafted the lower element from more than 40 concentric circular wood segments. These were bonded together to create a multi-layered enclosure. Crystal claims the assembly affords excellent acoustic properties thanks to the inert nature of wood, while the lack of parallel surfaces completely removes standing waves.

The design has taken inspiration from the world of classic musical instruments and sits at an angle, thanks to an end-pin similar to that on a cello or double bass. This set-up means there is minimal energy transmission with the floor. It also means that the 30.5cm long-throw driver, powered by a 200W amplifier, is not parallel to the floor which means there is less reflection back onto the driver and therefore the design delivers a cleaner sound.

## Panasonic is proud of its 103" plasma

Panasonic's current favourite baby is its 103" plasma display panel (PDP) with full 1080p (progressive) HDTV resolution. Limited in actual customer numbers for these screens, the manufacturer's aim is more about grabbing attention and showcasing the company's latest technologies or achievements. Panasonic is particularly keen to point out the difficulties in maintaining stable discharge and high picture quality across the entire surface of a panel this size.

The company got around these problems by developing a new rib (which divides each gas cell and prevents interference between adjacent cells) as well as a new type of phosphor. Panasonic says the 103" 1080p plasma panel features consistent and uniform discharge, delivering the same accurate images from the centre to every corner of the screen, and the same brightness as the company's 50" HD model (TH-50PX500). The panel also incorporates Panasonic's 1080p HD high-speed pixel drive. The same high-speed pixel drive is used in the TH-65PX500 65" 1080p Plasma TV, which the company says have done well in Japan.



*Panasonic waves the company flag with a 103" HD plasma screen*

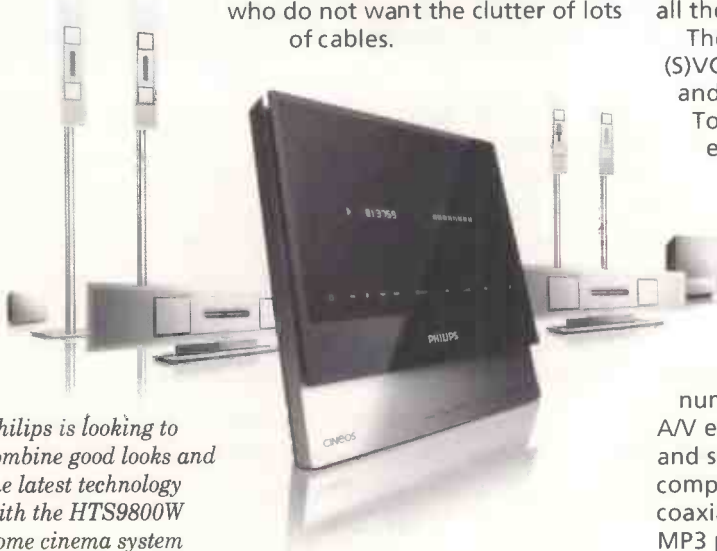
## Philips combines style with technology

Philips says its ultra-slim HTS9800W home cinema system combines contemporary styling with the very latest innovations. These include HDMI connectivity as well as 720p/1080i video up-scaling for near high definition video quality, multi-channel Super Audio CD playback and wireless rear speakers.

Philips says the system is one of the first to offer Dolby Digital EX 6.1 surround sound processing over a wireless rear speaker delivery system. The company hopes that its wireless solution will deliver on the technology front whilst placating those consumers who do not want the clutter of lots of cables.


The system comprises of the main DVD unit, three front speakers and three wireless rear speakers which are connected to a wireless receiver box and a subwoofer. Both the main unit and flat-panel speakers are afforded a sleek flat design produced to match the look of a flat panel LCD or Plasma. Both can be wall-mounted or placed freestanding. The unit has also been produced to deliver on Philip's promise to create high technology products that are instinctive and easy to use. To this end there are no unsightly bulbous buttons, but instead there is a touch-screen control with backlighting illuminating all the key functions.

