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JANUARY 2007

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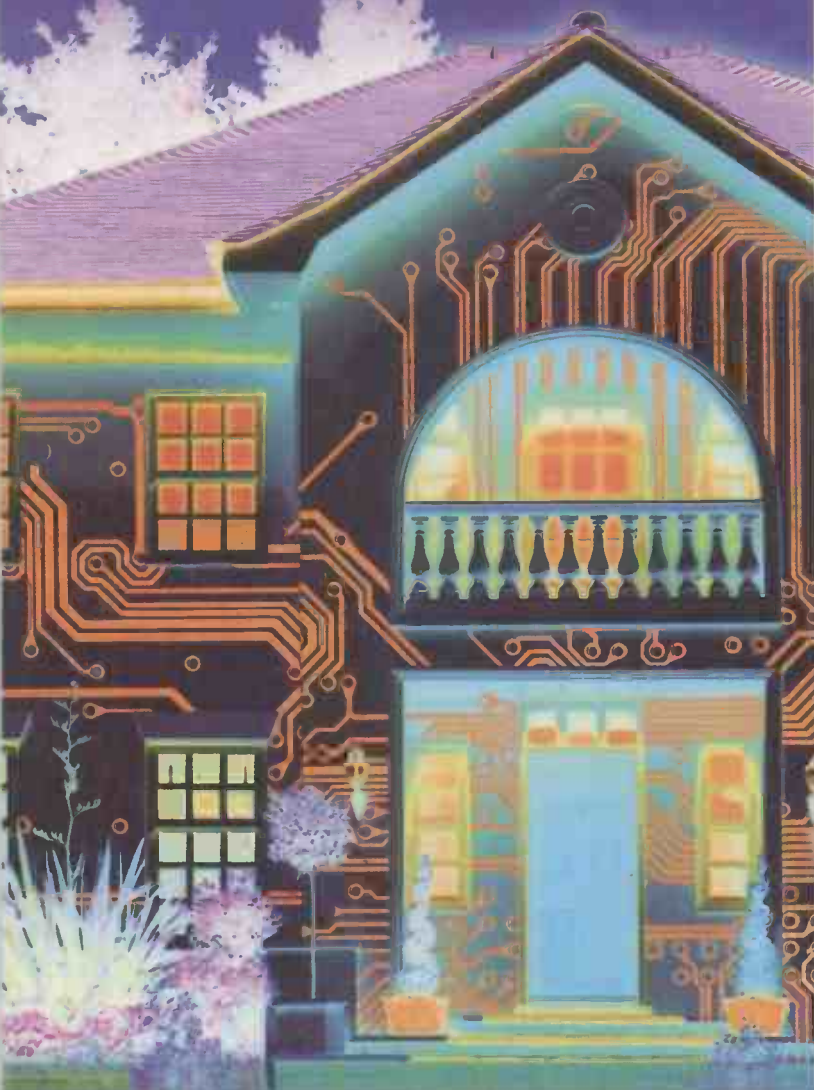
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# TELEVISION

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

## Newstrade Enquires

by Seymour Distribution Ltd., 86 Newman St, London, W1T 3EX.

ISSN 0032-647X

## Newstrade Hotline

If you are experiencing problems getting copies through your newsagent, please call Debbie Jenner on 01322 611210.

## SUBSCRIPTIONS

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Mainland Europe: 1 year €95.00  
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2 and 3 year subscription deals are available, please call 0870 4287950  
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## NET PROFIT

Recently Television was invited to attend a conference hosted by media consulting and research company IDATE. The purpose of the event was to examine how TV content and its delivery will change in the future, and in particular the role of the Internet. Opinions varied as to how exactly change would occur. But one thing was obvious, big changes are on the way and they could be to the advantage of the service and repair community.

There are many buzz words flying around concerning the forces that are shaping the content people want to watch. Many people now refer to a new era of hyper-personalisation or ego-casting as having arrived. These terms are used to describe the growing phenomenon of people using the Internet to either watch or post home made video content. The dominant portal in this space is youtube (recently bought by Internet colossus Google for £883 million) which has five million different videos to choose from.

However, Internet based content will not be the preserve of American teenagers filming themselves skateboarding off a roof for long. Serious corporate brands are becoming interested in launching Internet offerings because of the huge potential for revenue. At a time when traditional broadcast advertising revenues are under pressure, the potential for extra income the Internet provides for brands like MTV, will be irresistible. Imagine a music channel where viewers don't just watch videos, but can download and keep content as well as buy CDs, books, DVDs or pay-TV events, all in one seamless viewing experience. This type of model could be applied to any specialist brand. SonyBMG has already launched a site which holds content on all its artists as well as providing new and unique opportunities to advertisers. Welcome to the very real world of Internet Protocol TV (IPTV). There is some way to go before the seamless interactive experience is realised, but it is on the way. In the UK Channel 4 has already started streaming much of its content on the Internet in simulcast with traditional platforms. The opportunities this new media offers can hardly have been missed by the BBC, a genuine enthusiast for new broadcast streams or ITV, which is feeling the pinch from dropping advertising revenue.

Many had predicted that IPTV would usher in a new anarchic age of TV with control handed back to ordinary people producing and watching their own content. There will be some room for this, but the serious broadcast companies are now interested and the content of IPTV will not be dominated by plucky independents, but by large corporate brands and experienced broadcast franchises. Take a look at today's popular music charts. File sharing and downloading music has enabled some independent outfits to thrive free from the shackles of the corporate machine. But the music charts are still dominated by groomed, corporate financed acts. If anything IPTV will increase the power and ability of the big media companies to target audiences.

## What does all this mean for engineers?

Opinions differ on precisely the best way to deliver these new types of content. However, all current research suggests that people would rather this new type of enhanced content was delivered via their TV not a computer screen. Therefore a new generation of complex set-top-boxes, media centres and TVs with integrated hard-drives and complex decoding solutions will be required. More on-board electronics increases the probability that things will go wrong. Hard drives will jam, software will crash, all points where the expert can step in. True there will be much to learn, particularly getting



The Internet will soon change forever the physical make up of TVs and consumer electronics

used to a more software based approach when things do go wrong. But what industry that deals with service and repair has ever stayed the same forever? These developments must be grasped with both hands if their potential benefit to the independent is to be realised.

**Daniel J Sait**  
Editor

# Panasonic bans lead TVs

Panasonic says it has become the first company in the world to achieve the elimination of lead in all its Plasma Display Panels (PDPs). Non-use of lead for display panels began with Panasonic's Spring 2006 line-up and has now been expanded to cover all Plasma TVs.



Traditionally, lead oxide glass is a key component when manufacturing PDPs. The lead in the glass helps to maintain stable production and quality by optimising the softening points of the other materials. However, Panasonic has developed a new glass material with similar properties to lead oxide glass. The heating conditions of each process in PDP manufacture have also been optimised to ensure stability without the use of lead.

In addition to the elimination of lead, Panasonic has assessed its PDP range to find new ways to make it more energy efficient and environmentally friendly. The latest range of VIERA PDPs have had their overall weight reduced by 20% per cent and their number of components by 30% when compared to previous models.

Panasonic is the first manufacturer to banish all lead from its plasma TVs

Panasonic has also looked further than just the products and introduced a number of environmentally aware initiatives in its manufacturing process. At the Amagasaki plant in Japan, improvements have been made to the manufacturing process resulting in a reduction of 48% of CO<sub>2</sub> emissions per plasma screen. The plant itself is partially powered using natural energy sources including solar and wind turbines.

# IDTV development



The TVonics DVB-T module is designed to speed the development of IDTV

Digital television design house TVonics has developed a new module design targeted at terrestrial IDTV applications. Using one of Toshiba's digital video broadcast (DVB) system-on-chip (SoC) processors, the TVonics DVB-T module will provide OEMs with a straight forward way to add IDTV functionality to existing and new televisions. Providing single-stream MPEG-2 decoding, the platform combines Toshiba's Donau TC90403FG multimedia SoC with a tuner and COFDM demodulator, Flash and DDR memory, common interface, and a variety of other functions required to implement a complete DVB-T solution.

The TC90403FG Donau SoC at the heart of the TVonics platform, brings together Toshiba's Media embedded Processor (MeP) architecture with a powerful 64-bit embedded RISC host. The MeP architecture effectively frees the host processor from compute-intensive DVB and multimedia processing tasks by providing MPEG video decoding; three-stream audio processing to AAC, MPEG and AC-3 standards; audio post-processing including surround-sound and EQ functions; and a powerful multi-plane graphics engine with hardware accelerator.

# RadioScape pushes for more co-operation

John Hall, CEO of digital radio solution's specialist RadioScape, has called for closer co-operation between industry players to more aggressively address the factors that will make digital radio a 'must have' consumer item. Speaking at an event to mark the company's 10th anniversary Mr Hall said: "Today we are not just celebrating RadioScape's 10th anniversary, but also the significant achievements the digital radio industry has made during this period.

"We can now see that DAB digital radio can truly become a mass market consumer proposition as more countries adopt the standard. In the UK, the industry has worked hard to

drive the entry level price point for digital radio down below £29 at retail, to bring over 400 DAB radio services on air and to ensure that DAB has broad population coverage at over 85%."

However, Mr Hall added: "Even with hundreds of DAB radio products now available and the strongest ever consumer awareness at over 65% of the population, DAB digital radio sales still only make up around 20% of all radios sold at retail. As an

industry, we have to accept that digital radio still lacks the 'must have' factor for certain demographics, and do something about it." In particular, Mr Hall identified that compelling content available on DAB-only channels would now be the most significant factor in increasing audience size.

RadioScape believes that more emphasis on digital-only radio content is needed





## Digital TV kit sales overtake analogue

Sales of digital television equipment have overtaken analogue for the first time. The findings from Digital UK, the independent organisation leading the nationwide switch to digital TV, show that in the three months to September 06, combined sales of digital televisions, set-top-boxes (STBs) and recorders accounted for 51% of all television equipment sold.

Digital UK says the research, based on sales in 20,000 UK stores and carried out by retailer analyst GfK, reveals the continuing surge in high-street demand for flat panel televisions – the majority of which are switchover ready – and a

sharp decline in sales of cathode ray tube sets. Sales of flat TVs grew by 83% over the quarter while CRT sales fell by 40%.

Ford Ennals, CEO of Digital UK, said: "This is a landmark

Digital UK says the switch to digital is gathering pace



moment in the UK's transition to digital television. People love the extra channels and services that digital offers and the new generation of flat televisions on which to enjoy them."

The news was tempered by the fact that analogue TV sales still outstrip integrated digital. During the survey period analogue stood at 935,000, while integrated digital accounted for 531,000. This represents a split of six to ten in analogue's favour. However, Mr Ennals of Digital UK remained upbeat about the news, he said: "While some shoppers continue to buy analogue televisions, they can be easily converted to digital as

switchover approaches. We will continue to work closely with manufacturers and retailers to phase out the sale of analogue sets and ensure people understand the benefits of buying switchover-ready products."

Laurence Harrison, director of consumer electronics at intellect, the trade body for the UK's high tech industry, said: "These statistics clearly demonstrate consumers' appetite for digital TV products. We fully expect this trend to accelerate further and are working closely with manufacturers and retailers to support the continued transition from analogue to digital products in the run up to switchover."

## Funai increases UK footprint

Japanese manufacturer Funai is looking to expand its penetration of the UK market by adding more LCD TVs and deck-based disc products to its range. The company's line-up already includes LCD TVs, VCRs and DVD/VCR Combis, available to independents and multiples.

Founded in the sixties in Japan, the brand has had success supplying large retailers in the USA like Walmart and Sears and Roebuck. However, now the company wants to increase its European sales.

Ann Tai of Funai's UK team, said "We can offer excellent quality products to the trade and have efficient logistics and sales support programmes in place. We are investing considerably in the UK market and look to gain a strong foothold in the LCD and deck markets."

The company has

launched a website dedicated to its UK operations and this year will introduce in-store product training and a media awareness campaign.

Funai says it believes in full control to ensure quality, so wherever possible the company's manufacturing plants build every component required to create the finished product. Funai believes through producing and understanding the most basic components, it has gone on to develop superior circuit design and mechatronics technology.

The LCD-B2706 TV will be one of the key products for 2007. This set includes progressive scan, adjustable dynamic colour enhancement and a contrast ratio of 1000:1. The company also has its own image enhancement technology called Clear Pix Engine. The



ABI believes many more products will be W-Fi enabled like Microsoft's Zune

engine processes all video signals including the external analogue input to produce a natural, sharper and clearer image and make edges sharper and clearer. Colour management, where each colour is improved independently to reproduce a natural live colour, is also included as is digital noise reduction.

Funai says sound is

delivered from two 5W internal speakers positioned either side of the screen with built in digital noise reduction. This is designed to ensure good clarity by removing any interference from the sound delivery.

Connections include 2 x Scart Sockets, DVI, S-Video in, PC Audio in, RGB in, Subwoofer out and headphone in.

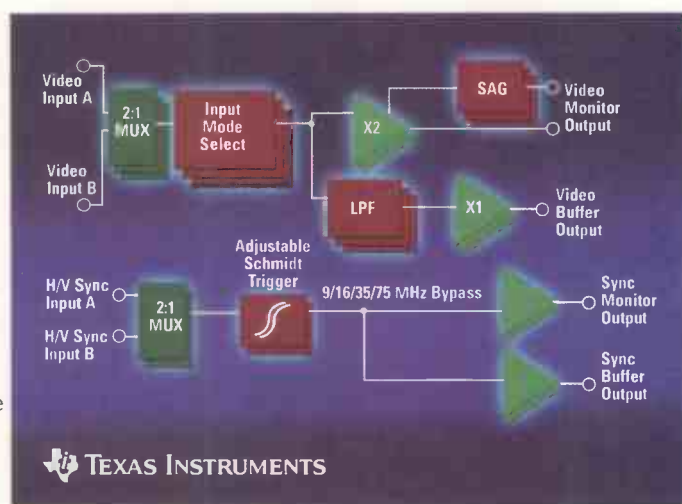
## Integrated video amplification

Texas Instruments (TI) has introduced the first video amplifier with integrated filters which is capable of handling both analogue RGB signals and digital horizontal and vertical (HV) sync signals on a single chip. TI says the THS7327 saves up to 80% board space when compared to traditional amplifier solutions for video projectors, professional video, broadcast video, computer display, traditional and digital TV systems. The company argues designers will benefit from improved performance and maximum flexibility via I<sup>2</sup>C programmability of all functions including; integrated two-to-one input multiplexers to enable switching of multiple video sources; fifth-order antialiasing filters to enable use with multiple video standards; and input bias modes including DC, DC plus level shift, AC and AC sync

tip clamp to enable interfacing to multiple video sources.

The THS7327 integrates three analogue video channels and two digital channels for HV sync, simplifying system design and reducing component count. The three analogue channels incorporate unity gain buffering and monitor feed-through paths to handle all standard video formats, including RGB, YPbPr and CVBS. The programmable filters and input bias modes provide all the common analogue signal conditioning requirements for implementation of the following standards, while eliminating the need for more than 20 external components.

- 9MHz filter for SDTV video including CVBS, S-Video and 480i/576i.
- 16MHz filter for EDTV 480p/576p and VGA signals.
- 35MHz filter for HDTV 720p/1080i and SVGA signals.



TI has simplified video amplification with the THS7327

Each analogue channel with an integrated

programmable filter, provides a unity gain buffer for input into a video decoder or video analogue-to-digital converter, and a separate path without a filter for monitor pass-through. The monitor pass-through includes a 6dB gain output buffer with SAG correction capability, bandwidth of 500MHz and slew rate of 1300-V/ $\mu$ s.

## UK consumers won't pay for web TV

A UK survey has concluded that consumers are not prepared to pay for downloading audio/visual content via a PC.

Carried out by the law firm Olswang, which specialises in technology issues, the Convergence Consumer Survey 2006 revealed that rights holders and service providers are facing challenges in the battle for control of the living room. In the digital age, consumers want choice and control, but



A fight is brewing for the control of living room entertainment

for providers the biggest hurdle is to overcome consumers' unwillingness to pay for content.

Consumers are now demonstrating a clear preference for full-length feature films and TV programmes over shorter clips as their content of choice for the PC. Nearly 40% of UK consumers are already streaming or downloading audio-visual content onto

computers and nearly half of these are doing so in the living room. Whilst this suggests a lucrative new market for rights holders and service providers, the downside is

that 1 in 2 consumers were not prepared to pay anything extra for streamed/downloaded content and a further 40% were not willing to pay more than £5 per month.

The survey of 1,500 13-55 year old UK consumers discovered that, although home computers are used in the study or bedroom as a replacement television set, 49% of those consumers who are watching downloaded

content are doing so on a computer in the living room. The study concluded that in order to engage in the battle for dominance of the living room, content providers and manufacturers need to take account of this behaviour by providing ways to get content from the Internet direct to the TV or transfer it from a PC to the TV.

This is underlined by the fact that consumers appear to be attracted to the choice of content and viewing times offered by video on demand (VOD) services, such as those already provided by ntl/Telewest and Homechoice and BT. 38% of consumers, on top of the 12% who are already receiving VOD, stated they are interested in receiving VOD on their television sets.



## Fujitsu announces the Aviamo brand

Fujitsu General UK, has announced plans to launch a new range of full HD 1080p capable digital TVs. Branded AVIAMO, the new range includes two plasma TVs – 50" and 65" models and a 37" LCD TV (the company's first LCD). The AVIAMO range also sees the debut of the third generation of Fujitsu's video processing technology – AVM III – which has been enhanced and fine-tuned for 1080p scaling, processing and display. The AVIAMO range is available from this January and all three AVIAMO TVs boast a 1920 x 1080 resolution display, include two HDMI digital connectors and an array of input connections, as well as a digital TV tuner with electronic programme guide for standard digital TV broadcasts. Fujitsu says, powered by the advanced

processing capabilities of the all-new AVM III video processor, the AVIAMO range is capable of capturing and faithfully reproducing every pixel in 1080p HD material. The units also up-scale standard definition and HD sources such as 720p, as well as processing the 1080i format to the full HD 1920 x 1080 resolution.

Fujitsu says AVM III adds full 1080p processing to the proven interlacing and scaling capabilities of the original AVM II video processor and adds a number of new enhancements including -

- Advanced colour management – including a new menu selection which allows for gamma adjustment, ultimately improving the grey scale performance by targeting specific areas within the grey scale.

- 24p/30p film mode – complementing Fujitsu's video mode application, this approach allows for an increase in motion smoothness for all film based material with 24p/30p film mode detection.

- Contour correction – enhanced tracking of contours on images to further reduce jagged edges.

All three TVs feature a sleek black piano gloss frame and integrated stand complete with B&W stereo speakers. The 37" model comes complete

with the integrated stand while it is optional on the 50" and 65" models to allow for wall-mounting. Mark Anderson, UK operations manager, Fujitsu, commented: "With HD-DVD and Blu-ray players already on the market and the Playstation 3 due early next year, we felt now was the right time to bring our full 1080p products to the market."



The Aviamo range is Fujitsu's new high-quality consumer brand

## Luminus Devices introduces Phlatlight PT120 chipset

Luminus Devices, Inc. has announced that its PhlatLight PT120 chipset is being sampled to its micro-display projection television customers. The company says the red, green and blue LEDs in the PT120 chipset combine to produce more than 1,500 white lumens under normal operating

conditions, enough brightness to illuminate rear projection TVs up to 62" with a single RGB chipset.

Luminus says the PT120 chipset is suitable for any micro-display smaller than 0.7", but was specifically optimised for use with the Texas Instruments xHD5 1080p

collected and projected onto the screen.

The PhlatLight PT120 is a three-colour system that includes a red, green and blue LED. Each LED is a single, large area monolithic chip that can sustain high power and fast pulsing.

"Because PhlatLight LEDs are a solid state light source, the colours can be cycled at high rates," said Christian Hoepfner, vice president of products at Luminus.

He added: "In a DLP HDTV system the red, green and blue PhlatLight LEDs can cycle at 2.9 KHz, which is 48 times faster than traditional

television frame rates, providing superior motion quality."

The company says another benefit of PhlatLight technology is that it has significantly longer lifetimes than arc lamps. Luminus claims that with a lifetime that exceeds 60,000 hours, PhlatLight chipsets will never have to be replaced.

The PhlatLight PT120 chipset is currently being designed into a number of DLP HDTVs that use the xHD5 DLP chip, with screen sizes as large as 62". Several models from various manufacturers will be commercially available in 2007.

PhlatLight technology is designed to deliver superior motion quality



DLP chipset. The size and shape of the PT120 is designed to maximise the amount of light that can be

## Sony banishes 'screen door' effect

Originally developed for professional cinema projection, Sony's SXR D (Silicon Xtal Reflective Display) is billed as setting new standards for its home projectors and micro device projection TVs.

Sony says that what makes Sony SXR D so special, is its radical design where the silicon backplane contains the driving circuitry that controls the liquid crystal matrix. The company says normally this would be routed between the pixels, creating a grid pattern which is visible as the infamous 'screen door' effect in the image itself. Without this grid of control circuitry, the tiny 7µm (micrometre) pixels can be very close together – just 0.35µm apart. The result is claimed to be a picture of unparalleled cinematic-style smoothness and detail.

