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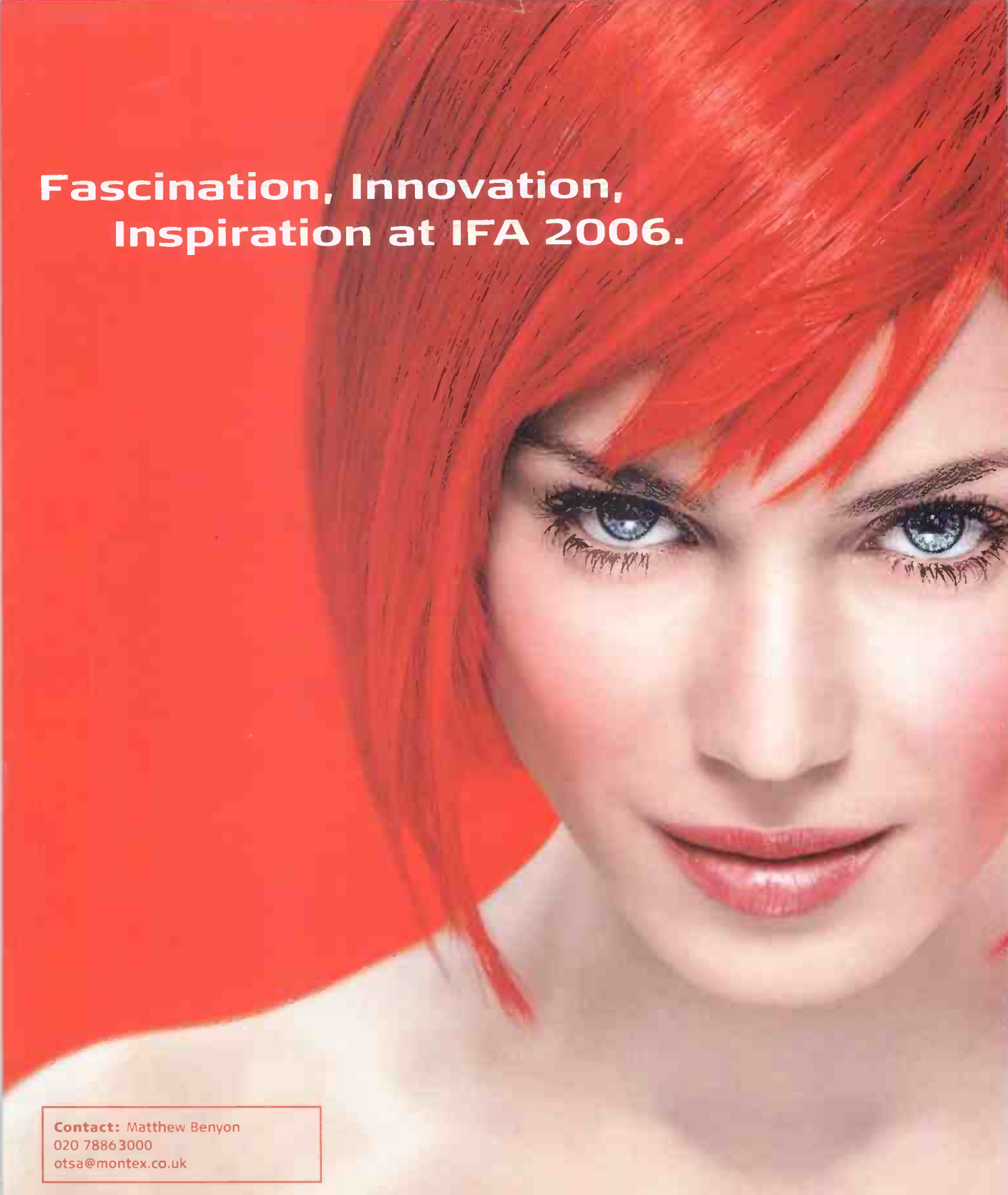

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NEXUS
MEDIA COMMUNICATIONS

A NEW BEGINNING

I would like first to briefly introduce myself as the new editor of Television and Consumer Electronics magazine. Although new to this grand old publication, I have been writing about the consumer electronics industry for many years now and I am really looking forward to overseeing the next stage in the life of this important publication.