The unit is compatible with DVD, DVD+-R/RW, (S)VCD, SACD, MPEG4, CD-R/RW, MP3, WMA/MP3-CD and JPEG CDs. The digital amplifier boasts an 800W Total RMS output across the 6.1 channels and is equipped with Dolby Digital EX, DTS and Dolby Pro Logic II decoders. The flat-panel speakers each utilise a ribbon tweeter with neodymium magnet assembly for sharp detail and smooth precision in the higher frequencies, while two 3" woofers cover the mid-band. The subwoofer is equipped with a 6.5" high-efficiency driver delivering deep low-frequency output down to 30Hz. Connectivity offers a number of ways to hook-up to a flat display and other A/V equipment. These include HDMI for digital pictures and sound, premium-quality progressive scan-enabled component video output, RGB SCART output and digital coaxial input for connecting audio devices such as CD or MP3 players.



*Philips is looking to combine good looks and the latest technology with the HTS9800W home cinema system*

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Basic but robust wall bracket for mounting LCD screens upto 30" in one fixed position.

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Close fitting yet has tilt and swivel fuctions.

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### Single Arm Universal LCD Bracket



Single Arm with tilt swivel movement

Display Size : 10"  
Max. display weight : 15kg  
VESA standard 75/100

Carriage Charged at £ 6.00 + vat

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Max. display weight : 15kg  
VESA standard 75/100

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**Order Code : LCDBKT11S**  
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### Universal LCD Small Plasma Bracket



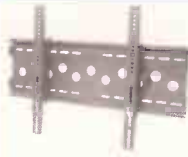
A versatile design thats ideal for Small Plasma and LCD's upto 32"

Display size : 20"-32" (50-82cm)  
Max. display weight : 40 Kg  
VESA standard : 75/100/200

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Tiltable : +15° / -15°  
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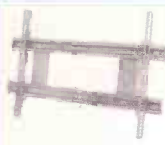
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This plasma bracket can be used with most plasma and LCDs, due to its universal mounting possibilities.

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Simple but very robust wall bracket for mounting Plasma big LCD televisions to the wall in one fixed position.

Display Size : 30"-50"  
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VESA standard : 50/75/100  
Distance between TV screen and wall: 2,5 cm

Carriage Charged at £ 6.00 + vat

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Length	Code	Price
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2 m 19 pin HDMI to 19 pin HDMI.....	HDMI2.....	£ 15.00 +
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5 m 19 pin HDMI to 19 pin HDMI.....	HDMI4.....	£ 20.00 +
7.5 m 19 pin HDMI to 19 pin HDMI .....	HDMI5.....	£ 25.00 +
10 m 19 pin HDMI to 19 pin HDMI .....	HDMI6.....	£ 30.00 +
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2 and 4 way HDMI Switch boxes

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Small, stylish design

Simple selection of RF channels with a digital Display

RF , Phono and Scart Inputs

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No scart break box required - comes with scart out

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## Mini AV Trasmmitter



Unique design allows out of sight installation

Connects directly to scart outlet of DVD, LCD TV, PLASMA TV...etc.

Also acts as an infred remote extender

Built in antenna

Come with scart locking connectors

Video Transmitter Operates upto 80m

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Suitable for Sony 1-554-762-51 and ITT 4112 2170

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BU 4508DX .....	£ 1.50 + vat	TDA 1541A .....	£ 6.00 + vat
LA 7845N .....	£ 1.00 + vat	TDA 3654 .....	£ 3.50 + vat
MC 44608P40 .....	£ 2.50 + vat	TDA 3654Q .....	£ 3.50 + vat
MC 44608P75 .....	£ 2.50 + vat	TDA 7293V .....	£ 5.50 + vat
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# Plasma on parade

Plasma continues to hold its own despite pressure from competing technologies. *Television* takes a look at the big picture



**T**here is no doubt that plasma is now experiencing more pressure as LCD continues to improve its large-screen performance in terms of picture and cost. However, plasma still has many fans, particularly in the home cinema sector. Plasma has also managed to grow its sales, taking particular advantage of the growth in the 50" and above category. Samsung puts the increase at 36% in the UK in terms of market value year-on-year since May 2005.