Sony says an exceedingly quick response time of 2.5µs yields a crisp, fast moving image, which is why Sony SXR D is said to be ideal for handling high-speed movie and sports action with complete fidelity.

Sony's SXR D full HD (1080p) home theatre projectors and micro display projection BRAVIA TVs use RGB spectrum-splitting and a triple panel array to create the final image. Sony claims this 'one panel per colour' approach yields excellent high-precision colour reproduction with absolutely no colour breaking.

SXR D is the technology behind selected Sony full HD



(1080p) home theatre projectors and BRAVIA full HD (1080p) micro display projection TVs. These include the QUALIA 004 and EISA Award winning VPL-VW100 projectors and the 55" BRAVIA A-Series TV. The range of Sony SXR D products is growing further with the recent introduction of the VPL-VW50 projector and the 70" BRAVIA R-Series TV.

## Sharp introduces new DVB-S2 tuners

Sharp has introduced two new DVB-S2 tuner modules to the European market. The BS2F7VZ0164 and BS2F7VZ0165 are fully equipped Network-Integrated-Modules (NIM), integrating a complete HDTV RF front-end and demodulator circuitry. With this two-in-one solution Sharp is offering tuner modules that combine a front-end for both, 8PSK and QPSK detection to receive HDTV and SDTV broadcast signals. The Integrated demodulator IC provides an 8-bit digital data-stream for further processing. Sharp says this will spare hardware developers a lot of time, since high frequency developments and optimisation of demodulator circuits usually requires a lot of resources. In consequence, the new DVB-S2 NIM tuners will help Sharp's partners to cut down time-to-market cycles and gain a competitive advantage.

The DVB-S2 tuners with demodulator (NIM) cover a typical frequency range of 950 to 2150MHz for satellite TV transmission and are suitable for receiving both HDTV (DVB-S2) and SDTV (DVB-S) signals. There are two choices of demodulators from two co-operation partners: the Conexant CX24116 and the ST Microelectronics STB0899. These two options allow the system integrator and development engineer to be in position to develop a satellite receiver system for two different backend solutions.

## First HD broadcast from space

NASA has made the first ever high definition (HD) TV broadcast from space in a collaboration with the Japanese Aerospace Exploration Agency and the Discovery HD theatre channel.

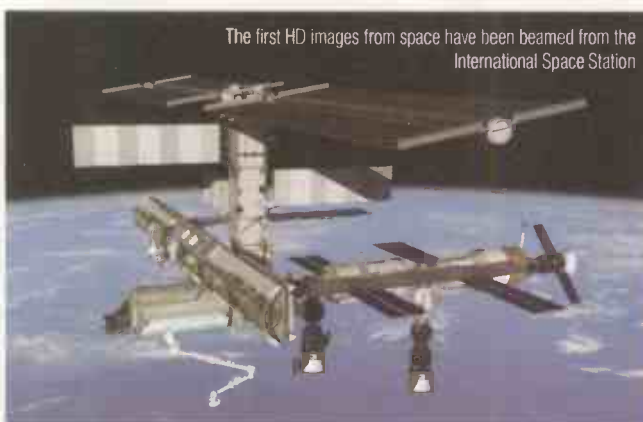
The two live broadcasts went out at the end of last year with astronaut Thomas Reiter acting as cameraman. The footage was streamed live back to earth using the so-called Space Video Gateway. The kit needed for the broadcasts, including a camcorder, viewfinder and lenses was installed during the last visit the space shuttle Atlantis made to the International Space Station. That mission also transported cabling, an HDTV signal

decoder, processor and hard-drive to the crew of the space station.

Although high definition footage has been filmed aboard the station before, the recordings had to be physically retrieved before being checked and broadcast.

This was the first time HD images have been streamed live from the station.

NASA says that HD footage of life aboard the space station will not just be interesting to the public, but useful for scientists and engineers.





## Pure Digital Marshall joins its forces

Pure Digital has released details of the eye catching Pure Evoke-1XT Marshall Edition DAB digital radio. The radio looks to combine the EVOKE-1 XT radio with the legendary style of Marshall Amplification to deliver the ultimate in rock radio.

The radio was created in collaboration between PURE, Marshall Amplification and digital radio station Planet Rock.

The EVOKE-1XT Marshall Edition is wrapped in black vinyl, just like a Marshall amp, with solid wood construction, brass-effect control panel and a black metallic speaker grille. The fierce red on black display features adjustable brightness and of course the volume dial goes up to 11.

Says Victoria Marshall, managing director of Marshall Amplification: "We're excited to bring the Marshall brand to this fast growing segment of consumer electronics. "Working with PURE, we've created a DAB digital radio that brings iconic Marshall design to a product that all radio listeners can embrace as a stylish statement of their



The Volume level on the EVOKE-1XT Marshall goes all the way to 11

love for music."

For max sound quality the product has an integrated full range hi-fi speaker and features a bass reflex port for enhanced bass performance alongside a custom designed 3" drive unit and active-filters to provide a natural 'direct-from-the-studio' sound.

A USB connector allows product updates to be loaded from the Internet so the radio can be kept up to date with any software changes. The unit can be upgraded to stereo with the optional XT-1 add-on matching speaker.

## iplayer delivers advanced TV decoding

Evesham Technology has launched the iplayer, a High Definition (HD) media centre that combines a digital TV receiver, real-time HD up-scaler, time-shifting digital TV recorder, network media centre, Internet browser and download station into one box.

Evesham says the iplayer is a compact and refined digital HD, SD and IPTV receiver and with the inclusion of an HDMI output, the unit can deliver the highest quality TV pictures.

The iplayer can access all the digital Freeview channels and radio stations as well as download HD content direct to a TV or access media via a networked PC. The company says the iplayer has been developed to bring together entertainment and communication, so as TV evolves, so to does the iplayer, by downloading upgrades as and when new features are developed.

A key feature of the box is the ability to up-scale standard content so as to get the maximum potential out of any HD ready TV the box is connected to.

The unit also includes a 7 day Electronic Programme Guide (EPG) displaying all available programmes, as well as information about programmes currently viewing. Time-shift and advanced recording features, including informing the user of potential recording clashes, are also included as is an 80GB HDD to record content onto.

The player can also be integrated into a broadband home network and is compatible with any Internet service provider. Using the TV Max facility, whether connected to a networked computer or directly to the Internet, the iplayer enables Internet browsing, email functions as well as the ability to download and save podcasts.

Evesham Technology has packed features into its iPlayer set-top-box



## LG joins the next generation disc family

LG is the latest to throw its hat into the high definition disc ring with its blu-ray player, the BD100. The

The BD100 blu-ray player from LG



player can deliver 1080P output and of course includes HDMI connectivity. The unit also includes up-scaling abilities which allows users to watch their

existing DVD collections at a higher picture quality. The BD100, besides playing DVD and blu-ray discs, is also able to play music CDs as well.

LG also has a new range of LCD TVs to partner the BD100. The LB1DB series comes in 32", 37" and 43"

versions and includes an updated version of the company's XD engine image driver. There is also a new 47" 1080P HD ready LCD, the 47LB2RF, which delivers HD images at their maximum resolution, also an ideal partner for the BD100.

CEDIA courses include theory and hands-on experience



# EDUCATION

## for budding custom installers

CEDIA's education manager, Peter Aylett, explains how the organisation's education programme is continuing to grow, providing more and more training opportunities for people new to the custom installation market

Ten years ago the Custom Electronic Design and Installation Association (CEDIA) defined a new industry - the planning, design and installation of automated electronic systems for the modern, intelligent home. There are now nearly 4300 members worldwide and more than 420 member companies of CEDIA UK. And the CEDIA market in the UK and across Europe continues to grow.

This growth reflects the increasing demand for the services and technologies our members can install and integrate - anything from home cinemas to complete home networks and sub-systems to intelligently control lighting, security, HVAC (heating, ventilation & air conditioning), and even garden electronics. Homeowners, house builders, architects and interior designers are increasingly aware of the custom electronics profession and the benefits that using a CEDIA member will bring to a project. One of the key reasons for this recognition is the strength of the CEDIA Education

programme. This has enhanced the skills and knowledge of thousands of individuals, and continues to underpin the expertise and credibility of CEDIA members working in the industry today.

But the CEDIA Education programme is about much more than attending the odd training course. It is increasingly about delivering real benefits to individuals, consumers and manufacturers, by establishing clear, objective standards for the required skills and knowledge of electronics system designers and installers. That is why CEDIA Professional Certification is such a core part of the Education programme, allowing CEDIA certified designers and installers to be recognised as the most qualified contractors to perform design and install home electronic systems.

### Get set for success

Success in either the CEDIA Installer Level 1 and 2 or Designer Level 1 examination is rewarded with professional certification. CEDIA-

certified professionals must then take a minimum number of continuing education units 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. CEDIA intends to advance the custom electronics industry through the development and maintenance of this valid, credible and reliable certification system and recognises that industry needs will be met only by establishing such benchmarks for knowledge, performance and professionalism.

Whilst certification for many newcomers may be a long term goal, taking part in the CEDIA Education programme is key to finding out about the industry and whether you have got what it takes to work within it. The CEDIA education programme is made available to member and non-member delegates through a number of events that take place during the



Each year the CEDIA expo provides a whole range of seminars and training



year. The big education focus of the industry is the CEDIA UK Expo, which also acts as a showcase for manufacturing innovations in the sector, featuring exhibition stands from over 130 companies. Held at ExCeL London each June, the CEDIA UK Expo provides over 170 education hours for delegates at all levels and job roles, covering lighting design, security, HVAC, multi-room audio and video distribution and systems integration.

A number of these courses are especially useful to those custom installers new to the industry. The key seminar session for this group at the 2006 CEDIA Expo was the CEDIA Foundation Course. This is specifically focused on companies seeking to make the transition into the custom installation sector, identifying the essential business requirements for starting a custom installation company. Other courses at the Expo can prove equally useful, covering fundamental topics such as, amps, volts and watts, tools, wiring and connectors, multiroom audio

distribution systems, how to set up PC's, macs, broadband and printers for real families at home and an introduction to lighting design. The event and the education programme is a must for anyone thinking about starting out in the industry, so make a date in your diary now for 25-28 June

2007 when the CEDIA Expo returns to ExCeL London.

Before that there is the Integrated Systems Europe event, commonly known as ISE which takes place from January 29 to February 1 at Amsterdam RAI in the Netherlands. As a partner organisation to ISE,

CEDIA continually reviews and up-dates its courses to deliver the skills professionals need



CEDIA is heavily involved in its 2007 Education Program and is spreading the word of professional home electronic systems design and integration across Europe.

Here CEDIA's 'Introduction to Residential Multiroom Audio' will examine the differences between the brands, technologies and topologies for distributing audio around the home whilst, 'Introduction to Home Theatre Design' will educate delegates on the basic terms, elements and requirements of home theatre design. 'Introduction to the Residential Custom Installation Business' is aimed at new entrants to the integrated home business and will provide delegates with a thorough grounding in all aspects of the industry. There will also be the opportunity to take the 'CEDIA Installer Level 1 Examination' at the event.

Courses for newcomers also run outside of the CEDIA Expo and ISE, principally at the dedicated training facility at the CEDIA Head Office in St Neots, near Huntingdon. The newly developed 'Introduction to the UK Custom Installation Business' course

is a two day taster which provides a comprehensive overview of the custom installation business, taking in the technical, sales and marketing fundamentals of the industry. This course is set to run again in CEDIA's Spring 2007 schedule, and as industry expansion continues, will likely become a key component of the CEDIA programme in the years ahead.

Other courses currently on offer include a CEDIA Technical Foundation Course which offers an intensive technical introduction for newcomers to the industry. This course looks at a diverse range of classroom and workshop based topics, including an introduction to the sub-systems, the project process, skill requirements, AV components, connectors and connections, health and safety and component installation. This course is an ideal first step on the road to CEDIA Installer Level 1 certification.

In February 2007 CEDIA launches another entry-level type course – An Introduction to Designing Control Systems. This builds on two other successful courses that CEDIA has recently added to its programme

covering audio and video systems and calibration. Suitable for anyone wanting to get into specifying and installing control systems, this one-day course will look at control systems from programmable remotes to full-blown multi-touchscreen systems.

As new technologies come onto the market and new approaches are required, the CEDIA education programme will keep designers and installers up to speed with the latest techniques, information and training. It will also help ensure that those people coming into the market, including those from a TV repair and aerial installation background, are equipped with the right knowledge and skill-sets to maintain the high quality standards which CEDIA members have set for themselves and put them on the path to CEDIA Certification.

Full details of the CEDIA training schedule together with on-line booking of delegate places is available at [www.cedia.co.uk](http://www.cedia.co.uk). For further information on CEDIA UK call +44 1480 213744, email [info@cedia.co.uk](mailto:info@cedia.co.uk) or visit [www.cedia.co.uk](http://www.cedia.co.uk).

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# 50 YEARS AGO

By Keith Wilson

Without so much as a nod in the direction of the bright New Year dawning, our editor, in the January 1957 issue, plunges straight into gloom and despondency with the startling announcement that colour television has failed in America. His comments do make interesting reading, however.

Apparently, manufacturers in the USA had expected 1.5 million colour televisions to be in use by the middle of 1956, whereas the actual figure was lower by a quite staggering margin at just 80,000. This compares with an estimated 35 million monochrome sets in use.

With the benefit of hindsight, the lack of enthusiasm for colour is not surprising, as the item mentions that there were just 15 hours of colour transmissions per week, split between two networks. Add to that the cost of sets, which had 'fallen from \$1,000 to \$500' and the comment that constant adjustments were needed while the sets were in use, and it is easy to see why even those who could afford colour decided to wait a little longer.

On a more positive note, this month's cover had moved away from the kitchen table repairs which often featured in 1956, and instead shows a very well equipped workshop. The picture links to the 26th instalment in the 'Servicing Television Receivers' series by the late great Les Lawry-Johns, who was a regular contributor to the magazine for almost 40 years.

The sets covered by Les in this issue are the Bush TV1 and TV2 series which were superhets designed for double-sideband reception from Alexandra Palace. In spite of this, Les notes, even without alteration they gave good results with the new vestigial-sideband transmissions from Crystal Palace.

By today's standards, the circuitry used was simple,

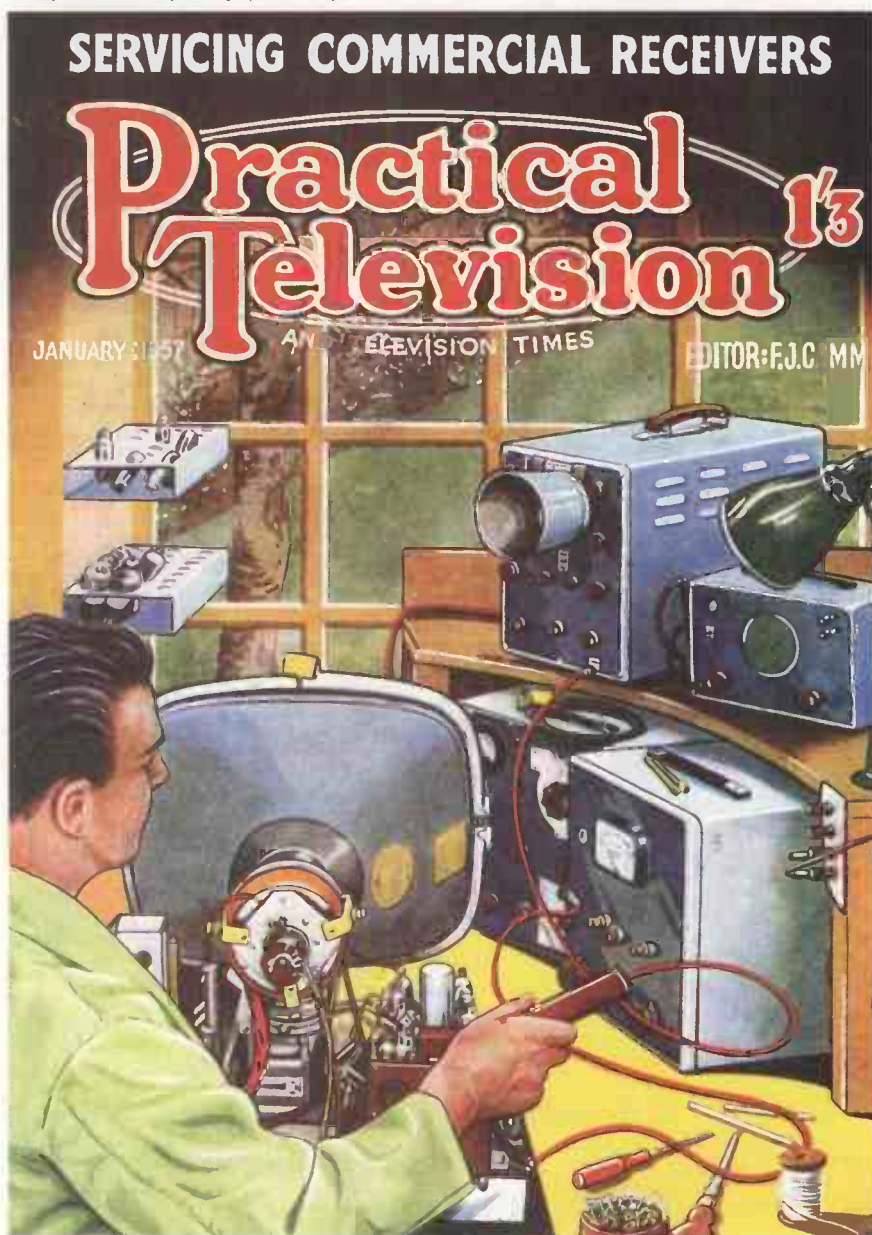
bordering on primitive. The diagram of the line output stage, for example, shows that it used only a handful of components. Among these, unfortunately, was a voltage divider chain made up of 8M2 resistors. No surprises that failures here are noted as a stock fault!

Several other 'usual suspects' also rate a mention, including frequent LOPT failures, tracking to

earth from the cathode of the EY51 rectifier – which apparently produced an objectionable smell – and, of course, problems related to the erratic performance of the thyratrons used as both line and frame timebase oscillators.

New developments were, however, in the offing, and an article about aerial filters and crossovers is accompanied by a

Shortly after the new year tidy up, obviously!





design in that side lobes appear at certain frequencies thus reducing directivity.

The calibration document **Figure 1** shows how a tested yagi measured within the set parameters.

### Feeder Pick-up Rejection

There was plenty of debate on this one when the standards were being discussed, probably because this had never been too onerous with UHF analogue. However, experience has taught us that it can be very troublesome for DTT reliability. Poor feeder pick-up rejection can allow impulse interference present on the outer braid of the coax to become present on the inner core via the aerial termination arrangement. After elimination of the most common cause of unwanted ingress – the poor quality coax feed – the next common cause of impulse noise from domestic appliances arriving at the TV reception equipment, is the aerial terminations.

Research has found balanced aerials are unlikely to conform to the required standard unless a form of 'balance to unbalanced' transformer is present in the termination design.

Aerials like the one pictured in **Figure 2**, where the coax outer braid simply connects to one side of the dipole are certain to fail here.

### Picking the right aerial for the job

Obviously high performance aerials are needed on the 'fringe' of reception compared with close proximity to the transmitter.

**Standard 1** – are therefore the high performers and the basis for specification here is an attempt at satisfactory DTT level without the need for masthead amplification. They are commonly bulky aerials, similar to the one pictured in **Figure 3** (opposite page), requiring substantial mounting masts and bracketry.

**Standards 2 and 3** – are intermediate and minimum, respectively and many quality existing aerials should achieve this status.

**Standard 4** – commonly relates to log-periodic design where wideband performance better than Standard 3 is required.

Standards 2 and 3 allow passage of 'grouped' aerials through the all the parameters described previously (refer back to last month's issue for channel group chart).

The rules have changed since the analogue days that forgave us a lot of sins as aerial installers. Close proximity to a transmitter may not always proscribe the use of what might be a high gain aerial. Tight beamwidth may be required to reduce side lobe pick-up or minimise signal from the rear. However, for now there are two main rules to bear in mind when assessing a location where DTT reception is to be considered.

1. Always use a benchmarked aerial for survey testing. The gain being achieved on each channel is more likely to be revealed with more certainty. Standard 4's, like the one pictured in **Figure 4** are good here, particularly where more than one transmitter is arriving at a given location.

2. Bear in mind, where DTT muxes are higher up the band, extra gain maybe the order of the day. In this case a Standard 2 maybe more beneficial than the commonly 'flat' response of the log-periodic. A fair number of wideband yagis perform well at the higher end of the band, their response tailing off through the group A section of the spectrum.

For more information on all of the above visit [www.cai.org.uk](http://www.cai.org.uk)

Figure 1

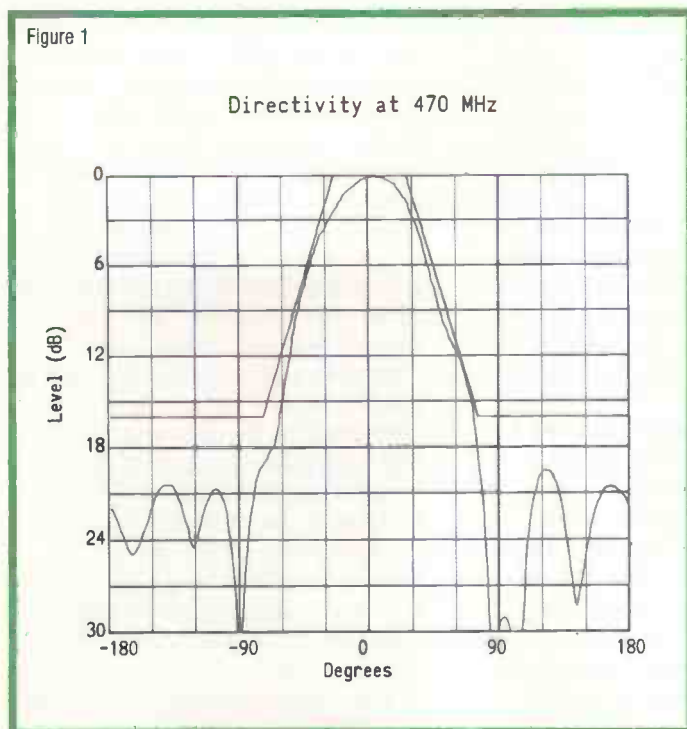


Figure 4

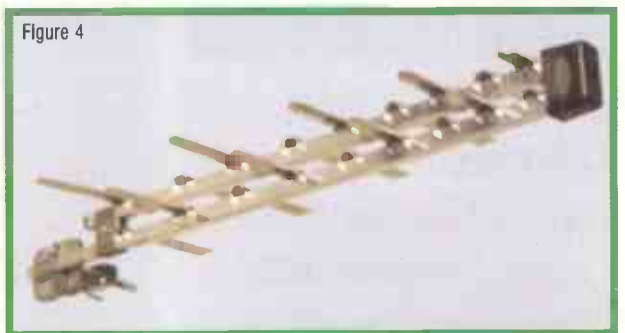


Figure 2



# Triple play:

## The need for speed and testing



Deploying IPTV: **Peter Collingwood**, regional vice president, Europe, Middle East and Africa for JDSU's Communications Test Division (formerly Acterna) argues that testing will have a crucial role in the race to deliver triple-play (phone, Internet and television) communications packages

**E**nticed by increased revenue per user and reduced customer churn, service providers are rushing to roll out integrated networks capable of delivering triple play services before their competitors.

Most importantly, consumers are anticipating a broader range of service options and features including TV and content at a competitive price. Announcements on IPTV deployments are rolling in thick and fast as telecom operators around the world introduce television services over their broadband networks. These moves clearly bring telecom operators into the realm of traditional broadcasters.

Great strides have already been made in broadband voice and data and the market is now poised for video Internet Protocol Television (IPTV). However, to make triple play and IPTV happen, efficient network deployment is crucial. Successful widespread IPTV adoption will hinge on a precise balance between rapid service delivery and on-going outstanding quality of service (QoS). Close attention to a quality installation and service assurance strategy that significantly reduces or eliminates early installation failures is key to striking this balance and ultimately, unleashing the full potential of the voice, video and data bundle.

### **A demanding audience and a complex infrastructure**

In the home consumer arena, TV is a highly emotional medium. Anticipation for a particular show or event can build for days, weeks and even entire seasons. When the awaited time arrives, viewers want a flawless entertainment experience, one where the delivery service performs perfectly.

This expectation stems partially from customer experience with the solid reliability of installed terrestrial and satellite broadcast systems. In the IPTV market, the expectation is magnified by the consumer trend toward high-definition entertainment systems. As consumers spend more and more on home entertainment gadgetry, quality of experience (QoE) expectations are growing exponentially as well.

These early adopters will not settle for service delivery that does not yield maximum satisfaction in the form of total quality entertainment. They will not wait patiently for any problems to be resolved. Providers may have only one chance to get the service right, or lose the customer for good. Sophisticated and educated, these consumers will demand immediate, quality pictures, perfect service, and performance from day one. If they don't receive this they will readily churn to the competition.

Understanding the complexity of deploying an IPTV service that will meet these high expectations begins with an understanding of the service itself. IPTV is not simply television over the Internet, it includes live TV as well as high-end options such as video-on-demand (VoD) and live pause/rewind/fast forward program control functionality. The service is delivered using Internet protocol over private networks with broadband connections. Through either a PC connected to the TV or a Set-Top Box (STB), a device that contains a small computer to decode the entertainment media data stream, customers choose and manipulate content for immediate and future viewing. Differing from terrestrial or satellite delivery mechanisms, IPTV communication goes beyond sending a selection and receiving the content. IPTV can include two-way interactive communication applications such as gaming, distance learning or video conferencing. By fully utilising the high-speed functionality of the broadband infrastructure, IPTV introduces the capability for the consumer to increase content control by establishing viewing schedules for stored content or selecting viewing sequences for broadcast video.

For service providers, delivering this enhanced capability comes at





What's wrong with this Picture? Faulty IPTV data transmission can leave the customer with unacceptable picture quality

the price of implementing new technologies and managing more complex networks. IPTV is made possible through the advent of technology and protocols to send high-speed transmissions reliably over a myriad of existing and emerging infrastructures. ADSL2+ and VDSL are enabling providers to maximise existing copper systems, while the on-going build-out of optical fibre to the network edge (FTTx) is bringing vast potential for new service delivery. Some providers prepare media streams to travel through their distribution and access networks to the customer's home and the in-home distribution network. But unlike VoIP and data services, IPTV requires continuous, in-depth testing and monitoring of the network infrastructure as well as proactive intervention to maintain the quality of the data travelling on it.

### A New Set of Testing Considerations

Acknowledging the sheer complexity of IPTV deployment is the provider's first step toward successful service rollout. Comprehensive planning for its unique test and measurement needs is the next. Bringing video flows online on a network already carrying data and voice traffic places greatly increased pressure on the infrastructure. The dynamic nature of video, with its frequent and rapid channel changing and VoD requests, is an issue that providers have not addressed previously in meeting voice and data class of service (CoS) parameters. In addition, IPTV cannot be tested reliably by traditional transport or access test equipment that may already be in place on a network. Those existing solutions do not have the capability to delve into IPTV's

application-specific QoS metrics or resolve trouble before it affects customer service. Essentially, IPTV-specific test solutions are needed for each sector of the service delivery network: head end, distribution, access and in-home. Transport and access testing are familiar tasks for service providers, but what is standard for traditional services has been re-defined for triple-play. Copper and fibre qualification take on new significance when preparing the physical plant to support the increased bandwidth required by simultaneous delivery of voice, video and data. As data rates continue to increase, use of wider frequency spectrums is required. This, in turn, means field technicians must carry a new class of tool capable of testing to new and more exacting specifications. With triple-play, the access loop no longer ends at the network interface device outside the customer's house, but extends throughout the in-home distribution network. Here too, a new set of tools is required.

With good planning, these refinements to transport and access testing can be assimilated into testing strategy as extensions of existing practices. Where the dramatic difference in needs and approach occurs is the digital video testing aspect. Service providers deploying IPTV face entirely new test methodologies and service assurance challenges. While digital video testing has many facets, the most important to consider is ensuring stream composition integrity. Systems and tools that maintain timing and synchronisation accuracy, assuring audio/visual quality and maintaining compliance with broadcasting industry standards, accomplish this.

The digital transport stream that brings IPTV service to customers' homes is different in structure and composition than the other data and signals travelling over the broadband network. Quality video stream content begins at the packet level in the head-end. Governed by MPEG-2 standards, each packet in the transport stream is coded at the head-end with extensive information needed to ensure QoS at its destination. Each packet must accurately retain this information as it moves through the distribution, access and home networks to the customer's STB.

service will not win the favour of the discriminating customer.

### A matter of timing

Buying trends show that consumers are ready to invest in new services. According to analyst firm Booz Allen Hamilton, more than 50% of European homes will be equipped with triple-play (phone, Internet and television) services by 2010 and the general feeling is that all major service providers are keen to claim a share of the services delivery profit. Never before has there been a situation where attention to the importance of test and measurement was so vital in realising the potential of a new opportunity. Informed providers will make the investment and those who do not will be quickly passed by their better prepared competitors.

Faulty IPTV data transmission can leave the customer with unacceptable picture quality. Particularly with flat-screen high definition TVs, a minute error can yield huge complications including loss of audio, lip sync errors, blocking, tiling or freezing.

Diagnosis for these problems is complex. One or a multitude of network conditions could result in garbled or missing sound and poor-quality images. Jitter on the line, packet loss, and faulty synchronisation are only a few of the conditions that can give way to unacceptable QoS. Using traditional test methods to measure IP parameters, a technician may find transport network performance to be within acceptable levels, yet QoS is not. Drilling down into the IP transport stream is the first level of problem solving, but to resolve QoS issues for IPTV, the technician must be able to delve into the MPEG transport stream.

Whether turning up IPTV service or responding to a trouble call, technicians must carry such an instrument that not only verifies service quality and IP transport parameters from the demarcation point, but verifies that the customer will be able to change channels and take advantage of fee-based services as well.

To retain customers and decrease repeat service calls, ultimately the provider must employ tools to verify content stream integrity as it is broadcast and a centralised, application-aware service assurance system to prevent errors that occur on the network from affecting the customer's QoS.

A minute error can yield huge complications including loss of audio, lip sync errors, blocking, tiling or freezing especially on flat-screen high definition TVs



The video stream is comprised of an endless flow of these packets, each carrying combined digital and audio payloads, and there are often multiple programs on each stream. To sort the millions of packets and arrange them to display synchronised sound and pictures, the stream carries an encoded map of the incoming content that directs the STB decoding process. In addition, an MPEG transport stream may include tables that list subscription and pay-per-view options as well as data for electronic program guides. Of concern for providers is that the complex contents of these flows have less tolerance for packet loss and jitter. Consequently, IPTV service requires distribution and access networks to perform to higher standards.

With this reduced tolerance, each IPTV data packet travelling across the network introduces the potential for error, error that will compromise viewing quality and erode the customer's confidence in and loyalty to the service provider. These errors can be tremendously difficult to locate and resolve. Lacking the appropriate equipment, technicians may spend

days sectionalising MPEG transport layer problems since these errors frequently cannot be detected on the IP layer. To effectively diminish this and other troubleshooting difficulties, providers can employ a comprehensive centralised digital video test system which looks into all IPTV data flows simultaneously, interprets stream maps and tables, and presents the results in a manner that enables the user to easily assess the health of the stream. Actions can then be taken, remotely if needed, to ensure high QoS.

Also important to note is that bringing the service to the customer's door is not where the IPTV service delivery challenge ends. IPTV service has unique in-home network testing considerations as well. When field personnel are dispatched to a residence, the cost of providing the service rises sharply if the technician cannot complete the job in one visit. The technician must carry tools that will emulate the customer's STB and obtain and validate video program flows and QoS values that have been established by the service provider. Additionally, the technician may need tools to test the in-home distribution network if acceptable service quality cannot be verified. Multiple visits resulting in poor quality service or no



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Loewe prides itself on minimalist design as well as technical innovation

# LIVING WITH LOEWE

Kevin Kelly, head of sales and marketing, LinnSight Ltd, exclusive distributor for the Loewe brand in the UK, describes the history, future and servicing policy of this quality German brand

The history of Loewe AG, today one of the leading premium brands in the consumer electronics industry, began in 1923 when research scientist and entrepreneur Dr. Siegmund Loewe opened a small radio repair shop in Berlin. From the beginning, the Loewe company has been characterised by a pioneering spirit and modern innovations. Loewe attracted international attention in 1931 with the introduction of the world's first electronic television set. Other milestones along the company's road to success followed with the first cassette recorder in 1951, Europe's first video recorder in 1961 and the first stereo television set in 1981. In 1985 Loewe introduced a new generation of design and technology oriented televisions with the revolutionary 'Art 1'. Less than ten years later, the company presented the first fully digital television based on 100Hz technology.

The Loewe product portfolio consists of a full range of televisions, DVD recorders, hard disc recorders, audio systems, and speakers. These components can be combined into complete audio-video system solutions that are perfectly matched in terms of technology and design.

An important factor in the Loewe

success story is the company's ability to combine high-tech innovations, quality design and operator convenience. Loewe products are characterised by clean-cut lines and elegant forms that virtually never go out of style, resulting in around 170 awards for excellent product design. Loewe appeals to customers who prefer individualistic lifestyles and enjoy owning truly extraordinary products.

## Technical focus and UK servicing

Loewe products have all the latest features, but differ in one major detail and that is that they go the extra mile to satisfy the needs of the most discerning customer. For example in an effort to make the control simpler, the design more elegant and to reduce the number of peripherals needed, Loewe championed integrated hard disc recording. We have been able to offer our CRT customers integrated hard disc recording (Loewe DR+) for the last three years or so, and most of our flat panel products over 32" have the option to include it as well. Looking to the future, we now aim to offer after-sale hard disc up-grades following the launch of our latest L2700 chassis at the end of 2006. This means that our dealers and service



partners now have additional revenue streams where they can add hard disc recorders, MPEG-2 encoders and Dolby Digital Decoders after the original sale to the customer has been made.

Loewe UK has established an efficient, professional network of trained, authorised LCD/Plasma Service Providers. The appointment is offered specifically to the trained engineer and not to the employing company and is renewed annually to ensure the latest training is received. To avoid repeating past servicing problems, we now appoint LCD/Plasma repair agents on a selective basis maximising geographical support to high growth sales regions. Priority is given to those service providers who have supported Loewe historically in the CRT market and who commit to training. In addition we have updated our processes to ensure that repairs are controlled internally, thus reducing the chance of non-authorised service providers carrying out non-authorised repairs.

As the UK CRT service provider network diminishes due to reducing CRT sales, we are now set with the task of rationalising and developing an effective regional network of established CRT service providers who can reliably provide professional after sales service to our many local CRT customers. This means that existing customers continue to support the Loewe brand and return to us to satisfy their future needs.

We continue to combine an in-home service via home calls from trained engineers or where necessary our own

technical liaison officers with a return to workshop repair policy. We operate an instant advance replacement policy for products that fail within 30 days of purchase to reduce the inconvenience to the customer.

The technical team set the standards, focussing on technical knowledge and real-time support, providing exceptional technical support to all authorised service providers and carrying out advanced regional dealer training for existing retailers. All new Loewe partners receive initial technical support and ongoing will be actively supported in-store by a LinnSight Technical Liaison Officer to ensure they remain technically proficient allowing them to develop their business. We measure and pride ourselves on accurate fault diagnosis, proficient supply of spare parts and prompt turnaround of repairs. Regular technical bulletins are published to keep our partners informed of all changes and issues. Service Providers have access to the Loewe Technical website offering information including all software upgrades, service manuals, chassis diagrams and BOM. A new spares and warranty claim web site is in its final stages of development and we look forward to its inauguration this January. This allows the service provider to place orders and submit subsequent warranty claims on-line. Spare parts are shipped direct to the workshop from Loewe.

Our customer service department regularly carries out a random end-user survey to monitor customer satisfaction to help drive improvement.



The Individual Compose includes integrated HDTV reception and an integrated DR+ hard disc HDTV recorder

The Trade Support team provide a clear, competent link between the dealer and our advanced support system. This reinforces our quality service and provides exceptional support to the service providers and Loewe partners to reinforce the purchase decision. Loewe produces premium products to satisfy the most discerning customer. We believe that the best way to engender customer loyalty is to excel in after sales service.

### Manufacturing base

Nearly 1000 people work at the main Loewe plant in Kronach, Germany. Of these, 120 are engineers and technicians assigned to the company's research and development departments and testing labs. As a medium-sized company, Loewe consistently benefits from short decision paths, flexibility in product development and manufacturing and a highly motivated, team-oriented workforce.



Loewe has a full range of TV and audio products to supply complete A/V solutions

# LIVING WITH LOEWE

Marking a special year in the Loewe history, the company finalised its initial public offering in 1999. In the 2005 fiscal year Loewe sales revenues reached over 319 million Euros.

The company is now present in 50 countries around the world and nearly 50% of Loewe's sales revenues were recorded in Europe (outside of Germany) and in other foreign countries.

LinnSight has been the sole distributor of Loewe products in the UK since 1996. There are around 300 Loewe dealers in the UK, mainly consisting of independent television and AV retailers, as well as smaller multiples such as House of Fraser department stores and Sevenoaks Sound & Vision.

Engineers wishing to apply to be authorised Loewe service providers should contact Patricia Smith, service and trade support manager, Linn Sight Ltd on 0800 0276465 or have a look at the Loewe website [www.loewe-uk.com](http://www.loewe-uk.com)

## KEY PRODUCTS FOR LOEWE IN THE UK

Loewe Reference ■ TV's and systems for Perfectionists – the best materials, the best performance, no compromise.

Loewe Spheros 26, 32,37 ■ LCD, "Full HD", integrated hard disc recording (Loewe DR+), motorisation

Loewe Individual ■ TV's and systems, elegant, prestigious, versatile, bespoke.

Loewe Individual Selection 26,32, 40 ■ LCD, HD Ready, DR+, five colours, nine individual trim pieces, motorisation – bespoke TV.

Loewe Individual Compose

40,46 ■ Launch December 2006 – LCD, Full HD, DR+, five colours, nine individual trim pieces, motorisation – bespoke TV.

Loewe Art ■ Sophisticated, all round balance and style.

Loewe Xelos 20,26,32,37,42 ■ LCD and plasma, HD Ready, DR+, Flexible stand options.

Loewe Light ■ High technology, functional design, simplicity.

Loewe – Concept 26,32 ■ LCD, HD Ready

Loewe – Modus 32 (Feb 2007),37,42 ■ LCD and Plasma, HD Ready

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17PF4110	179	32PF9967D	649
17PF8946	245	32PF9631D	649
20PF4110	220	37PF5520/21D	699
20PF5120	225	37PF9631D	949
20PF8846	259	37PF9830	1100
20PF5320	299	42PF3320	449
23PF4310	289	42PF5520D	599
23PF5320	299	42PF7520D	649
23PF4321	299	42PF7521D	669
23PF5321	299	42PF7320	739
23PF5310	299	42PF5421	599
26PF3320	349	42PF7621D	749
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# **Fault** REPORTS

## TV/Satellite/DVD/VCR Faults

### **Test Case 529**

**Michael Dranfield**

**John Coombes**

**Martin McCluskey**

**David Kerrod**

### **Solution to Test Case 529**

Grundig GDS200/1  
Amstrad DRX400  
Pace 3100 Sky+  
Panasonic TUDSB31  
Grundig GDS3000  
JVC LCD TV  
Sharp LC20S1E 20" LCD  
Bang and Olufsen MS6000  
Grundig T55-1120  
Hitachi C28WF560N  
Beko NR 15LB450  
Grundig ST63-755/9 (CUC6360) chassis  
Hitachi C32WF 560  
Osaki P10R  
Sharp 28HW-53H  
Phillips 32PW9617/05  
Sanyo CE28WN7-B  
Panasonic NV-F J620B  
Toshiba model 32YT56 chassis 11AK49  
Goodmans model GTV62W1VPL

Sanyo model CBP2180 chassis A5  
Philips model 32PW9534 chassis EM2E  
Sanyo model 28BN4F chassis EB6B28  
Hitachi model 42PD5300 plasma  
Sharp model 51DT25H  
Toshiba model 28W33B  
JVC model DR-MV1SEK  
Panasonic model DMR-E55EB  
Thomson Fault Report on ICC19 chassis  
LG RE32FZ10PX  
Panasonic TX25MD4 (EURO 4)  
Toshiba 28W23B (11AK37)  
Hitachi C2114T  
Hitachi C28W410SN-311  
Hitachi C28W1TN  
Naiko N2818W (PT 92 chassis)  
Sharp 66FW53H  
Matsui 28WV2N (Grundig CUC2059 chassis)  
Schneider widescreen sets  
Philips DVD 755VR  
Bush DVD 2004A  
Bush 2871NTX (11AK19)  
Sanyo CE28WN5  
Panasonic TX21AV1 TV/VCR combi  
Loewe XELOS 5381ZW  
Panasonic TX32DT2 EURO8  
Panasonic TX28PS5 EURO 10  
Panasonic TX32DTX10  
Sony KD28DX40 FE2  
PanasonicTX14B4T  
Panasonic DMRE75  
Sony SLVSE 720  
Sony RDRGX210  
Sony RDRVX410G  
Panasonic SAHT1500

## TEST CASE 529

The last time a Bush TV appeared in the Test Case column was in late 1987, in the form of an RBM (Rank Bush Murphy) set – it had loudspeaker trouble. Now we've got two faulty ones to describe. Isn't that typical? You wait for nineteen years then two Bushes come along together.