Martin Bischoff, senior applications engineer for display products at panel manufacturer Fujitsu, Hitachi Plasma Display Ltd (FHP) sums up: "As LCD has achieved larger display sizes it has become a competitor technology to PDPs. Some time ago there were clear boundaries between both technologies in terms of size. It was not efficient to go over a certain size for one technology, while for the other it was not possible to produce below a certain size.

"It is important to remember that the technologies cannot be compared directly. TFT LCD uses indirect light, controlled by light valves, passing through colour filters to create a picture

– comparable to a direct view display system for film positives.

"PDP uses direct emission, as colours are reproduced by phosphors as with CRT. Thus each technology produces a completely different experience for the human eye."

These inherent differences mean that plasma produces a set of performance characteristics that will continue to attract a fan base. Peter Johnson, technical sales manager, Hitachi says: "Plasma has certain qualities that make it better for large screen viewing than LCD. With LCD, the backlights are always on which means that any black content can look grey or blue because of light 'bleeding' through the LCD structure. This is particularly noticeable when watching at lower room light levels.

"The other major issue is response time. Plasma panels react much faster than LCD and this means that you will not see the blurring that is evident on fast moving content viewed on LCD screens. This becomes even more important with HD content."

Dominic Feeney, Pioneer product executive, backs up this view: "Whilst LCD screens are available more and

more in sizes over 30", plasma has distinct benefits over LCD in the large screen category. Plasma is known at these sizes to have a wider viewing angle and better colour reproduction.

"In contrast to LCD's the image quality of a plasma gets better and better the darker the room – the ideal environment for the home cinema experience. Plasma screens are also much more cost effective at this size."

## Technological advances

Inherent advantages argued for by manufacturers are one thing, but no technology can survive unless it is improved upon and the performance envelope is consistently pushed. Most of the manufacturers have been trying to add extras to give themselves a technological edge. Steve Lucas, product specialist, Panasonic UK, says that energy consumption has been reduced (by around 26%) as has heat production (resulting in the introduction of fan-less panels) and a reduction (35%) in the amount of glass used in the panels has been introduced on Panasonic plasmas.

Dominic Feeney of Pioneer describes his company's latest advances: "Recent

Israeli forces enter Lebanon at night – live pictures (W1)



Test card from conflict area (W1)



Unknown PM5544 test card (W1)



Eutelsat W1 ; 'SAVANA-7' often sighted in the early stages of war disappeared – as did three 'ISOL' feeds – both were using W1. An 'ABC IRAQ MOBILE' SNG unit signed as UKI-690 which may have been a hired-in flyaway terminal. The mysterious 'EIIIEAMOBFBFS' that also was seen over AB-1 using BBC parameters was never identified.

August 10 was the day that the UK airports ground to a halt when security forces arrested a large number of people in connection with suspected planned attacks on air-liners. Early AM and 'BSKYB-LONDON' and later 'SKY NEWS LONDON SIS CREW – SKY NEWS UKI-588' were entrenched outside Heathrow taking pictures of stationary traffic. As usual Sky remain loyal to Eutelsat W2,

16° East and were found @ 12.550GHz-Horizontal (5632+3/4) moving to 12.555GHz-H (2816+3/4) later in the day. The Israeli satellite facility R-R-Sat' also appeared over W2, 12.519GHz-H (5632+3/4) at the same time with live war footage from Northern Israel.

Sports enthusiasts are well advised to check out PAS-12, 45° East Saturday afternoons through the autumn for rugby football from South Africa. The ABSA Currie Cup is being fought out from late summer onwards and can usually be found on or around 11.517GHz-V (6109+3/4). Late July the Sharks v. Cheetahs game was being played at the Durban Stadium – the Cheetahs won! The Michigan International Speedway is the spot for racing action. The 'Indy Series

2000' appeared over NSS-7, 21 1/2° West over the normal 'BTNA WASHINGTON' slot –11.670GHz-H (5632+3/4). Roy Carman (Dorking) notes that the NBA basketball feeder has resumed back on the 11.609GHz-V slot on Intelsat 907 @ 27 1/2° West with the commonly used SR5632+FEC3/4 parameters.

Unfortunately the PGA golfing tournaments are now often encrypted but AB-1 recently were carrying footage in the clear – 11.010GHz-H (1333+3/4). On the day that the Open Golf Championship at Hoylake was played, a 3 channel bouquet was operational – two encrypted but a 3rd was in the clear, not unlike the old GLOBECAST 3 channel bouquet which often carried PGA golfing action up to a few months ago.

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# Amazon enters the download jungle

Just ahead of its  
launch date in  
August, Rethink  
Research Associates  
(the body dedicated to  
helping the industry  
develop successful  
digital strategies) took  
a look at the implica-  
tions of Amazon's  
entry into the video  
download sector

**A**mazon's service, with its own freely downloadable PC software, similar to iTunes or Sony's Connect service, will join other recently launched services including Starz Vongo, iTunes, as well as services from Google, Sony, Clear Channel, 4Flix.Net and Blinkx. Arvato, LoveFilm and NTL have all launched services in Europe, and DirecTV has announced it will have a service by year end.

With the exception of Apple, none of these services has made much of an impact and have yet to issue any details on how well their services are going.

Apple sells H.264 (MPEG-4) compressed video requiring 750kbps for video, plus 128kbps for sound, aimed at PC and iPod viewing. These are fine for viewing in that way, but a little too low quality for showing on a large TV screen. We expect Amazon to do a better job than this, perhaps targeting a 50% improvement in density, but as yet no details have slipped out about how such films will find their way onto a TV screen, if indeed they will. All services that offer downloads to view only on a PC have drastically limited their appeal, with one survey last year

suggesting that only 1 in 4 people were happy to watch movies on PCs. Amazon certainly has some cards up its sleeve that can address this weakness. Back in July Amazon bought CustomFlix, a service that holds films on a central server, and which can write them to a DVD after an online order is received and mail them out. The main focus of services like this is to offer films that there is some demand for, but not enough to warrant paying for another manufacturing run for a DVD. Interestingly on the Amazon Internet Movie database (<http://www.imdb.com>) within the top ten films in the view of Amazon voters, only 1 or 2 are still in DVD issue. Out of its top 250 films Amazon probably only has less than 10% in stock as DVDs at any given time. If it leverages from this Internet Movie Database (IMDB) service, Amazon could be in a great position to offer combinations of download plus a DVD burned and posted subsequently. However, there is a danger here that Amazon will build its service in such a way that it is more about augmenting its existing DVD sales and less about replacing them.



## Moving ahead

Universal Studios is known to be licensing online services such as Wippit and LoveFilm in the UK, with a super expensive service that automatically gives you two files now, one for a PC and one for a portable player and then puts the DVD in the post. Amazon must avoid that kind of limitation on its service or it will be stillborn. In our view Amazon is one of the last few brands that has a chance of challenging iTunes on film video distribution. Recently Amazon's CustomFlix added Blu-ray and Microsoft formats to its already licensed HD-DVD format for film files to be written in.

Another danger here is that Amazon's service uses a Data Reference Model that allows files to be written to the DVD where the DVD can be tied to the PC that it is burned on, or other tethered devices. This wouldn't get Amazon around the problem of shifting the film to the TV set. CustomFlix already has content deals with NBC Universal, A&E Home Video, and the PBS (Public Broadcasting Service), so it would seem likely that these same firms will appear on Amazon's actual video download deal, perhaps with one or two others.

Back in March the rumors about which studios Amazon was in talks with included Paramount, Universal and Warner Brothers, with Sony, Disney and Fox being less successfully courted. ABC is reported to have said categorically that it has no deal with Amazon, nor is it close to one. This may be due to its loyalty to the Apple brand, which was first to push ABC TV series for download last year.