The first of them was an unusual model indeed: one of those internet-equipped jobs with a built-in modem and demi-computer. They were produced in 14" size a few years ago by Bush and Amstrad, but they never really caught on. This one was model ITV8401 (AK20S) and its fault was a very simple one: it would not respond to its remote control. Now this zapper is no ordinary handset – it contains a full QWERTY keyboard under a flap which forms its front panel. At each keystroke its little indicator LED flickered as it should. Even so, to be sure that all was well at the sending end, four new batteries were fitted. Still there was no response to it at the set. TV Ted fired the recalcitrant zapper at his little IR detector, plugged into his oscilloscope, and saw what appeared to be perfectly good command pulses, in bursts of square waves. Time to get into the TV set!

With the back cover off and the chassis withdrawn, Ted hooked his scope up to the output pin of the IR receiver module. He saw the same waveform as before, now in very clean, sharp 5V p-p form, and followed it, intact, into the control chip. What to do now? Either the remote control handset or the set's micro-controller chip could be to

blame, and neither was in stock at the workshop, nor did we have a manual or circuit diagram. Even so, the trouble was located and cured without the need for any hugely expensive bits. What ailed, and what was the cure?

The second Bush TV was much bigger, a model 6690D, fitted with the Turkish AK19 chassis that is used in various other makes and models. The set was pumping, with low-frequency bursts of suppressed energy in the power supply section. As with last month's Philips TV, this was because the line output transistor, here a Q605 (type 2SD2579) was short-circuit all legs. Well, there just weren't any 2SD2579s in the stores that day and so TV Ted consulted his trusty equivalents book. He came up with type BU2508AF, which was in stock, so he fitted one of them. Based on previous experience of these sorts of failure, he had a good solder-up of nearby joints in the line drive and scan circuits, particularly at capacitor C626 which appeared to have dark rings round both its joints on the PC board.

Ted switched on, and up came the sound and picture. Very little setting up was required (the line output transistor acts only as a fast on/off switch after all) before the back cover was replaced and the TV taken to the soak-test bay. However the set failed after a couple of hours' running, with the line scan transistor short-circuit once more. The third transistor to occupy the Q605 position did not fail because one other component had been changed. What was it? See on page 926

### MICHAEL DRANFIELD

#### Satellite fault finding

##### Grundig GDS200/1

This box said, 'no satellite signal received' on the menu. There was no quality and just a little signal strength, none of the power supply rails had any ripple on them, so faulty capacitors on the power supply were ruled out.

I checked the default transponder and LNB settings and these were found to be correct, 22kHz was present on the LNB socket and the polarising voltage was OK, so it seemed the tuner was faulty. I removed the tuner and tried it on my test rig and surprise, surprise, it was not faulty, so I did what I should have done in the first place and checked the voltages at the tuner's test points. Here I found the 30V tuning voltage was missing, in fact there was a dead short to ground on the 30V rail. The reason this had not shut down the box was a circuit protector was faulty on the power supply panel. I replaced this but still had to find the short, after much disconnecting of components on the main board, I

found the cause of the short was the R.F modulator.

I had a new modulator in stock, but when I came to fit it I found the new one had 9 pins and the old one appeared to have only 8. However, when the old one was removed the mystery and fault were solved and the new modulator was not required. It turned out that when the box had been made, pin 1 on the modulator had not gone through the hole in the board. Instead it had bent over and was shorting to the chassis. As the board had gone thorough the solder bath, the hole had filled up with solder and was completing the short. Funny how the box had worked for this long though.

##### Amstrad DRX400

This digibox came in tripping with the front LEDs flashing. It didn't take long to find an almost dead short to ground across the 20V rail line on the main board. The culprit turned out to be C828 (100nF) a small brown disc ceramic capacitor.

##### Pace 3100 Sky+

Beware when fitting a new R.F modulator in this box. Two different types are used. Either one will fit the

box, but they are not interchangeable. One has a small PCB fitted to the outside of the modulator itself and the other does not. Be sure to specify this when ordering.

##### Panasonic TUDSB31

This box came in working to a fashion, but the chopper transformer was screaming very loudly, the culprit was capacitor C818 (22µF) on the power supply panel.

##### Grundig GDS3000

A common fault on this model is no video output from R.F or SCART. The cause is always the video chip U12 (ML6429) and I found out why. It can fail if you plug in a SCART socket while the box is working, so on this model the moral of the story is not to hot-swap the SCART plug.

Another GDS300 had the same no video fault, but the cause this time was the power supply connector. The 12V rail (yellow wire) on the power supply had no voltage on one end. Moving the wire cured the fault, probably caused by a bad crimp. A new wire assembly from a scrap power supply cured the fault for good.



## TV fault finding

### JVC LCD TV

I forgot to write down the model of this JVC 20" LCD, but a label on the PCB said the TV was fitted with a vestell 17MB0-P-3 chassis. It was stuck in standby and it didn't take long to find the 5V rail was missing from IC904. Pin 5 of this chip was sat high, it should go low to enable the regulator. After some studying of the manual I decided that the fault could only be Q904 faulty as pin 12 of the micro IC301 was toggling when the remote was pressed. However, after a lengthy search I could not find Q904 on the PCB, but then its not unusual with vestell sets to find that components shown on the service manual are not actually fitted.

I decided to trace the print to see where pin 5 of IC904 went to. I got so far and then it went to a through board link, so I removed the board to look at the back and as soon as I turned the board over I spotted the fault. Q904, the transistor I had suspected was on the underside of the PCB, and the emitter connection had never been soldered from new.

### Sharp LC20S1E 20" LCD

This set would switch back to standby after 5 seconds. The problem was traced to the inverter panel where transistors Q6715 and Q6714 were found to be short circuit, surface mounted fuse F6704 was also open circuit. The cause was a dry joint on a blue capacitor C6724 (0.27µF, 250V). However, under close inspection I found that all 5 blue capacitors, as this is a five tube inverter driver, were all dry jointed. I would imagine that these capacitors were from a contaminated batch and had dirty lead-out wires causing poor solder adhesion. So I decided to replace all 5 caps together with the faulty transistors and fuse. With the inverter repaired, the set still went to standby after 5 seconds. A check at pin 2 (lamp error signal) on the inverter connector showed a DC voltage of 0.23V confirming the inverter panel was now working correctly, this pin will go high if the board has a problem.

On this model if any of the lamps fail to light after 5 attempts, the software signals a 5 second shutdown and the set will no longer work until the error code has been cancelled. To do this proceed as follows. Press the

volume down and external input buttons and switch the mains on. The letter K will appear in the upper left hand corner of the screen, release the buttons and press channel down and volume down buttons together. Release these buttons when the adjustment menu appears, now select "Error no reset" on line 3 and change this to O using the volume buttons. Exit the service mode and the lamp error will now be reset.

Part numbers for the 2SC5886 transistors are VS2SC5886++1Y, 0.27µF capacitors RC-FZA116WJZZ and fuse QFS-ZA002WJZZ.

### Bang and Oulfsen MS6000

A fault I have had a couple of times on this set is a short circuit chopper transistor TR1 (BUT12F). The cause is a dry joint on capacitor C12 6.8nF, 630V, you will also find TR10 (BC638) and TR11 (BC557B) either short or leaky.

### Grundig T55-1120

If you get one of these Orion based sets in with a shorted line output transistor (2SD2499) the cause is dry joints on the line driver transformer.

### Hitachi C28WF560N

The customer said this set switched to standby when she switched on her DVD player. It seemed a bit unlikely to me that the DVD would cause any problem with the TV. I went to look at the fault in the customer's house. Sure enough the fault description was spot on. As soon as the DVD was switched on, the TV went off. It turned out that the DVD was selecting the 16.9 picture format, when I put the set into service mode, I found that it switched off when stepping through the EEPROM settings when item 18 was selected. Obviously bad data in the EEPROM was the cause. Ten seconds on my chip programmer and half an hours setting-up was all that was required to set-up the EEPROM IC502 (24C16).

### Beko NR 15LB450

This 15" LCD set came in with picture but no sound. When I looked in the menu the sound system was set to BG and there was no option to change it. The cause is bad EEPROM data, proceed as follows. Press Menu on the remote control, then press 9301, this takes you to the service mode menu. Then press the green

fast-text button to get the sound set-up. Change 'I' to 'YES' with the volume up button and press TV/TEXT to store the setting and exit the service mode.

### Grundig ST63-755/9 (CUC6360) chassis

This set came in with very intermittent sound and a complaint that the picture goes off. After a couple of days soak test, the picture did indeed go off, but the CRT heaters were still lit. A slight movement of the PCB brought the set back on and it was eventually traced to dry joints on the stand up teletext panel. Quite a few of the soldered joints on the edge connector socket were poor. I have since had the same fault a couple of times on other sets.

### Hitachi C32WF 560

This set switched back to stand by after 2 seconds. The fault was caused by an open circuit safety resistor R603 47Ω in the 60V flyback supply to the frame output IC. However, the frame chip was not the cause of the demise of the resistor. It was, as usual in this set, bad data in the serial EEPROM IC502.

### Osaki P10R

This is a version of the popular baby 10 set for which I designed a new chopper power regulator (featured in *Television* in 1996). The set was dead and a common cause of this is an open circuit boost D410 (FR605). However, this diode gets very hot and not only heats up the PCB, but will eventually fail again. A better approach is to use a BYX71-600 bolted to the rear metal panel. There is already a convenient hole drilled for this enabling you to run a couple of insulated wires to the PCB. You will need an insulating washer also.

### Sharp 28HW-53H

This set needed a new LOPT. It was arcing over, so I was surprised to find the set dead after fitting the new one. Eventually, after studying the service manual, I discovered the problem. On the power correction panel there is a single pin that has a black wire connected to it. This should go to L6 on the main PCB, I had got this mixed up with L2 that connects to the aquadag earth. Why did I make such a simple mistake? Both wire colour and plug are identical, but one is longer

than the other and fits comfortably the wrong way round. The correct way is a bit of a stretch, which gives the impression it is the wrong one.

### Phillips 32PW9617/05

This set was dead apart from a relay clicking and the red led flashing on the front of the set, the cause was a dried out capacitor C202 (470µF, 25V) on the side mounted power supply panel.

### Sanyo CE28WN7-B

This set would trip out intermittently. Flexing the PCB would cause the trip-out. Eventually the cause was traced to a dry joint on the 128 pin SMD IC TDA1202H.

### VCR fault finding

#### Panasonic NV-F J620B

I spent more time finding the fault on this video than it was worth. It was tripping, many components were changed, but then it came on by itself and worked all day. However, the next day when plugged in it was tripping again. Eventually I replaced the STRG6352 chopper control chip which cured the fault.

## JOHN COOMBES

### TV faults

#### Toshiba model 32YT56 chassis 11AK49

Dark picture: In this case when the set was first switched on the picture was perfectly normal, but after an hour or more the picture started to get darker and darker. The picture would slowly disappear after many hours of operation and it could not be restored with the aid of freezer. Finally we traced the fault to the RGB output IC900 (TDA6108AJF) a replacement restored normal operation.

#### Goodmans model GTV62W1VPL

Loud whistle: This fault proved to be difficult to trace. We tried checking the LOPT and coils by movement or trying to damp them with the aid of insulator. After extensive tests we finally found coil L603 singing loudly and after replacement no more line whistle.

#### Sanyo model CBP2180 chassis A5

Frame fold-over: This at first may be a very intermittent fault with frame fold-over at the top of picture, but a gentle tap on the main PCB will very quickly lead you to dry-joints on the 12 volt regulator IC552 (7812). Resoldering will restore correct operation.

#### Philips model 32PW9534 chassis EM2E

LED flashing: If the LED is flashing this means the protection mode is operating and in this case it was due to short circuit in the line stage. This problem proved to be a faulty line output transistor 7421 (BU2520DF) that had gone short circuit. Before switching the set on we also replaced capacitors C2418 (220pF) and C2419 (33nF) to ensure normal operation takes place and to avoid the replacement of another line output transistor 7421.

#### Sanyo model 28BN4F chassis EB6B28

No start-up: If when switching the set on it will not start-up and the standby LED flashes, check the resistor R620 (120kΩ) for an increase in value which you can find in the primary circuit of the power supply.

#### Hitachi model 42PD5300 plasma

If the set is dead, but the relay keeps switching on/off, check for faulty diode D114 (ERA91-02) for short circuit in the power supply.

#### Sharp model 51DT25H

If there is frame fold-over at the top of the picture then check capacitor C514 (220µF, 35V) and replace to restore normal operation.

#### Toshiba model 28W33B

If the set is dead or maybe in some cases the picture has excessive width with pincushion distortion, this is due to capacitor C622 (12nF 1kV) gone short circuit.

### DVD Recorder faults

#### JVC model DR-MV1SEK

If there is no operation, but loading is flashing on the display, this can be traced to the regulator assembly. This is due to faulty capacitors C5205

(1500µF, 10V) and C5206/C5207 (2x 1200µF, 10V). These dry-up due to their position next to diodes D5205 and D5208. To prevent this happening again, it is necessary to move the diodes to the print side of the PCB and with the aid of a spacer (LP41241-007A) they can be fitted safely as advised by JVC Technical.

#### Panasonic model DMR-E55EB

Intermittently cuts out: When first switched on unit will run for sometime, but then just goes dead. However, after several days it goes permanently dead. This is due to Power regulator IC001 (STRG6353) which went short circuit, a replacement restored normal operation.

#### Thomson Fault Report on ICC19 chassis

### Power Supply Faults

One of the most common problems which can look like a power supply fault is that the standby LED blinks permanently a bright red. This is not a fault of the set, but a customer error caused by setting the child lock to be on. It may be necessary to check the instruction booklet to unlock this mode. If there is a fault were the set pulsates five or six times, the red LED flashes and the set beeps and then switches off, this is due to a faulty chopper transformer (LP020). If the set goes into a tripping mode with the red LED starting to flash, be sure firstly to check the HT output. If after disconnecting pin 6 of the LOPT, the HT is low with a reading of just 95V, check the RGB output chip IB01 (TEA5101B) for short circuit, this is on the CRT tube base panel. There are faults that occur with the LED flashing going into a protection mode, and most of these result from faults in the power supply. One of the common causes of this problem is diode DP10 (GP30M) and resistor RP10 (2.7Ω). Check by replacement as a diode or resistive check can be misleading. If the power supply still keeps pulsating, then check diode DP052 (1N4001GP) and/or capacitor for short circuit. If one or both components are faulty, then check resistor RP050 (10Ω) for open circuit. At this point it is also worth checking



diode DP050 (RGP10D) for open or short circuit. If all this proves to be negative, then check capacitor CP054 (470 $\mu$ F) for short circuit. If there are still no results, then check TP060 (BUL810TH) for short circuit. If TP060 does prove to be short circuit also check capacitor CP022 (470 $\mu$ F), diode DP022 (FUF4005) and resistor RP022 (100 $\Omega$  4.5W) and finally replace capacitor CP023 (2.2nF). Be sure all these components are replaced before re-trying the set or you may require a double replacement of components.

To check the power supply for correct operation it is necessary to use a lamp for the test. To start the test connect a 60W lamp to diode DP110 (USYS) also de-solder pins 4 and 6 of the flyback transformer (LLO08). Also de-solder IV001 pin 28 and pins 2, 3 and 4 of LP070. To continue the test it is necessary to short circuit base/emitter of TL063 and solder parallel capacitor CP061 (1 $\mu$ F). If the lamp flashes and USYS reaches about 70V, the front LED flashes (blinks after a few seconds).

It is important not to carry out the lamp test for more than 30 seconds. If the set switches to the protection mode after the set has got warm, then check the capacitors in the primary circuitry. Check capacitor CP040 (470 $\mu$ F), CP051 (100 $\mu$ F) and CP054 (470 $\mu$ F) check them all by substitution. All of the capacitors can be checked for low capacity or high ESR. In some cases it may be necessary to switch off the protection circuitry. Before doing this check transistor TP170 (BC847B) to ensure this has not gone completely short circuit. If this proves to be alright, then short circuit just the base to emitter of TP170 to override the protection circuitry.

## Line Stage Faults

The first line stage fault that can be experienced on this chassis is that the set will come on for a short time, then squeal loudly and go to standby mode with the LED not lit. This fault is due to the line output transistor TL030 having gone short circuit. But at this stage beware as there may be several different line transistors fitted to this chassis: TL030 (ON4977), BUH517 (p/no; 309001371) or BUH515.

After replacing the line output

transistor TL030 with the correct type, be sure to check the line driver transformer (LL001) for dry-joints because this can lead to the ruin of TL030. If after replacing TL030 it fails again, then suspect LOPT LL008, check by testing or replacement. If this all proves to be negative but the set will not start-up, check capacitor CL005 (470 $\mu$ F) for low capacity. If the set goes into a protection mode via the AV mode, this is due to a faulty capacitor CL067 (1 $\mu$ F 63V) check by replacement. On some of the earlier ICC19 sets when the line output transistor TL030 (ON4977) fails repeatedly, then it is necessary to replace coil LL031. However, on all the later models LL031 is deleted and a jumper lead is fitted in its place. If the East/West circuitry is at fault, firstly check capacitor CL029 (3.3 $\mu$ F) check for low capacity or an ESR reading. If this proves negative and there is still no East/West correction, then check resistors RL027 (470 $\Omega$ ), RL028 (470 $\Omega$ ) and RL026 which may vary in value according to model and size of CRT. If there is no start-up and the LED flashes after 3 start-up attempts, check the decoupling capacitors CL005 (470 $\mu$ F), CL004 (10 $\mu$ F) and/or CL001 (1000 $\mu$ F) check ESR reading or by replacement. If all this proves to be negative, but the set still does not start-up, then suspect the LOPT (LL008) check DC conditions or resistance of windings. If the line output stage buzzes loudly with vertical lines on the picture, check capacitor CL029 (3.3 $\mu$ F) or it maybe (470nF), according to which model is under test. If the set trips and LED flashes, check the LOPT (LL008) for shorted turns. In some cases the LOPT (LL008) shows signs of failure because of the glue type material which can be seen on top of the transformer and around the controls (focus and G2 screen). This leaks, but then hardens preventing protection to the windings allowing them to go shorted turns.

If the EHT is present, but there is no picture, check the G2 screen control, this maybe on the transformer or on earlier models it is positioned on CRT tube base. If after advancing the control there is still no picture, then the control is at fault, check the DC conditions. If present but very low on the transformer,

replace faulty (LL008). If there is intermittent operation with the EHT and picture coming on alright but when warm it cuts out, check for dry-joints on the LOPT (LL008) re-soldering will restore normal operation. If this proves to be negative, then check the scanning coil plug/socket for dry-joints or even a high resistance connection. To cure the problems, re-solder dry-joints and re-make the high resistance connection. If the LED flashes permanently very slow and after a few attempts cuts out, check capacitor CL005 (470 $\mu$ F) by replacement. Be aware that this capacitor may not read faulty as the fault only occurs when set is cold.

## Frame Stage Faults.

The most common of faults in the frame stage is frame collapse. The first and obvious check is the frame output IC IF001 (TDA8177F) check by replacement. But before replacing IF001 check for dry-joints, in some cases a slight tap on the heat-sink can reveal a fault which if re-soldered can restore normal operation. If however this proves negative, then check for 13V on pin 5 of IF001, if missing then check resistor RF020 (270 $\Omega$ ) for open circuit.

If this proves to be operating correctly, check capacitor CF015 (2200 $\mu$ F) for short circuit. Check also zener diode DF011 (68V) for short circuit. If after all these checks there is still a problem, then check for dry-joints or high resistance connection on the frame scanning coils or on the plug/socket BF001.

If the scanning coil voltage is being pulled down, then suspect that the coils have gone shorted turns. If the frame output IC IF001 (TDA8177F) is overheating and prematurely failing, check capacitor CF029 (470 $\mu$ F) check for low capacity or high ESR reading. If the frame output stage appears to be operating correctly, check back to the video processor combination IC IV001 (STV2162) and in particular pin 25 for frame drive waveform. If there is no frame drive waveform or the amplitude is incorrect then suspect IC IV001 (STV2162) as being at fault, check by replacement. If the set goes into a trip mode and pulsates 3 times, check the resistor RF07

(10k $\Omega$ ) for open circuit in the frame stage. In a few cases if frame jitters and a little bit of line tearing occurs, this can be due a faulty capacitor CV006 (100 $\mu$ F) decoupling on the VCC line, but this only happens when the set is cold.

## Video/text faults

If the text and on screen display is distorted be sure to check capacitor CV357 (4.7nF or maybe 1 $\mu$ F dependant on model of set). In some cases if the picture is present and operating correctly, but there is no text, then replace the feature box or trace to source if diagram is available. If there is no on-screen display or no operation after a few seconds with a loss of front panel and remote control functions, then replace EEPROM IR003 (M24C64N). If the EEPROM is at fault, it can also give loss of sound with the picture normal. If there is no auto channel search and the picture in manual programming is out of sync, then the EEPROM has been changed from a 24C32 to 24C64. In this case it is necessary to go into the service menu and check set-up menu for tube type and then into geometry menu HVCO. If there is no channel storing, then activate the service menu. Next, find the set-up and select a clear programme to reset channel memory. If there is no luminance but the on screen display proves to be alright, check the luminance signal at pin 4 of IC IV001 (STV2162). If this proves to be alright, then check the luminance signal on pin 26 of IV601 (TDA9143N3) but if it proves to have no output on pin 12, then suspect IV601 (TDA9143N3) as being at fault, check by replacement.

If there is a bright raster and the set cuts out, firstly check resistor RB06 (470 $\Omega$ ) for open circuit. If resistor RB06 proves to be open circuit, be sure to check diodes DB31 and/or DB32 (BAV21) for short circuit. If the diodes are at fault then also replace IB01 (TEA 5101B) RGB output IC which will also have gone short circuit. If this proves to be alright, then check that the LOPT LL008 with the G2 control is not at fault. This may also be very intermittent, but the only cure is to replace the LOPT LL008. If at the other end of the spectrum there is a dark picture and no remote control functions or front panel operation, this could mean the micro

processor is waiting to be told the CRT is warm. Check to see if there is no cut-off measuring pulse at pin 39 of IV001 (STV2162). If missing or incorrect, suspect TB18 (BC558B) for short circuit, this is mounted on the CRT tube base.

If there is poor focus or maybe intermittent loss of focus, check the tube base for poor connection or for corrosion on the focus pin 1. If however there proves to be an intermittent loss of picture, this can be due to poor connections on pin 9 and pin 10 of the CRT connections. This is caused by a loss of heater supply to the CRT. If this all proves to be alright, check the connections on pin 3 and pin 4 of the plug and socket (BB02) check for dry-joints or high resistance connections. If this still proves to be negative, then check for dry-joints on pin 2 and pin 3 of the LOPT LL008.

## Miscellaneous faults

If the set changes channels automatically or the volume increases on its own, check if the volume fault will also occur when the remote control is operated. If this does occur, then check for high resistance contacts on the customer user controls, sometimes the membrane develops a leak or cracked connection, check by replacement.

In some cases if there is a dark picture check by replacement transistor TV001 (BC856B) or carefully check the DC conditions.

If the picture is red or maybe green, check for high resistance on RGB output IC IB01 (TEA5101A). To be sure of clearing fault, remove IC, clean PCB, IC pins and also ensure there are no dry-joints on associate components. Then seal both sides of CRT tube base with a spray to protect from humidity and dust.

In a few cases if the line output transistor TL030 (ON4977) has blown, check the video/deflection IC IV001 (STV2162) check DC conditions or just by replacement.

In a few cases customers have experienced the stand-by LED blinking a permanent red. This can be restored to normal function by unlocking the child lock.

If there is a black picture when the mains switch is turned on with the LED showing orange, then check capacitor CR092 (470pF) which decouples the input line.

## Remote Control Faults

The most common problem here is the wear of the rubber sheet. This can give poor contact on some or all channels, maybe poor volume response or maybe no menu text functions. Another fault to watch for is the TV/VCR button can sometimes be set by accident to the VCR position so TV mode will not function. The other problem that should be checked is for flat batteries, but if this proves to be alright then check the battery contacts. These maybe corroded with leaky battery acid or spillage or there may be a high resistance connection due to poor soldering on the remote PCB. If they are just corroded, a clean may restore normal operation. Finally if remote control appears to check-out OK, check for a faulty infra red receiver or check for dry-joints on its connections, re-soldering may restore normal operation.

## MARTIN McCLUSKEY

### TV faults

#### LG RE32FZ10PX

The customer said there had been a bang from inside the set, followed by smoke, after which the set had continued to work, but with excessive width. Visual inspection of the circuit board in the line output area revealed that C488 (10 $\mu$ F 400V electrolytic capacitor) had burst open, and C481 (0.22 $\mu$ F 400V) was bulging at one side. Both these components were changed and at switch-on the set fired up and produced a picture, but C488 showed immediate signs of distress.

I switched off and consulted the circuit diagram. C488 together with diode D410 and 5W resistor R490 (10K) are connected in parallel with the main line scan coupling capacitor C412 (0.15 $\mu$ F 400V). If this component was open circuit, the full scan current would flow through electrolytic capacitor C488, with disastrous results, due to internal resistance causing rapid overheating. I replaced C412 and fitted another 10 $\mu$ F 400V capacitor. This time everything was fine at switch-on with no signs of distress anywhere on the circuit board. A long soak test showed that no further faults were present.



## Panasonic TX25MD4 (EURO 4)

At switch-on there was a rustle of EHT then after a few seconds the set reverted to standby. The cause of this fault was very simple – several pins of the field output chip IC 451 were dry jointed. With this chassis the microprocessor shuts the set down if field pulses are not detected within a few seconds of switch-on.

## Toshiba 28W23B (11AK37)

Dead, was the customer's complaint with this widescreen set. In fact the set was tripping with a short circuit measurable from collector to emitter of the line output transistor. However, the culprit was the HT rectifier diode D808. I fitted a new UF5407 then switched on, but when the set was brought out of standby, there was a loud screeching from the power transformer. With the set in standby mode everything seemed normal. However, a meter check across the mains HT reservoir capacitor C609 produced a reading of less than 300V. Much to my relief, a new 150µF 400V capacitor restored normal operation.

## Hitachi C2114T

At switch-on there was a burst of EHT, then the set reverted to standby. I've had this fault before and went straight to R951 (39K) in the power supply HT regulation circuit. It had risen in value to over 43K and a new resistor cleared the fault.

## Hitachi C28W410SN-311

This set produced an excellent picture when first switched on, but after an hour or so the whites became distorted and washed out – rather like an AGC overload. The cause of this fault was very simple. Next to the decoder and timebase generator 'jungle' IC, there are two small disc capacitors. In between these components is a short link wire which connects to both sides of the circuit board. Re-soldering this link cured the problem. My thanks to Hitachi technical for this information.

## Hitachi C28W1TN

At switch on there was a rustle of EHT with the usual field buzz from the scan coils, then after two seconds the set reverted to standby. Re-soldering the voltage regulator ICs made no difference and the HT voltage was

correct. A new TDA8350Q field output IC cured the problem.

## Naiko N2818W (PT 92 chassis)

The set appeared to be stuck in standby with the red LED showing, though the power supply was providing 145V HT. I noticed that RD05 (22Ω) and DD07 (BY228) in the line output area looked distressed. New components brought the set to life, but the picture was narrow with East/West bowing. Further inspection of the board with a magnifier revealed DD08 in the East/West modulator circuit to be dry jointed. Re-soldering this and other coils and capacitors in the area restored normal operation.

## Sharp 66FW53H

This set came in with a line collapse. The 0.56µF 250V scan coupling capacitor was distressed and R613 (2K2 1W) had burnt out. Replacing these components brought the picture back, but there was excessive width and East/West bowing. Correct picture geometry was restored by changing coil L603 and surface mounted East/West transistor Q506.

## Matsui 28WV2N (Grundig CUC2059 chassis)

At switch-on this widescreen set powered up with a burst of EHT, then shut down again. This procedure repeated itself several times then the set reverted to standby. This chassis can suffer from bad joints, so I started by inspecting the circuit board with a magnifier. The soldering was poor on several capacitors in the line scan and East/West circuits. Also the capacitor in the chopper transformer's snubber network was loose to the touch. I attended to these joints, and for good measure resoldered the pins of the field output chip. After this, the set fired up every time and a long soak test proved that no further faults were present.

## Schneider widescreen sets

If the problem is excessive width with East/West bowing, look no further than C313 (12µF, 100V) in the East/West diode modulator circuit. This is an unusual value, but a 10µF capacitor rated at 100V or more is a suitable replacement.

## DVD faults

### Philips DVD 755VR

This combined VCR and DVD player appeared to be completely dead. I had no service information, so began by making cold checks in the power supply circuit with the machine unplugged – having first discharged the mains HT reservoir capacitor using a 40W light bulb. D106, a small rectifier diode on the secondary side of the chopper transformer, measured short circuit. I could not make sense of the markings on this component, so fitted a BYX 55-600 diode rated at 600V 1.2A. Older readers may remember these bright red bullet shaped diodes being used in the East/West modulator circuits of Decca and Philips TVs from the late 1970s – I still have a drawer full of them! This restored life to the machine and the set has not been back in.

### Bush DVD 2004A

This budget priced DVD player was dead although the power supply was working and producing secondary voltages. I noticed that C18, the reservoir capacitor for the 5V supply rail, was leaking electrolyte onto the circuit board. A clean up and a new 1000µF, 16V capacitor restored normal operation. But, how much can you charge for repairing a product that the customer can buy in a supermarket for around £25?

### Bush 2871NTX (11AK19)

When brought out of standby, the front LED turned green but the set remained dead. Attention was turned to the BU2508AF line output transistor. A meter check at its collector produced a reading of over 140V, and line drive was present at the base connection. The problem was caused by a dry jointed link wire that connects the emitter to earth. The soldered connection looked OK, but measured open circuit. An intermittent connection here can result in a short circuit line output transistor.

DAVID KERROD

### Sanyo CE28WN5

This set was dead with no LEDs lit and no shorts in the power supply. The Standby transformer T681 was open circuit.

## Panasonic TX21AV1 TV/VCR combi

At switch-on the cassette cartridge shuffled briefly but the set would not come on. With the LOPT disconnected, the HT was OK. Disconnecting the +58V and +15V allowed the set to switch on with frame collapse. Replacing I301 TDA8358J restored the set to working order.

## Loewe XELOS 5381ZW

A dead set with no LEDs lit and no mains input to the main PCB. Checked the standby transformer on the mains on/off switch PCB. This was open circuit, Pt no 490-22142-001.

## Panasonic TX32DT2 EURO8

Intermittent yellow picture was the fault. After cleaning the CRT base and re-soldering poor joints on the CRT PCB, the fault remained. Monitoring the blue input to IC371, pin 3 went low and a crack at the top of the CRT base was found.

## Panasonic TX28PS5 EURO 10

There was a popping noise from

this set with the picture OK but no surround sound. The +42V was varying, IC2403 LA4282 was faulty.

## Panasonic TX32DTX10

No sound or picture, just a blast of sound and the red LED flashing at switch-on was the fault. All the power supply voltages were OK and the CRT heaters were lit. We eventually fitted a new A PCB (micro video processor etc) TNP8EA021AR which cured the fault.

## Sony KD28DX40 FE2

No sound/picture, but with the green LED lit. Fault cured by replacing R610 330kΩ resistor.

## Panasonic TX14B4T

This set had frame collapse. The +V to the output IC were OK and there was briefly frame drive from I501. Replacing the drive IC I501 did not cure the fault, so I then replaced the EEPROM IC I702. This restored the set to a snowy picture. Replacing the tuner as well gave me a good picture. Fortunately the set was in warranty.

## VCR/DVD faults

### Panasonic DMRE75

Poor playback and record with the picture streaking. Check in the VCR menu that the SQPB is in auto mode and not on.

### Sony SLVSE 720

No picture in playback similar to dirty heads was traced to the video processor IC301 pt 180470211.

### Sony RDRGX210.

No reading of DVDs was cured by replacing the DVD drive unit.

### Sony RDRVX410G

This DVD/VCR combi would eject a cassette straight away. As the cassette went in it was not level. On the left side there is a very stiff ribbon cable connector CN2 which was in the line of the carriage.

### Panasonic SAHT1500

This AV system had the code AF61 at switch on. After checking with Panasonic, this indicates a fault on the LT DC rail. C26 in the -8V was short circuit. This is on the top PCB.

## SOLUTION TO TEST CASE 529

The Bush brand started as Bush Radio in 1932, and became part of the Rank empire in 1945. After a somewhat chequered history it's now become part of the Alba Radio group, with production in Turkey and elsewhere, and with no real links, apart from the name, with the original Bush/Rank lineage. Ted remembers 'real' Bush sets, and successfully repairing them, but he seemed really stuck on this little internet-ready Turkish Bush. It is unlikely that spares or manuals would be easily available now for the ITV8401, and TT was about to give up on it, bearing in mind that 14" portable TVs could be had in the supermarket for the price of about 1? hours' labour, when Workshop Sage came

sauntering past. Sage knew about these – his brother had one. He 'cured' the remote control problem by re-initialising the zapper: you press the four keys left, right, down (symbols) and 1 simultaneously, and hold them all down for about five seconds, while the nearby red LED throbs. As if by magic, the zapper controls the TV perfectly thereafter.

Regarding the big 6690D model, long investigation revealed the culprit to be line-stage resistor R268, which is 2R2 for 110° sets, 27R for 90° models. In this case it was going intermittently high-resistance, duffing out the line output transistor when it did so.

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New or second hand would be fine  
contact Michael on 01773 813569  
or mick@mickash.fsnet.co.uk

**WANTED:**  
Been trying to get an IC for the switch mode power supply for Panasonic DVD recorder, DMR E55EB-5 type number STR-66353 or STRG-6353. It is a T0220 package with 5 legs, would require two (one for spare). All costs met, thank you.  
Contact Harold at 01977 795092  
or lucan4me@aol.co.uk.

**WANTED:**  
Output cable for Hitachi camcorder. Model: VM-E31E. It is a 20 pin socket 9mm by 7mm approx  
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Television gathers faults  
and tips direct from the  
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and experts

# Faults DIRECT

## Daewoo LCD

Model DLP2612/DLP3212  
chassis SL210P

**Symptom:** Faint line down the middle of the screen, with the left side of the picture darker than the right side.

**Reason:** This chassis incorporates an I/C to improve the picture quality. It is part of the MGD! circuitry.

MGD! means (Meta Genuine Digital Image) and performs automatic adjustments to the image by analysing each frame and changing the Contrast and Hue and Brightness accordingly to produce a vivid picture. This circuitry can be switched on or off, or put in DEMO mode accidentally, by someone playing with the remote control. Unfortunately, this line down the screen has sometimes been incorrectly diagnosed by some service agents, as a fault with the screen, so have replaced it, only to find the problem still apparent, then arranged for the

set to be exchanged.

**Cure:** Using the remote control, select MENU, then Features, then MGD!, then turn off the DEMO mode and then chose to have the MGD! on or off. It would normally be left on, as this would produce the best quality picture.

## Sanyo LCD. TV image controls

Sanyo wishes to clarify the Image picture settings used on later CE27/30LC/LD3-B models with the UB4-B chassis fitted.

The following information is with respect to the Personal settings which can be found in the normal customer picture settings menu. The image settings were changed on later models to improve the developed image on screen.

**Models:** CE27LC3-B, CE27LD3-B,  
CE30LC3-B & CE30LD3-B  
**Chassis:** UK4-B

## TV Original Picture Settings

- Personal Brightness Settings Data Value 25
- Personal Contrast Settings Data Value 55
- Personal Colour Settings Data Value 32
- Personal Sharpness Settings Data Value 02

## TV Later Picture Settings

- Personal Brightness Settings Data Value 32
- Personal Contrast Settings Data Value 55
- Personal Colour Settings Data Value 32
- Personal Sharpness Settings Data Value 04

## Beko

At BEKO we are often asked about component variations for different CRT types in the same model.

Figure 1 (opposite) lists position numbers and values of components for different CRTs used in BEKO 14.1 and 14.2 range.

BEKO recommends that the component values are checked when a CRT or chassis is changed, before entering the service mode and doing any necessary adjustments.

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Figure 1: Beko component variations