One of the nice things about Apple and Amazon doing an online film deal is that they are both used to putting in the licensing effort to take their services global. Almost every film download site that has been launched has been

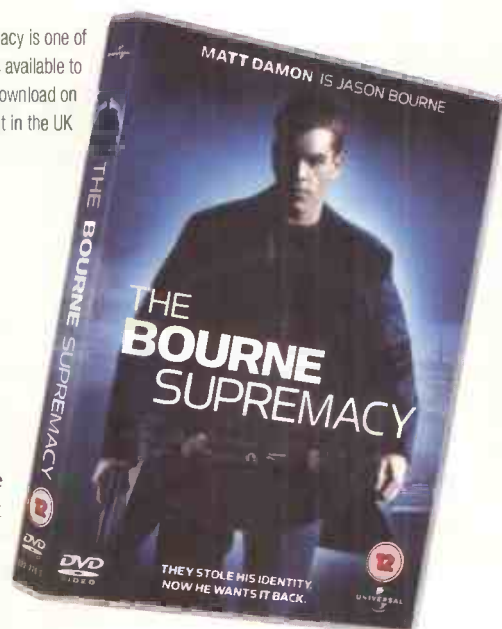
limited to distribution in the US or in one other country.

The issues of international film distribution are far worse than music only. One reason is that films must also get permission for distribution from every piece of music that is used in the film as well as from the multiple layers of the talent that went towards creating the film. Those commenting on the Amazon deal have said little about detail so far, except that the film service will work alongside DVD sales and that programs will include TV series as well as films, and that all of its content will be advertising free. They have not even specifically stated whether it will be a rental or download to own service, or subscription, and one report suggests that it will be all three. The service is referred to internally as Amazon Digital Video and leaks suggest that originally it was to be as much a music service as a film service, but the music side was dropped because of Apple's stranglehold on that market. In the long run Amazon is almost certain to fall into the trap of using the service to drive its core entertainment sales on music CDs and DVDs. In their existing format this represents some \$3 billion of revenue for Amazon, and really it could be launching into this market for all the wrong reasons – trying to protect the revenue it has, rather than open a brand new, even larger business segment.

## The winner takes it all

The winner in the film download market will be the company that makes it easiest to buy content and enjoy the process. It is essential that a PC based application, not a web site, is the front end and that it allows samples, downloads in the background, recommendation lists, and plenty of information on films generally. The winner will not be one that keeps saying

The Bourne Supremacy is one of the first films available to download on Wippit in the UK



“would you like a DVD emailed to you” all the time. Once both Amazon and Apple have launched into the film download market, there is likely to be an immediate rush for cover and some sector consolidation. It is likely that many of the new services launched this year won't last 12 months, as long as the basic mistakes we have pointed out are avoided. If Amazon doesn't avoid those mistakes, then it could deliberately hamper sales by offering a business model where online downloads are more expensive than DVD purchases, which would neither make sense, nor work effectively, because it just wouldn't be competitive. Amazon could, of course, decide to only allow file downloads of titles that are currently not worth stocking as DVDs, which would also make this a weak service. We doubt it will do anything other than come out with a solid execution on a business that will effectively end up one day replacing one of its biggest money spinners. After all, DVD sales have flattened, leaving even Amazon looking for its next round of revenue growth. Rethink Research can be contacted at [info@rethinkresearch.biz](mailto:info@rethinkresearch.biz) or on +44 (0)207 407 9848.