TYPE	BEKO NO	SUPPLIER	U1	C513	C518	C519	R529	R518	R519	D606	TR601	SMT	L502	C821	R626	R646	R613	R504	C501	R520	J614
20" SAMSUNG	056320-SB8	A48ECR141x51 DT	119 V	9.1 nF	-	-	0.47 R	2.7 R	3.3 R	OPEN	057034-EL2/TR2	059034-EL1/IOG1/TR1/ITL1	55 uH	390 nF	115 K	5.6 K	-	-	-	-	SHORT
20" SAMSUNG	056320-SB9	A48ECR143x51 DT DR	119 V	9.1 nF	-	-	0.47 R	2.7 R	3.3 R	OPEN	057034-EL2/TR2	059034-EL1/IOG1/TR1/ITL1	55 uH	390 nF	115 K	5.6 K	-	-	-	-	SHORT
21" EKRAMAS	056321-EK1	A51EJ01X01	121 V	8.2 nF	-	-	0.47 R	2.2 R	2.2 R	OPEN	057034-EL2	059034-EL1/IOG1/TR1/ITL1	55 uH	390 nF	115 K	10 K	-	-	-	-	OPEN
21" S-NOVEL	056321-NV2	S45X504722-DC04	118 V	7.5 nF	-	-	0.47 R	3.3 R	2.2 R	OPEN	057034-TR2	059034-EL1/IOG1/TR1/ITL1	55 uH	390 nF	115 K	5.6 K	-	-	-	-	OPEN
21" PHILIPS	056321-PH4	A51EAL155X01	117 V	8.2 nF	-	-	1.5 R	1.8 R	3.3 R	OPEN	057034-EL2/TR2	059034-EL1/IOG1/TR1/ITL1	55 uH	390 nF	115 K	5.6 K	-	-	-	-	SHORT
21" SAMSUNG	056321-SB4	A51EER131x28	120 V	8.2 nF	-	-	0.47 R	-	1.2 R	OPEN	057034-EL2/TR2	059034-EL1/IOG1/TR1/ITL1	55 uH	390 nF	115 K	10 K	-	-	-	-	SHORT
21" SAMSUNG	056321-SB7	A51EER131x41	116 V	8.2 nF	-	-	0.1 R	-	1.2 R	OPEN	057034-EL2/TR2	059034-EL1/IOG1/TR1/ITL1	55 uH	390 nF	115 K	5.6 K	-	-	-	-	SHORT
21" SAMSUNG	056321-SB9	A51EER33x78	121 V	8.2 nF	-	-	0.47 R	1.2 R	1.5 R	OPEN	057034-EL2	059034-EL1/IOG1/TR1/ITL1	55 uH	390 nF	115 K	10 K	-	-	-	-	OPEN
21" SEG-HITACHI	056321-HT1	A51JSY63X13 (C)	117 V	9.1 nF	-	-	0.1 R	-	1.2 R	OPEN	057034-EL2	059034-EL1/IOG1/TR1/ITL1	55 uH	390 nF	115 K	5.6 K	-	-	-	-	OPEN
21" THOMSON	056321-TH1	A51EFS83X191	119 V	8.2 nF	-	-	0.1 R	-	1.2 R	OPEN	057034-EL2	059034-EL1/IOG1/TR1/ITL1	55 uH	390 nF	115 K	5.6 K	-	-	-	-	OPEN
25" PHILIPS	056325-PH2	A59EAK071x11	147 V	1.5 nF	10 nF	22 nF	2.7 R	1.2 R	1.8 R	RGP 30K	058534-TR2	059034-EL1/IOG1/TR1/ITL1	30 uH	470 nF	150K	2.7 K	-	-	-	-	SHORT
25" PANASONIC	056325-PS1	A59EFCF50x05	145 V	1 nF	10 nF	22 nF	2.2 R	1.5 R	1.5 R	RGP 30K	058534-TR2	059034-EL1/IOG1/TR1/ITL1	39 uH	470 nF	150 K	SHORT	-	-	-	-	SHORT
25" TESLA	056325-TE2	A59EM253X07	147 V	1 nF	11 nF	22 nF	2.2 R	1.5 R	1.5 R	RGP 30K	058534-TR2	059034-EL1/IOG1/TR1/ITL1	55 uH	560 nF	150 K	2.7 K	-	-	-	-	SHORT
25" PHILIPS	056325-PH2	A59EAK071x11	147 V	1.5 nF	10 nF	22 nF	2.7 R	2.2 R	2.2 R	RGP 30K	058534-TR2	059534-EL1/IOG1/PH1/TR1	30 uH	560 nF	150K	2.7 K	0.47 R	180 K	10 nF	220 R	OPEN
25" VIDEOCOLOR	056325-VC4	A59EHJ13X38	147 V	1.5 nF	10 nF	22 nF	0.68 R	1.8 R	4.7 R	RGP 30K	058534-TR2	059534-EL1/IOG1/PH1/TR1	39 uH	560 nF	150 K	2.7 K	0.47 R	180 K	10 nF	220 R	OPEN
28" PHILIPS	056328-PH6	A66EAK071x11	147 V	1.5 nF	10 nF	22 nF	2.7 R	2.2 R	2.2 R	RGP 30K	058534-TR2	059534-EL1/IOG1/PH1/TR1	39 uH	560 nF	150K	2.7 K	0.47 R	180 K	10 nF	220 R	OPEN
28" PHILIPS	056328-PH7	A66EAK075x11	147 V	1.5 nF	10 nF	22 nF	2.7 R	2.2 R	2.2 R	RGP 30K	058534-TR2	059534-EL1/IOG1/PH1/TR1	39 uH	560 nF	150K	2.7 K	0.47 R	180 K	10 nF	220 R	OPEN
28" VIDEOCOLOR	056328-VC4	A66EH43x62	145 V	1.5 nF	10 nF	22 nF	1 R	1.8 R	4.7 R	RGP 30K	058534-TR2	059534-EL1/IOG1/PH1/TR1	30 uH	560 nF	150 K	SHORT	0.47 R	180 K	10 nF	220 R	OPEN
28" VIDEOCOLOR	056328-VC6	A66EHJ13x62	145 V	1.5 nF	10 nF	22 nF	1 R	1.8 R	4.7 R	RGP 30K	058534-TR2	059534-EL1/IOG1/PH1/TR1	30 uH	560 nF	150 K	SHORT	0.47 R	180 K	10 nF	220 R	OPEN
28" VIDEOCOLOR	056328-VC7	A66EHJ13x38	145 V	1.5 nF	10 nF	22 nF	1 R	1.8 R	4.7 R	RGP 30K	058534-TR2	059534-EL1/IOG1/PH1/TR1	30 uH	560 nF	150 K	SHORT	0.47 R	180 K	10 nF	220 R	OPEN
28" PANASONIC	056428-PS1	W66EHK51X36	140 V	1 nF	12 nF	19 nF	1.2 R	2.2 R	3.3 R	RGP 30K	058834-TR1/TR3	059834-EL1/ITR1	45 uH	680 nF	150 K	33 K	0.47 R	180 K	10 nF	220 R	OPEN
28" THOMSON	056428-VC1	W66EJU023X015	138 V	1.8 nF	13.1 nF	19 nF	1 R	3.3 R	3.3 R	RGP 30K	058834-TR1/TR3	059834-EL1/ITR1	30 uH	1 uF	150 K	27 K	0.47 R	180 K	10 nF	220 R	OPEN
28" GOLDSTAR	056428-GS1	W66QBD240X11	140 V	1.5 nF	13.1 nF	19 nF	2.2 R	3.3 R	1.5 R	RGP 30K	058834-TR1/TR3	059834-EL1/ITR1	39 uH	820 nF	150 K	33 K	0.47 R	180 K	10 nF	220 R	OPEN
28" PHILIPS	056428-PH2	W66ECK001X13	138 V	1 nF	12 nF	19 nF	2.7 R	3.3 R	3.3 R	RGP 30K	058834-TR1/TR3	059834-EL1/ITR1	39 uH	750 nF	150 K	27 K	0.47 R	180 K	10 nF	220 R	OPEN
28" VIDEOCOLOR	056428-VC2	W66EJY011X101	140 V	1 nF	13.1 nF	19 nF	1.2 R	3.3 R	2.2 R	RGP 30K	058834-TR1/TR3	059834-EL1/ITR1	30 uH	820 nF	150 K	33 K	0.47 R	180 K	22 nF	100 R	OPEN
28" SAMSUNG	056428-SB1	W66QDEB93X286	125 V	1.5 nF	13.1 nF	19 nF	0.47 R	2.7 R	3.3 R	RGP 30K	058834-TR4	059934-EL1/ITR1	39 uH	1 uF	115 K	15 K	Short	180 K	10 nF	220 R	OPEN
28" SAMSUNG	056428-SB2	W66QDEB93X286	125 V	1.5 nF	13.1 nF	19 nF	0.47 R	2.7 R	3.3 R	RGP 30K	058834-TR4	059934-EL1/ITR1	39 uH	1 uF	115 K	15 K	Short	180 K	10 nF	220 R	OPEN
29" SAMSUNG	056329-SB1	A68QC P891X404	125 V	1 nF	13.1 nF	22 nF	0.47 R	3.3 R	1.2 R	RGP 30K	058934-TR1	059934-EL1/ITR1	30 uH	820 nF	115 K	15 K	0.47 R	180 K	10 nF	220 R	OPEN
29" SAMSUNG	056329-SB3	A68QC P891X230	125 V	1 nF	13.1 nF	22 nF	0.47 R	3.3 R	1.2 R	RGP 30K	058934-TR1	059934-EL1/ITR1	30 uH	820 nF	115 K	15 K	0.47 R	180 K	10 nF	220 R	OPEN
32" VIDEOCOLOR	056432-VC2	W76EGV023X015	133 V	1.5 nF	13.1 nF	19 nF	0.1 R	3.3 R	3.3 R	RGP 30K	058234-TR3	059234-EL1/ITR1	30 uH	1 uF	150 K	22 K	0.47 R	180 K	10 nF	220 R	OPEN
32" VIDEOCOLOR	056432-VC5	W76EGV023X015	133 V	1.5 nF	13.1 nF	19 nF	0.1 R	3.3 R	3.3 R	RGP 30K	058234-TR3	059234-EL1/ITR1	30 uH	1 uF	150 K	22 K	0.47 R	180 K	10 nF	220 R	OPEN
32" PANASONIC	056432-PS2	W76EKW10X21	138 V	330 pF	13.1 nF	19 nF	1.5 R	3.3 R	3.3 R	RGP 30K	058234-TR4	059834-TR1	30 uH	560 nF	150 K	27 K	Short	180 K	10 nF	220 R	OPEN
32" PAN.(BUSH)	056432-PS2	W76EKW10X21	138 V	680 pF	13.1 nF	19 nF	0.47 R	3.3 R	3.3 R	RGP 30K	058234-TR4	059834-TR1	30 uH	560 nF	150 K	27 K	Short	180 K	10 nF	220 R	OPEN
32" PHILIPS	056432-PH2	W76EFS031X14 (S.FLAT)	133 V	1.5 nF	13.1 nF	19 nF	0.68 R	3.9 R	2.7 R	RGP 30K	057234-EL2	059834-TR1	30 uH	1 uF	150 K	22 K	0.47 R	180 K	10 nF	220 R	OPEN
33" VIDEOCOLOR	056333-VC1	A80EJA33x96 (WW)	158 V	1.8 nF	11 nF	22 nF	1.5 R	3.3 R	3.3 R	RGP 30K	057334-EL1	059334-EL2	30 uH	880 nF	150 K	15 K	0.47 R	180 K	10 nF	220 R	OPEN
33" VIDEOCOLOR	056333-VC2	A80EJA33x104	158 V	1.8 nF	11 nF	22 nF	1.5 R	3.3 R	3.3 R	RGP 30K	057334-EL1	059334-EL2	30 uH	880 nF	150 K	15 K	0.47 R	180 K	10 nF	220 R	OPEN
33" VIDEOCOLOR	056333-VC3	A80AEJ15x04 IRON	158 V	1.8 nF	11 nF	22 nF	1.5 R	3.3 R	3.3 R	RGP 30K	057334-EL1	059334-EL2	30 uH	880 nF	150 K	15 K	0.47 R	180 K	10 nF	220 R	OPEN
33" VIDEOCOLOR	056333-VC5	A80AEJ15x96	158 V	1.8 nF	11 nF	22 nF	1.5 R	3.3 R	3.3 R	RGP 30K	057334-EL1	059334-EL2	30 uH	880 nF	150 K	15 K	0.47 R	180 K	10 nF	220 R	OPEN
33" VIDEOCOLOR	056333-VC6	A80AEJ10X96	158 V	1.8 nF	11 nF	22 nF	1.5 R	3.3 R	3.3 R	RGP 30K	057334-EL1	059334-EL2	30 uH	880 nF	150 K	15 K	0.47 R	180 K	10 nF	220 R	OPEN
33" GOLDSTAR	056333-GS2	CPT GS A80QCFC340X12	159 V	1.8 nF	12 nF	22 nF	1.5 R	1.5 R	3.3 R	RGP 30K	057334-EL1	059334-EL2	30 uH	1 uF	150 K	15 K	0.47 R	180 K	10 nF	100 R	OPEN
33" GOLDSTAR	056333-GS5	CPT GS A80QCFC340X12	159 V	1.8 nF	12 nF	22 nF	1.5 R	1.5 R	3.3 R	RGP 30K	057334-EL1	059334-EL2	30 uH	1 uF	150 K	15 K	0.47 R	180 K	10 nF	100 R	OPEN

# THE LYON'S DEN



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

**W**elcome everyone to the Lyon's Den. I'm delighted to be writing this column each month in *Television* about my daily experiences with customers.

Hopefully we can share some of our experiences in the trade with each other, have a laugh together or even shed a tear together. In this trade you never know what is just around the corner or who will walk into the shop.

By way of a brief introduction to my business and myself, we are based amid the dreaming spires of Oxford, and are a small family business with two engineers and two office staff. I know the photograph of me does me no justice whatsoever, and when I tell you that I'm only forty years old you may not believe me, but it's true. I've

just had a stressful life that's all. I think it is being in this trade and having four children that must have caused the premature hair loss!

Anyway, I hope you enjoy the column and find some practical value in it also.

#### **A good start, gone bad**

It was a beautiful sunny morning, the sky was crystal clear blue and the sun hung low in the sky. It was one of those days that makes you feel good to be alive. Billy Joel was blaring out of my van speakers and I was singing along to it at the top of my voice. Only one thing ruined it really. It was Monday morning and I was on my way to work. I really hate Mondays, its the day I have to do call outs,





something I can't stand doing. I had two calls for this morning and suspected I was not going to enjoy either. The first one was to a particularly fierce eighty-nine year old rental customer. She had rented an old wooden cabinet Pye television from us for years, the tube had failed and on the previous Friday and we had to replace her beloved Pye for a shiny new Toshiba 21" set. She had called over the weekend to say that she didn't like the colour on her new TV and could we do something about it please before 'it damages my eyesight'.

I arrived at the customer's home at 10AM and nervously rang the doorbell. I have been going to her house for years, but she still makes me show identification before she lets me in and calls the office to find out if I am who I say I am. I finally gained entry into her house. She led me to her living room without saying a word. "Now what seems to be the problem?" I asked.

"The problem is obvious, it's that thing," she snapped back.

Pointing to her TV she added: "It's just too bright, it hurts my eyes".

"No problem, I'll just turn down the colour for you, it often takes some time getting used to a new set and after your old set I'm sure this picture does seem quite bright, there, that's better isn't it?" I said, as I turned the colour contrast and brightness down. She looked at me as if I was some kind of lunatic, but said nothing and I beat a hasty retreat to the front door, let myself out and took off rapidly to my next call.

At 10.50 I arrived at the next call. Another eighty-year-old spinster. On Friday she had purchased a 29" Philips 100Hz set from us and like the previous customer had rung over the weekend to say she had a problem with it. She answered the door in a flap. "Oh thank goodness you have come please, please take that TV out of my house."

"Whatever is the problem? You seemed really happy with the set

when I put it in for you on Friday."

"Yes, well that was before the news came on, please hurry you must take it out before the one o'clock news."

"Why what happens when the news comes on?" I enquired.

"Oh it's awful the newsreader's eyes just follow me around the room, he stares at me regardless of which chair I sit in".

I was not able to convince her that George Alagiah's eyes were not staring at her personally. However, she had been a good customer over the years, so I took the set away and we refunded her. She would not buy another one from us in case all our sets had 'the same defect'.

On my way back to the workshop the mobile rang. It was the office telling me that the first customer of the day, she with the overly bright TV, had been on to them to say that now, not only was the colour too bright, but the picture was so dark she couldn't even see it and it was all far too curvaceous.

I was really confused now and was beginning to feel like giving-up, I had no idea what she was talking about.

Ten minutes later and I was going through security checks at her front door again and she led me to her living room.

"How could you leave me with a set like that," she barked.

"Well, what is wrong exactly then," I ventured.

"What's wrong? What's wrong? The picture is dark, the colour is bright and it's all curvy," she said.

I put the set into text to check the geometry settings.

"It doesn't look curvy to me I'm afraid," I offered.

"Look I may be nearly ninety, but I'm not stupid young man, of course it's curvy."

She went over to the set and picked up a photograph of a cat and whilst trying to balance it on the top of the set she said: "It sat beautifully on top of my old TV, it had a flat top you see, and I fail to see how pressing buttons on that flicker is going to alter this awful silver surround."

Yep you've guessed it, she was complaining about the colour and shape of the cabinet, not about the picture at all. I promised her I would do everything I could to sort out the problem, I did return later, but that saga is for a later column.

From top:

■ A. D Lyon

■ Part of A. D Lyon's Visiontech storeroom

■ One customer was alarmed to discover her new set allowed BBC news presenter George Alagiah's eyes to follow her around the room

# TOOLS of the trade

## Testing times in consumer electronics

For those whose work involves servicing equipment in the consumer electronics sector, the key to profitability, efficiency and safety is to use the best possible test equipment. But what should you choose? Mark Hadley of Megger, supplier of probably the world's most famous multimeter, the AVO Model 8, offers a few suggestions.

If you work in the service business, particularly if you're over 30, you've probably either owned or lusted after an AVO Model 8 which was, for many years, the undisputed king of multimeters. If so, you may be interested to know that they're still in production! Small quantities are made every year to satisfy those very few users whose needs are best addressed by what is now, in all honesty, sophisticated, but rather dated analogue measuring technology.

Should you decide that you fall into this category you will, however, need rather deep pockets. A new AVO 8, currently the Mark 7 model, will set you back around £600. If that sounds a lot, bear in mind that high quality precision analogue instruments have always been costly to produce, and that they are not amenable to modern mass production methods.

In truth, if you are a service engineer investing in new test equipment, an AVO8 is not the product I would recommend. It is, however, instructive to look at the roots of its enduring popularity. One factor, I would suggest, is its durability. After decades of far from gentle treatment, thousands, if not tens of thousands, of these redoubtable instruments are still in regular use.

Another factor is ergonomics. The selector switches are clearly marked, and they click firmly into place. The large scale is easy to read and it incorporates a mirror behind the pointer to assist in taking accurate readings. In addition, the instrument is inherently accurate, and it retains its accuracy over long periods.

Finally, the AVO8 is a safe instrument to use. The latest versions comply with requirements for Category III use at 500V AC, of which more later. While this is not necessarily true of older instruments, the chances of sustaining injury as a result of using an AVO8 have always been remote except, perhaps, for those unlucky enough to have dropped one on their foot!

### Up to date

Since the AVO8 was designed, testing requirements have changed, but the basics remain the same. Today's users still want instruments that are reliable, easy to use and safe. Given its history and experience, it's no surprise

that Megger has addressed all of these requirements and more with its current products.

In the multimeter field, these include the M8000 series of dual-display digital instruments. These feature rugged construction with wrap-around rubberised holsters for additional protection, as well as a single function selector switch which is colour coded for ease of use. Naturally, they comply with relevant safety standards and are suitable for Category III applications at up to 1,000V.

Many engineers miss the convenience of analogue meters where useful information could often be gained just by seeing the pointer flick, or noting how quickly it travelled across the scale. Purely digital meters don't offer this convenience, but the M8000 and other dual display models in the Megger range certainly do. In addition to the usual digital readout, they incorporate a special form of bar graph which is every bit as responsive as the pointer in a traditional instrument.

The M8000 series of advanced analogue/digital multimeters from Megger provide comprehensive measuring features in a hand held

The MMC850 can be used anywhere where engineers want to measure current without breaking a circuit or splitting cables





Modern digital meters, of course, do things which would never have been possible for analogue types. The M8000, for example, measures true RMS voltages even for non-sinusoidal waveforms, and when a DC offset is superimposed on an AC voltage. It also measures frequency, capacitance and conductance as well as having a diode-test feature. In addition, the data capture and storage features are invaluable when working on intermittent faults.

While the M8000 is a worthy top-of-the-range successor to the AVO8, there are many other multimeters in the Megger range which are available at lower prices and which offer the same ruggedness, ease of use and safety for users whose requirements are not quite so wide ranging.

### Category ratings

Now let's return to a point mentioned earlier – category ratings for instruments. What exactly do these mean? The answer is that the categories are defined by the IEC 1010 standard, and relate to the instrument's ability to handle supply transients.

Every mains supply has transients superimposed on it; a distant lightning strike, for example, can produce a transient of several kV. Typically, the transient only lasts for a few tens of microseconds and, in itself, it is likely to do little damage. It may, however, initiate an arc which presents a low impedance path for current from the mains supply.

Often, that supply can deliver 1,000A or more until the protective device operates. In that time, the amount of energy liberated by the arc is easily enough to start a fire or even cause an explosion. If the arc is within a test instrument that was in use when the transient occurred, the user may well be injured.

The energy available to the arc is highest where the supply enters the building and only instruments with a Category IV rating are suitable for use at this point. After the supply has passed through the consumer unit, energy levels are lower, and Category III instruments are suitable. After the socket outlet, the requirements fall again to Category II.

Category I instruments are rarely offered by major suppliers and are only appropriate for use within equipment like a television set, where the available energy levels are comparatively low. In practice, most service engineers should choose Category III instruments, as they will allow them to carry out safely all aspects of testing they're likely to become involved with, including tracing supply faults back to the consumer unit.

These days, multimeters are only a part of the service engineer's testing armoury. Many other useful options are available, and among the more interesting are clamp meters. These allow current measurements to be taken quickly without the need to break connections, which not only speeds up testing but also enhances safety.

Unfortunately, conventional clamp testers can only measure the current in a single wire – put them round a three-core mains lead and the reading, if any, is meaningless. But, if it's necessary to split the cores out of the lead to take a measurement, the advantages of using a clamp meter are greatly reduced.

Some rather cunning technology provides the solution. The key is to equip the clamp with an array of planar sensing coils rather than the single coil used in

conventional clamp meters. Each of the planar coils sees a slightly different magnetic field, because of its different location with respect to the cable cores.

With a knowledge of the cable geometry – which is very similar for most commonly used types of mains cable – the small differences in the signals from the coils can be used to calculate accurately the current flowing in the cable. This new technology is used in Megger's latest MMC850 clamp tester, which is ideal for quickly checking the current consumption of all types of domestic appliance.

In this short article it has been possible only to look at a few of service engineers' test requirements. Hopefully, however, enough has been said to establish the benefits of buying robust, safe and easy-to-use products from a dependable supplier with an established reputation.

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## Product up-date

### New Metrix 20MHz synthesised function generator

The ORX-350 is latest addition to the range of signal generators available from Metrix Electronics. This new model is an economically priced programmable function generator producing standard synthesised or user-defined arbitrary waveforms. The company says the ORX-350 features an easy-to-use parameter setting menu and detailed graphic LCD screen that are similar to the higher specification models in the range.

A full range of operating modes includes: continuous, triggered, gated and burst. Triggering can be internal, external or manual. All waveforms are internally generated with crystal controlled sampling rates up to 50MHz, 12-bit vertical resolution and up to 1,000 points. Output levels are up to 10Vp-p into 50Ω, with optional programmable level offsets.

The standard built-in waveforms are: sine and square from 0.01Hz to 20MHz, plus triangle, ramps and pulses. Internal or external, AM or FM modulation and linear or log sweep modes are also available. Wave-X arbitrary waveform editing software allows the user to create, edit and download complex waveforms from a PC to the generator's flash memory.

The model ORX-350 can be remotely controlled by the built-in RS-232C interface. All parameters, modes and functions are programmable. Adaptor kits are available to rack mount the bench instrument cases.

The ORX-350 20MHz synthesised function generator from Metrix



# Aerial testing with PROMAX



After the initial introductions are over, the television aerial installer will disappear onto the roof top where he performs technological miracles or maybe performs massive deception. We have all seen *Rogue Traders* on television, well at least those who have a decent aerial installation, and so the need to equip installers with the knowledge and the tools they need to do the job and build a good reputation into the sector has never been more important. There lies the point of this article. In light of the switch to digital it has never been more important for installers to be professionally qualified and professionally equipped.

A significant step forward towards having more qualified installers has been the introduction of a government initiative by way of the Registered Digital Installer (RDI-LB) initiative. Structured training courses are now being offered by a number of colleges. It means that at the end of the course students can emerge with a NVQ certificates, this being a major step towards them being able to wear and



Don Stoddart of Alban Electronics takes a look at some of the challenges and solutions facing the modern installer

display with pride the 'Digital Tick' logo. (For more information on the RDI courses visit [www.rdi-lb.tv](http://www.rdi-lb.tv))

Installers are now encouraged to use a calibrated signal level meter. The plan is that in future all installers should be so qualified. They, by promoting their 'Digital Tick' ownership will clearly show they are a bone-fide aerial installer. Courses are also being run by other organisations such as the CAI and IDSC and companies like ourselves, but to my understanding only the RDI-LB can register the installer and issue the 'Digital Tick'. For a TV aerial or a satellite TV dish to be correctly aligned, the installer must have a signal level meter. Putting up an aerial for analogue has all too often been a case of 'point the aerial in the same direction as the others in the street'.

## Acquiring the knowledge

The installer will only be able to deal with the more tricky jobs by applying his



better understanding and making digital television measurements with his meter.

So, what are the main and essential measurement parameters now being taught to and required to be fully understood by installers?

Channel Power (CHP) expressed in dB $\mu$ V, Carrier-to-Noise stated in dB (automatic, C/N auto or referenced, C/N

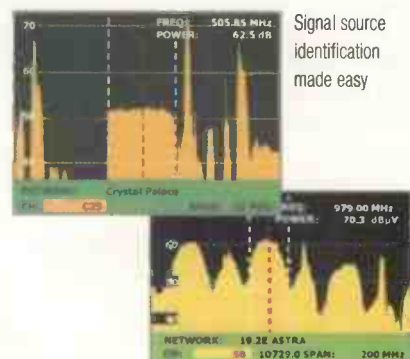
ref) Bit-Error-Ratio (BER), numeric values (before CBER and after viterbi VBER) Modulation Error Ratio (MER) in dB, Noise Margin (NM) expressed in dB.

Measurement of VBER, MER and NM are essential to determine if the digital signal is any where near the point at which the viewer will experience annoying picture break up or pixilation.

For installers who want to walk away with complete confidence in the quality of their work, measurement and recording of these parameters is essential. However, to be clear, the other parameters are also important for without them being correct the VBER, MER and NM will not meet the required standard.

The spectrum analyser section will also show signal modulation characteristics, transmitter channel plans, satellite transponder signatures, inter-modulation, interference, spectrum density, flatness in response within a multiplex or across the entire band.

The analyser should also have the capability of identifying the transmitter or satellite transponder, ensuring the aerial or dish is aligned to the required source of the broadcast. It is also possible to display the programmes contained within the multiplex or transponder and to select the MPEG-2 decoder mode to view the free-to-air (FTA) pictures. Without doubt, when installers first embark into the field of





# High definition today and tomorrow

Ian Sharp, president for EMEA and APAC at Pace Micro Technology looks at some of the issues surrounding the growth in High Definition (HD) TV sales and broadcast role-out

If you go into any high street electronics store or department today, you can guarantee that there will be one item dominating the shelves: HD-ready TVs. It seems the whole consumer electronics world has gone HD crazy. From plasma screens to DLPs to LCDs, manufacturers from across the globe are showcasing their latest HD displays.

Although it has only been a year since HD-Ready TVs really started to hit the market, 1.6 million HD-ready sets have already been sold in the UK alone. When the final figures for 2006 come in this could be as high as 2.4 million – that accounts for 9.6% of all UK households.

One of the key reasons why consumer demand has been so high, was the rush in the first half of the year to upgrade to HD to be able to experience the FIFA World Cup in HD. The retail industry saw a fast build-up to this sporting event with major pushes from UK operators BSKyB and ntl:Telewest to launch HD services in time.

BSkyB reportedly now has around 100,000 HD customers. Telewest HD customer numbers are also doing well, with around 40,000 subscribers. Also with ntl customers on target for a full HD rollout early next year following the successful pilot in Glasgow and Teesside, we are likely to see HD figures growing steadily.

The FIFA World Cup demonstrated how powerful content is in convincing consumers to make the switch to HD. Next year we will see the Rugby World Cup coming through in HD, followed by the Beijing Olympics in 2008. Operators are also launching film channels, documentary series and dramas – such as *Robin Hood* and *Torchwood* by the BBC.

So far, however, this is all available via satellite and cable alone. HD over terrestrial is still a long way off. Trials have been taking place in London for delivering HD over DTT, but this won't be an answer for the short-term. Until full analogue switch off in 2011, the spectrum simply isn't available.

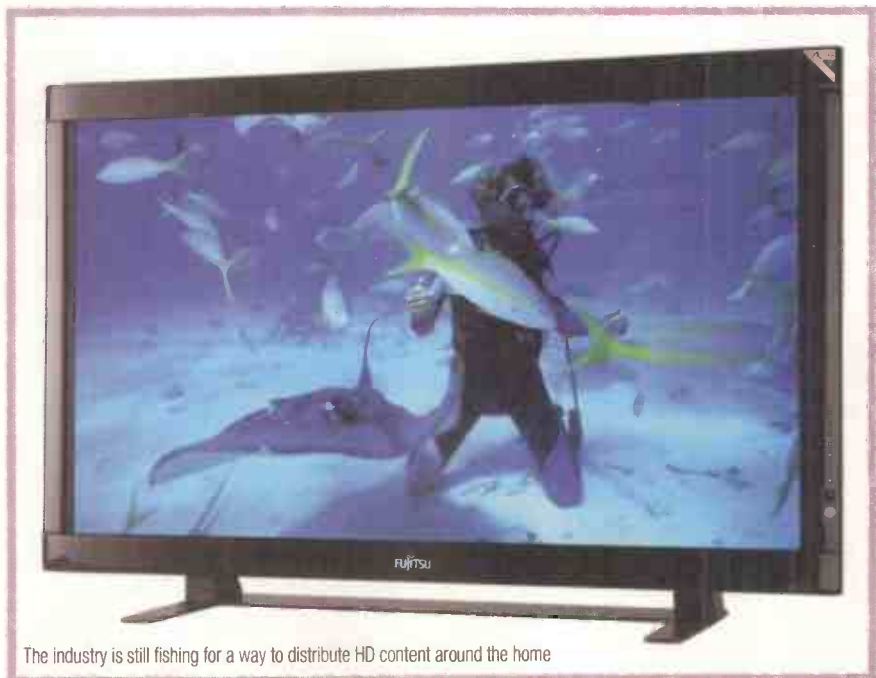
So what will analogue switch off mean for HD in the UK. First of all, it will force consumers to sit up and pay

attention. They will need to think about what they currently get out of their TV viewing, decide what they would like to be able to do, and then, most importantly, take action.

In other words, digital switch over will be a key motivator for people to shift to HD. If they know they have to go digital, this is an opportunity to reassess their entire home entertainment set-up. A key element of this will be the TV set. With increasingly lower pricing and widespread availability of HD sets, these are becoming one of the most popular type of screens bought today. Latest figures show that more than 90% of large LCD screens (26" and higher), as well as nearly 82% of all plasma screens, are HD-Ready. With sales of these flat screens fast increasing (research shows that sales of flat TVs grew by 83% between July and August 2006 while CRT sales fell by 40%), this means HD-ready TV sets are fast making inroads into the living room.

## Multi-room dilemma

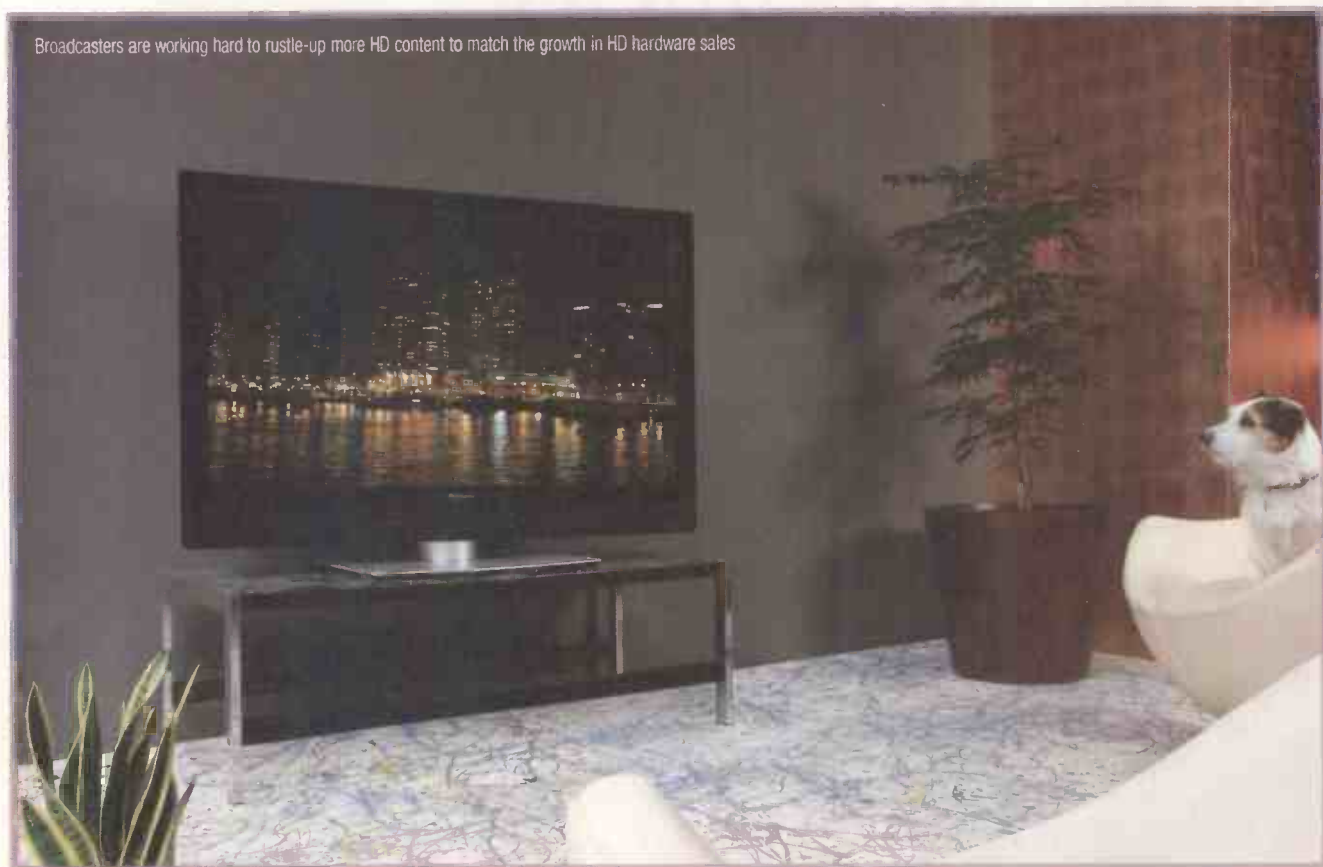
However, buying an HD-ready screen does not mean that consumers will automatically upgrade to an HD



The industry is still fishing for a way to distribute HD content around the home

## High definition today and tomorrow

Broadcasters are working hard to rustle-up more HD content to match the growth in HD hardware sales



service. Analogue switch off will prompt more than a simple decision to go from SD to HD. Households with more than one TV for instance, will have a dilemma to face. To upgrade to digital they will have to upgrade each TV with a separate Set-Top-Box (STB). Another option, and one that we are just starting to see coming through in the market, will be to deploy a multi-room solution where the main STB acts as a server and connects to the other TVs in each room using 'thin clients'. At present, this is only a Freeview solution as the issues are not yet resolved around distributing payTV content away from the main STB.

A home media server is particularly important if the consumer wants to be able to store programming digitally via a personal video recorder (PVR). For instance, if the main STB in the living room is an HD-PVR, the consumer is likely to want to be able to access the content stored on this box elsewhere in the home. The alternative (a separate PVR in each room) is likely to be troublesome and unwieldy for the average family. The 'simple' solution is therefore to network all the units together. However, Pace is working hard to resolve the current limitations and lead the way in 'whole home TV distribution'.

The concept of having a server in the home is a compelling one, but complicated.

The best methods for distributing content around the home have also not yet been agreed on. There are a number of options open to enable this.

MOCA (Multimedia Over Coax Alliance) is a wired solution that requires coax to the home, making it ultimately suitable for the UK, especially for larger homes as bandwidth can be guaranteed.

HPNA sends video and other data via the telephone line. The HPNA is currently standardising this solution. The drawbacks are that the bandwidth is not guaranteed and can vary.

Home Plug is a solution from the Powerline Alliance that runs information along the home electric circuits. The drawbacks include 'noise' from electrical appliances which can cause latency, a problem with high-speed data and video.

Rather than installing more wires in the home, most consumers would prefer a wireless solution. Wi-Fi is one solution that many are considering. The problem with this is that Wi-Fi transmitted video is considered to be unsuitable from a quality of service point of view. There are also issues

around interference, required bandwidth and difficulties in keeping networks private.

This holds true for most other wireless 'solutions' for now, though, in the longer term, wireless is expected to be the distribution method of choice, and there are some developments already underway to develop wireless technologies that combat the problems mentioned above.

But that is still some way off. Until then, we will continue to see consumers making the switch to HD in force. The industry is behind this technology and, as more content becomes available from broadcasters as well as from other sources such as HD-DVD players and next-generation games consoles, consumer demand will steadily grow.

How consumers will enjoy, share and store HD content is still uncertain. With so many choices and options available to them – both immediately and in planning ahead for the future – it is with installers to advise on the best course of action. One thing for sure is that HD is here to stay and we expect there to be some really exciting developments over the coming years that will transform the way we consume home entertainment.



# The **TIMES** they are a **CHANGING**

Panasonic has carried out some research to find out how Television viewing habits are shaping attitudes towards plasma product purchasing

**P**anasonic says these are changing times when it comes to how and what UK consumers are watching on their TVs. Through some independent consumer research, the company has explored the relationship between the large screen plasma and the viewer, looking at what effect this has had on what people watch, through to the social dynamics of how viewers watch TV.

The company has also explored changing habits and attitudes to that perennial domestic battle ground of who is in charge of the remote control.

#### **Viewer profiles**

Panasonic recons its research revealed that there are a number of certain types of plasma viewer:

**Plasma planner:** The younger generation is selective about it viewing – 83% of 16-24 year olds schedule their viewing in advance. Of this age group, a quarter also see a large screen TV as a status symbol on the same level as a car.

**Spontaneous browser:** Slightly older viewers tend to be spontaneous browsers – 43% of 25-35 year olds flick through the channels to find out what is on rather than planning their viewing.

**Silver-screen sofa:** Panasonic says its research shows viewers are watching more 'quality' TV, particularly movies. 44% of mothers and 50% of fathers say their plasma screen has had the biggest impact on their enjoyment of movies and over half of 16-24 year olds consider themselves movie buffs.

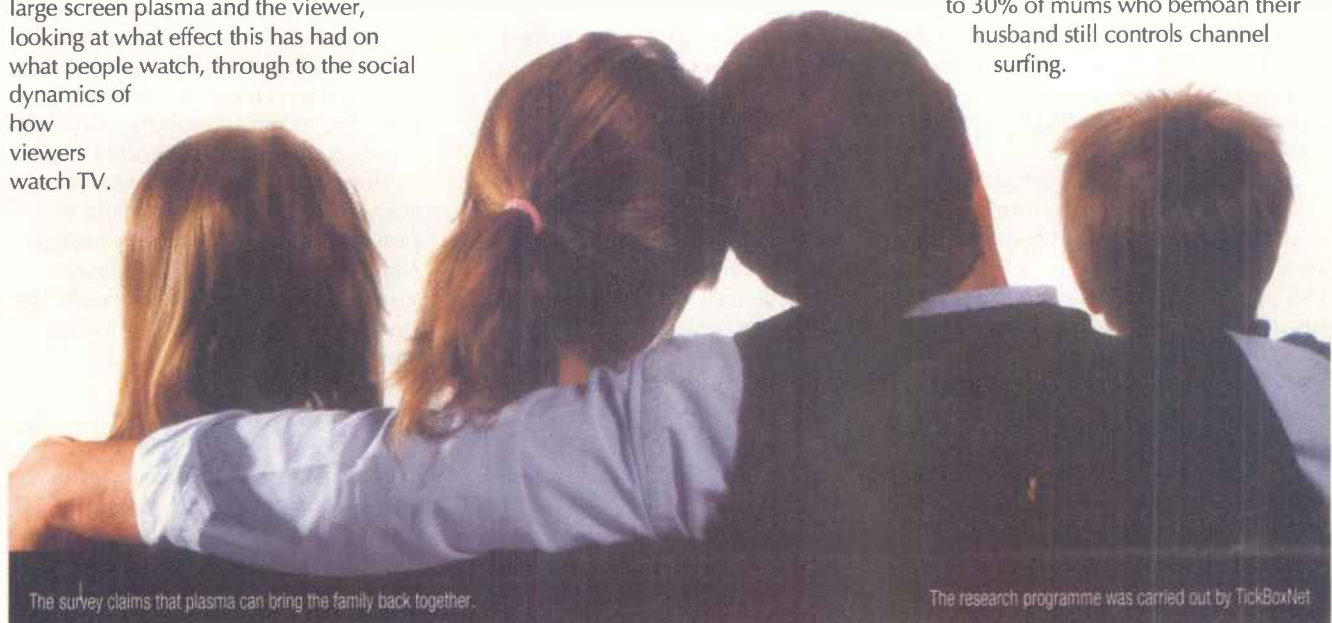
**Social spectators:** Panasonic also argues that plasma screens are making watching the television a social event again. Two-thirds of the 35-45 age group thought that the plasma screen brought the family closer as it meant they were more likely to watch together. Over half of mums found that it made their house a social venue for movies, top shows and sporting events.

**Restless surfer:** Dads remain the main culprits for channel surfing, three times more likely to channel hop than women, despite beginning to share the remote control with their children.

#### **Remote possibilities**

Panasonic also says the research shows that 23% of men and 21% of women admit to being a remote control hog, so ending one of the UK's hardest fought battles of the sexes. However, men and women may have issued a truce over the remote control, but there's a new hog on the horizon – their children.

The research shows that one in five mums (18%) admit their children now dominate the remote control, compared to 30% of mums who bemoan their husband still controls channel surfing.



The survey claims that plasma can bring the family back together.

The research programme was carried out by TickBoxNet

The new control children appear to be having on the nation's remote controls could have something to do with men, who claim to be responsible for more than three quarters of all plasma purchases, and give nearly as much credence to their children's opinions on which new set to buy as their wife's.

Whilst women are ten times as likely to listen to what their husband has to say about a new plasma (51% prioritised their spouse's opinion compared to 5% of their children); men are more even-handed with a wife being considered in just 19% of purchases, compared to 12% for children.

Whilst this may show how important children's opinions are becoming in picking the latest in large screen entertainment, Panasonic says one stereotype, the 'restless surfer', would appear to be holding true. Although, dads are listening to children and tending to share the remote when they do get their hands on the controls, they are three times (23%) as likely to flick aimlessly through channels as women (7%). In fact, this is pronounced in families where almost one in five dads (19%) admit to being restless with the remote, making them four times as likely to flick channels at random as mums (5%).

### Youth TV

Panasonic says that today's 16-24 year olds may have grown up in the multi-channel world of digital television, but the research shows that they are surprisingly adept at planning an evening's entertainment rather than flicking through hundreds of channels.

In fact, the research shows that 83% of 16-24 year olds are 'avid planners' of what they watch, more than double the 28% and 35% of 35-44 and 45-54 year olds. A mere 17% of 16-24 year olds simply sit down and browse a list of channels hoping to find a programme they like, compared to 43% of 25-34 year olds – the spontaneous browsers. Clearly youthful television viewers have strong affinities to which shows they like and know and plan an evening's entertainment.

The company says they are also more than twice as likely as other age groups to love movies. In fact, half consider



Panasonic says the spread of big screen entertainment is breeding a new generation of young movie lovers

themselves movie buffs compared to 19% of 25-34 year olds and 14% of 35-44 year olds. This love of movies and eagerness to plan the night ahead is, however, not affecting their grasp on current affairs. Far from it, 17% of 16-24 year olds admit to being news addicts, roughly the same figures of 25-34 year olds (19%) and 35-44 year olds (14%).

### A family affair

Panasonic argues that the family is being brought back together again by perhaps the most unlikely of sources – the TV. Or, to be more accurate, large screen plasmas. After years of televisions creeping into bedrooms and keeping children occupied for hours on end without ever having to say 'hi' to their parents, the lure of the big screen is getting families back together again driving Britain to become a nation of 'social spectators'.

Nearly two in three people aged between 35-44 years old or 45-54 years old (65% and 64% respectively) claim that a plasma screen has potentially or definitely brought the family closer together. A fact reflected in more than half of mums of all ages (59%) noticing the same effect.

### Quality not quantity

Research for Panasonic also showed plasma screen owners do not watch more television than regular TV owners. Instead large screen TV owners are tending to focus on quality drama and documentaries. However, almost a half of

all plasma owners (49%) find they now watch more quality dramas compared to 39% of regular TV owners. The same is true of documentaries, where 58% of plasma owners now watch more, compared to 53% of regular TV owners.

When it comes to how often, the research found that weekly TV viewing remains very similar for regular TV and plasma owners, with 13% and 11% respectively watching more than 31 hours per week.

Although Britain's couples are happy to watch more quality television together, the battle between his sport and her soaps and reality TV shows no sign of abating.

The research shows that large screen televisions are helping to boost couples' enjoyment of documentaries (more than 50% of both men and women now watch more) and prompting them to agree to turn off game shows (more than two thirds of men and women now watch less).

However, the traditional cause of many a row remains – Love Island and EastEnders or football and more football. A fifth of women are watching more soaps, double the proportion of men. The same is true of sport where 34% of men now watch more compared to 22% of women.

Panasonic says the continued dividing line between his and her television is more pronounced with parents. Whilst mums and dads were agreed that a plasma TV had had the biggest impact on their enjoyment of movies, dads are three times as likely as mothers to cite sport as the TV genre a plasma has had the biggest



# The **TIMES** they are a **CHANGING**

positive impact on their TV viewing as women (42% of dads, compared to 13% of mums).

It appears for dads that although they are watching more documentaries and quality dramas, they get the most added enjoyment from a plasma when watching movies and sport – in fact more than nine in ten are agreed this is the main benefit.

Mums on the other hand are far more even handed and so, although both mums and dads are watching more documentaries and dramas together, mums are four times as likely as their husbands to cite documentaries and three times more likely to cite quality dramas as the main benefit of owning a plasma.