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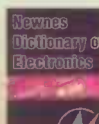
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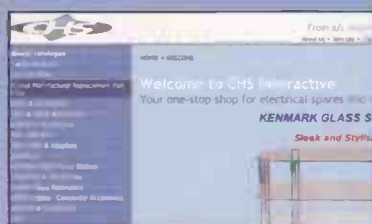
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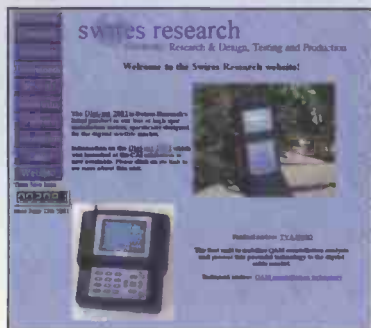


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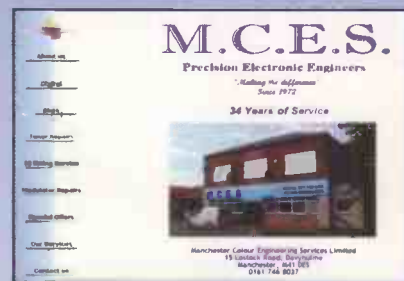
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Displays checksum after all relevant functions

## • OPTIMISED FOR IN-CIRCUIT PROGRAMMING

An LED is lit when correctly connected

Can program selected devices on the same bus

Automatically caters for different Vccs

Extensive protection against wrong connection

Master data can be downloaded from a file or another device

## • OPTIMISED FOR FIELD SERVICE

Self-test facility to save time in case of a suspected fault

As the programmer contains no firmware, updates for new devices or facilities can be distributed by simply updating the PC program

Data can be read from a device and stored in a file

The device type can be automatically indicated from the data file

Easy-to-use file viewer with edit facility



## SPECIFICATIONS

### PHYSICAL

Dimensions: 115 x 75 x 35mm

Weight: 125g

### ACCESSORIES

USB lead

In-circuit programming lead

8-pin DIL clip

8-pin SO clip

CD-ROM

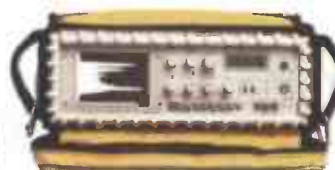
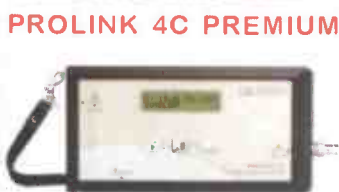
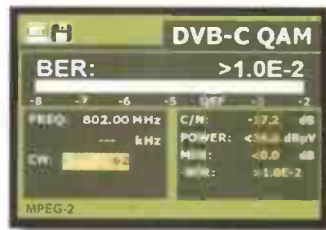
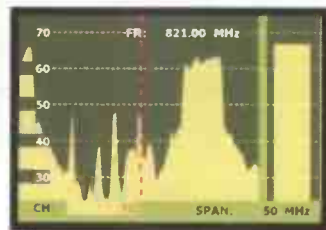
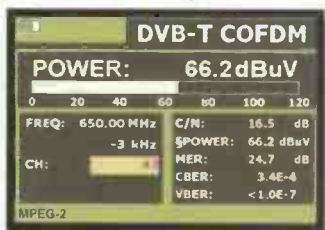
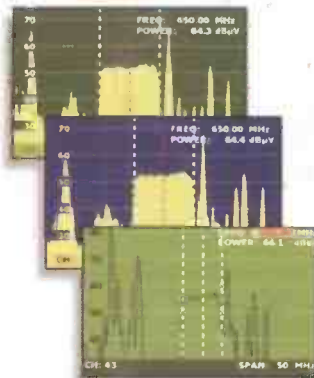
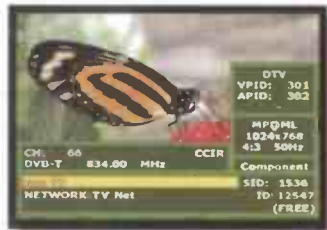
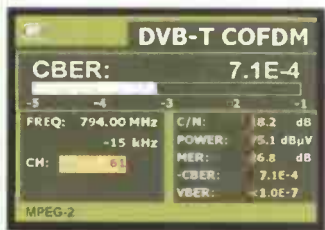
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# WHAT BETTER CHOICE ?

FOR QUALITY, PERFORMANCE & AFTER SALES SERVICE



PRODIG 1+

PRODIG 2

MC 577



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SALES + SERVICE + CALIBRATION