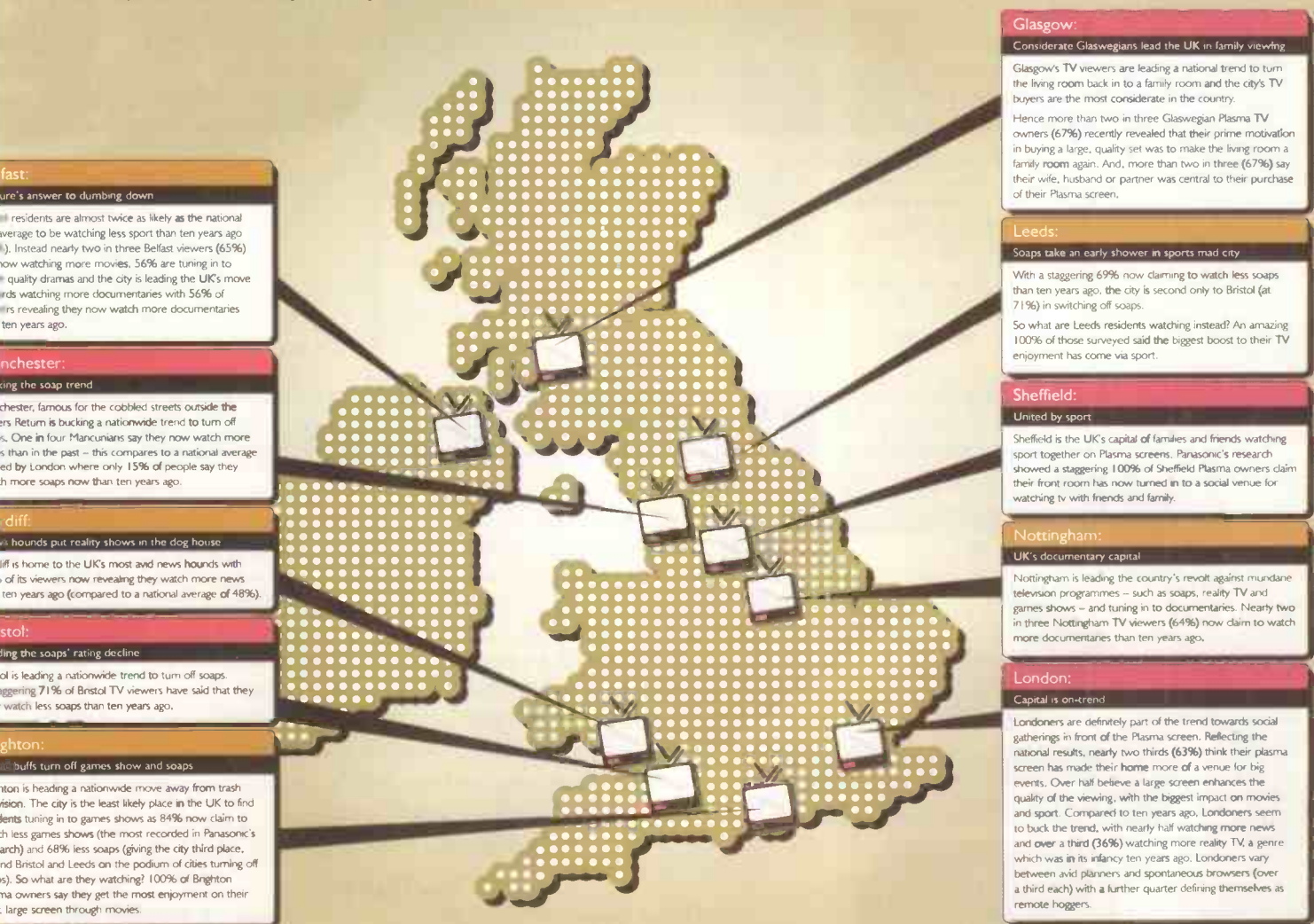
So for mums the appeal of plasma is more widespread, for dads it is literally all about the action of the big screen or the beautiful game.

Improving the TV viewing experience is the number one priority for all plasma owners, although more so for men than women. Nearly three quarters of men (72%) cite improving their TV picture as the main reason for buying a plasma compared to half of women (51%). It is perhaps unsurprising then that 80% of men claimed to have been behind the decision to buy a plasma, whereas almost half of women (48%) left the decision to their husband or partner.

## What Television thinks

If Panasonic's conclusions are correct, this maybe good news for the service industry. If quality large screen entertainment (of course plasma is just one way to achieve this) is indeed becoming an important part of family life, the equipment that is delivering that experience will be valued and is more likely to be repaired or serviced when there is a problem. Quality viewing of course requires quality product and if that is what manufacturers and consumers both want, they will both have to move away from the commodity approach that has dominated in recent times.

The study revealed differences in regional viewing habits



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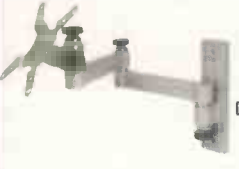
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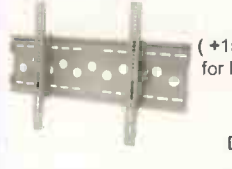
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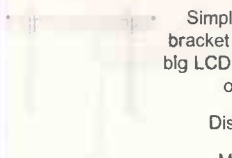
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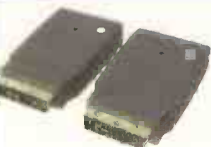
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MC 44608P40 .....	£ 2.50 + vat	TDA 3654Q .....	£ 3.50 + vat
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# DX and Satellite TV

By Roger Bunney

Settled high-pressure weather conditions in early November produced remarkable Tropospheric reception conditions. Here in the South UK from the 6th to the 8th very strong French TV signals dominated the UHF bands, helped in part by thick fog that persisted overnight and daytime. Peter Schubert (Rainham, Essex) also noted improved reception producing excellent Benelux reception in both Band 3 and UHF – by the time this column is read the Dutch analogue national TV channels will have closed down in favour of digital. Cyril Willis (Kings Lynn) enjoyed great successes with Scandinavian, Danish and German reception, including digital DX! And Sporadic E was active morning of October 28 with signals on both chs. R1, R2 and ch.E3 from the East, unfortunately all unidentified.

The publication 'Six News' has printed an article, translated from the Japanese, discussing how 50MHz amateur signals are regularly received over distances of 10,000-12,000km during mid summer. Multiple hop Sporadic E that would need five or six spaced E reflecting clouds and good ground reflecting characteristics along the signal path, is clearly not going to happen. The signal mode is believed not to be based on multi-hop propagation - but Japanese to Europe, North America 2 way contact at 50MHz regularly occurs. Thoughts of perhaps a high level E layer ducting existing may be one reason, this is clearly a new form of signal

propagation which radio amateur Han Higasa (JE1BMJ) calls SSSP – 'Short-path Summer Solstic Propagation'. I hope to discuss this in a future issue when more information is available.

## Satellite sightings

The easterly 'look angle' of my dish just reaches to 57° East and NSS-703, a lonely satellite over Asia and relatively quiet with minimal traffic carriage. A recent check found an increase in throughput activity. 'B-SKY-B' @ 11.510GHz-Vertical (Symbol Rate 2917 + Forward Error Correction 2/3) appears to be the 'NDTV' feeder from a 24/7 Indian TV channel destined for the European/UK Sky platform from the 28.2° East Astra platform, programming running at +5½ hrs GMT. There's also a Bulgarian TV presence on 703 with 'bTV' downlinking @ 12.553GHz-V (99404 + ¾), a commercial TV channel together with several other established TV entertainment offerings.

My most westerly 'look angle' of my dish is now Intelsat 903 @ 34½° West. 8 years ago when arriving at then a newly built estate house next to open space, I could see right down to 60° West but adjacent fast growing bush growth now to nearly 15 feet has masked that direction. Intelsat 903 is another relative quiet satellite – there's an occasional UK/Irish outside broadcast feed (OB) – but a regular client is the Irish TV service RTE. 'RTE LDN HBR' is a London-Dublin feed link @ 11.137GHz-V (5632 + ¾) together with 'RTE SMU3 HBR' @ 11.162GHz-V (3150+5/6), both feeds are usually

encrypted. October 20th included an additional Irish feed, that of 'SDIGISPACE UKI-5??' @ 11.145GHz-V, featuring a football match OB in the 'Eircom Football League', 'Live from the Brandywell'.

But it's the NSS-7 satellite that features a wide range of American Sport particularly at weekends. October 21st and NSS-7 carried live car racing from the 'Laguna Seca Circuit' at Monterey, California in the Le Mans series. The televised action included race coverage, commentary and promotions for the network sponsor, cameras in both the pits and on-board racing cars. The OB was fed over the 'BT Washington' NSS lease @ 11.688GHz-Horizontal (5632+¾). One of our readers expressed interest in the Irish greyhound racing previously reported as seen over Intelsat 10-02 @ 1° West. Greyhounds are usually found around 11.500GHz-V on this sat most nights excluding Sundays, one busy night found 'DOGS' @ 11.505GHz-V (3250+2/3) from the Cork track, together with 11.501GHz-V (3200+ ¾) from the Shelborne Park track using the 'SISLink-17' Eire based truck. Transmissions are in the clear and usually with commentary, I suggest using a 'blind search' receiver between the 11.480-11.520GHz-V spectrum for locating racing activity. Most days will find considerable Scandinavian activity on the sat, football, ice hockey, rugby. Sky Sports [UK] on the 22nd Oct appeared with a Leicester v. Munster scrum (Leicester hammered 16:21) in the Heineken 2006-7 league together with post match interviews. BBC-TV is a frequent 10-02



Also included with the receivers is Sony Digital Cinema Sound EX processing. This is able to re-create the sound of three different sound recording and mixing facilities in the Sony Pictures studios in Culver City, California. Based on measurements made in these facilities, the modes offer a choice between a good all-round everyday processing setting, one best for big action movies and another optimised for music. The processing can even create the impression of a seamless arc of speakers beside and behind the listener, just like at a good movie theatre.

For these new receivers, Sony has designed a complete new digital processing block based around the 32-bit SHARC floating point processor. Sony says this gives greater flexibility and a sound delivered without any sense of strain or artificiality. The top of the range model (STR-DA5200ES) also offers multi-room capability, making it able to send sound and video to a second room and audio to a third. If a 5.1-channel system is being used in the main room, it's also possible to re-assign two amplifier channels to

drive speakers in a second room.

The SCD-XA1200ES SACD/CD player from the range is designed for high-quality playback of both multi-channel and stereo audio discs. The player uses Sony's own Super Audio D/A conversion and disc transport and can be connected to an amplifier via dedicated stereo and multi-channel analogue outputs designed to offer the best performance whatever disc is played. Optical and coaxial digital outputs are also provided for CD playback, and the player uses selected audio components throughout, including a high efficiency, low-interference R-Core transformer for the audio board.

Built to partner the SACD player is the TA-FA1200ES stereo amplifier.

This 100W per channel stereo amplifier is built around Sony's S-Master PRO digital amplification system, present here in its latest fine-tuned 32-bit version. The amp also carries the same Digital Cinema Auto Calibration present on the A/V receivers.

## Denon's fantastic four

Denon has up-dated its range of AVR receivers with a four new models designed to deliver power as well as ease of use.

Denon's design goals for the whole range were to improve audio and video reproduction whilst making the new machines more user-friendly. A new chassis layout and upgraded components take care of the sound. The new Ergo remote takes care of the user, with key controls on the front face and rarely used ones under a cap. The remote also gives all important functions

their own size and shape of button for intuitive control.

A new 32bit Floating Point Digital Signal Processor (DSP) for the range, handles surround processing at 96kHz. Denon says many of its competitors process Dolby PLIIx and DTS Neo:6 at 48kHz. The company says the result of its system is more information and therefore a better audio performance.

All the models in the range are capable of 7.1 sound reproduction. However, Denon argues that most users only ever use 5.1, so higher spec models in the range can use the extra two channels to either bi-amp the front left/right speakers, or to feed stereo sound from any source to another room.

*Denon's AVR receivers come partnered with a new intuitive remote control*



*Top of the range in Denon's new AVR receiver family is the AVR-2307 PR*

The range also features full iPod control. The user's iPod can be connected to the receiver to reproduce both audio and pictures, display track info on the front of the receiver, as well as allowing control of the iPod from the receiver's remote control.

All the models also have a large heat sink made of extruded aluminium. The heat sink is placed in a design that Denon says ensures uniform temperatures throughout. This ensures that the output transistors are driven under uniform conditions. This in turn ensures that all channels respond with equal performance.

Also included across the range is Denon's Twin Drive Rectifier design. This uses two rectifying diodes in parallel to bring out the maximum potential from the large transformer. Denon says the rectifiers power the large block capacitors at low impedance and are able to supply ample current to reproduce deep bass, as well as sudden bursts of sound from percussion or effects.

The range consists of the entry level AVR-1507 PR, middle ranking AVR-1707 PR, step-up AVR-1907 PR and the top of the range AVR-2307 PR.

## The Domino effect

Sim2 asks the not un-reasonable question, 'why splurge on new high definition hardware if you then only use a scrawny 42" screen?' The company argues that what is really needed to appreciate the full impact of HD-DVD and Blu-ray is a projector that displays movies in true, uncompressed, 1080p high definition.

Sim2's latest model, the Domino D80, offers what the company says is an incredible 1080p performance at a 'highly competitive' £7,000 price point.

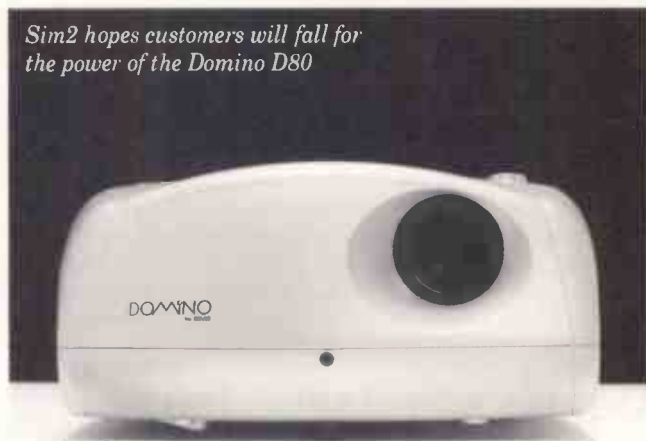
Some may wince at such a price tag, but judging by the amount of these 'enthusiast' projectors now available, there is an increasingly healthy market for these types of products.

Sim2 says the D80 offers new levels of cinematic realism in single chip projection by employing a single Texas Instruments 0.95" 1080p DarkChip3 DMD chipset and full 10-bit end-to-end processing. The maker says this allows the unit to display the full resolution of even the most demanding video materials. The model also features a long-life, high-output 160W lamp, SIM2's ALPHA PATH proprietary light engine, a new seven-segment colour wheel, and a contrast ratio of 4000:1.

Sim2 says a de-interlacer and scaling engine developed exclusively for the company ensures optimal performance with any source material, high or standard definition.

The D80 projector is available in either Black Shadow or White Evolution cabinet colour.

*Sim2 hopes customers will fall for the power of the Domino D80*



## Marantz has music in its heart

Marantz reconns its new 7.1 home cinema receiver with HDMI video switching and video up-conversion, has all the latest video technologies, but still has music at its heart.

The company says, despite its £480 price tag, the new SR5001 is a high-performance, high-power home theatre receiver that offers the very best surround sound reproduction.

The machine offers HDMI video switching, video up-conversion on analogue signals, 192kHz/24-bit audio DACs as well as 32-bit digital signal processing of Dolby Digital EX, DTS-ES, DPL IIx, CSII, DTS 96/24 and Dolby Headphone. Marantz also says that, even from a conservative point of view, the machine can deliver 90 Watts across each of its seven channels.

The SR5001 incorporates two HDMI inputs and one out with video switching, all compatible with 720p, 1080i and 1080p signals. There are also three Component ins and two outs, which are assignable.

*The SR5001 from Marantz packs a punch for a modest price point*



Meanwhile, to ensure the highest quality video images from all sources, the receiver's video section features Composite/S-Video-to-Component video up-conversion.

Marantz always prides itself on achieving the best in audio reproduction, consequently the company says that the power amplifier section in the SR5001 uses a huge transformer with high current discrete output on all channels, designed to deliver continuously clean and stable power. There's also a Pure Direct mode which turns off high noise video components and the display, which can both cause interference.

In addition, Marantz has focused on flexibility by utilising Flasher In, IR Emitter Out, DC trigger out and a RS-232C communication port, so the SR5001 is suitable as a custom installation solution. A multi-zone function is included complete with component video signals. It is also possible to assign the surround back channel for use as a multi room speaker driver.

The SR5001 has also been designed to be simple to set-up thanks to what is described as a clear on-screen display menu and easy set-up guide function. Marantz's HT-EQ Home Theatre Equalizer circuit compensates for what the company feels is the overly bright sound quality of some DVD movie soundtracks, that were not properly re-equalised for the home listening environment, yielding a more natural sonic presentation. Completing the package is a programmable learning remote control.



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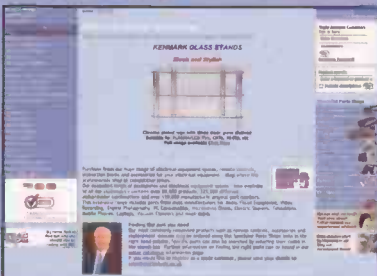


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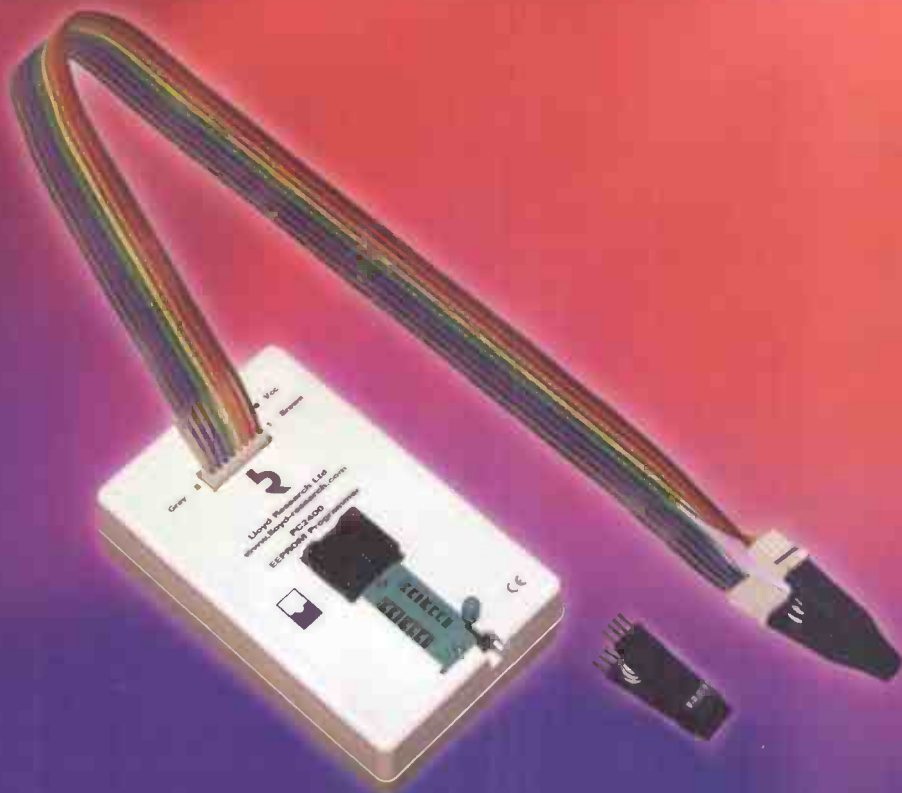
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# PC2400 I<sup>2</sup>C FIELD SERVICE PROGRAMMER



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A special lead with clips for DIL and SO parts is provided for in-circuit programming.

### • USB CONNECTIVITY

Works with modern PCs which do not have RS232 or Centronics ports

### • PROGRAMS NVM 24CXX EEPROMs

Also programs other I<sup>2</sup>C parts

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

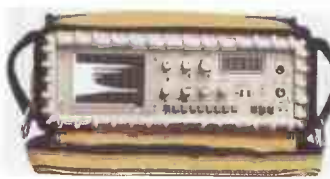
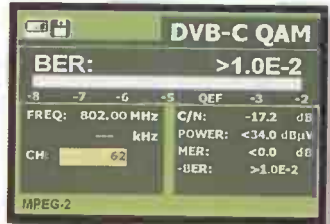
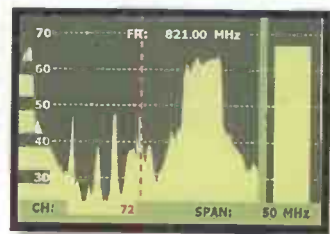
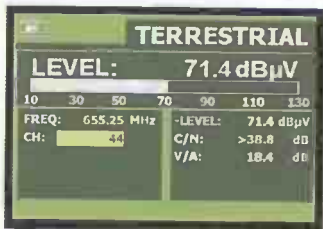
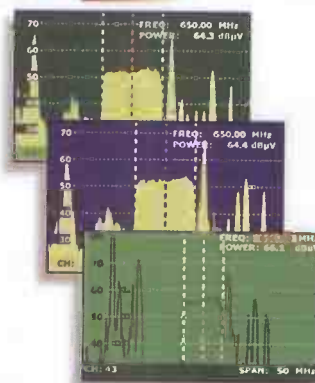
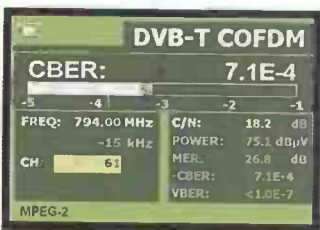
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