One hundred years ago, on December 24, 1906, American broadcast pioneer Reginald Aubrey Fessenden, sent the world's first transmission of voice and music to multiple recipients. The event marked the beginning of the broadcast age. Not far behind, in 1934, *Television* magazine was born, first published as *Practical Television* and then as a regular supplement in *Practical Wireless.*

Ever since then the magazine has been an integral part of the industry, providing engineers and industry bodies with a vital platform to share information and air their views from.

With the shift towards digital technology, there are undoubted challenges facing the world of servicing and repair, and it is tempting to look back to a time when things seemed to be better. However, *Television* magazine does not just have a great history but also a great future. I am certain that the magazine and its readers can continue to form a vital part of the foundations of this successful business.

Over the coming months we will keep readers up to date not only with the latest news, but also we'll introduce features that will showcase new streams of income that the switched-on engineer can explore.

There is certainly a lot to keep up with in terms of new technologies. This month alone we bring you news on new magnetic chips, the next stages of the high-definition interface HDMI and the latest MicroSD cards.

However, the more things change, the more they stay the same. One hundred years after Fessenden's broadcast, wireless technologies are again the buzzword of the industry and the public, and now more than ever we need forward-thinking engineers.

Of course, to achieve this, your input is vital. Please tell us your likes and dislikes of the magazine, as well as send us your views of the industry and its future. Remember, it is your magazine and we are only a phone call or email away.

Daniel J Sait
Editor

This 71PY10 LG plasma screen is coated in four pounds of 24-Karat gold – I kid you not! Like LG, Television magazine will be working with its readers to create a new golden age for engineers

The next step in HDMI

A new version of the High Definition Multimedia Interface (HDMI) for connecting consumer electronic devices has just been launched. HDMI version 1.3 will enable the next generation of HDTV sets, PCs and DVD players to transmit and display content in billions of colours. The colour depth is now higher at 30-bit, 36-bit and 48-bit (RGB or YCbCr), up from the 24-bit depth in previous versions of HDMI. HDMI 1.3 covers xvYCC, which supports 1.8 times as many colours as existing HDTV signals, whilst eliminating on-screen colour banding. The bandwidth has also now doubled from 165MHz, or 4.95Gbit/s, to 340MHz, or 10.2Gbit/s.

There is also a mini connector which allows easier integration of the interface in portable devices, such as digital still cameras and camcorders.

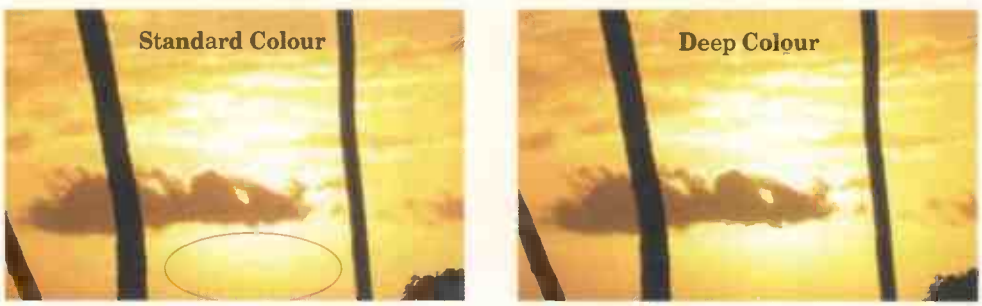
HDMI has a bi-directional route, allowing certain intelligence to be built into it.

Leslie Chard, president of the HDMI Licensing, the agent body responsible for licensing the HDMI specification, said: "The interface will no longer be a constraining pipe that forces all content to fit within a limited set of colours, unlike all previous video interfaces."

Products implementing the new HDMI specification will continue to be backward compatible with earlier HDMI products.

The seven HDMI founder companies are Hitachi, Matsushita, Philips, Silicon Image, Sony, Thomson and Toshiba.

HDMI version 1.3 combats colour banding



HDMI connections set to rise

More consumer electronics products are likely to include HDMI video ports as the HDMI Licensing body has reduced by 30% the annual admin fee it charges to manufacturers (down from £8,000 to about £5,400).

HDMI Licensing reported that the cut was made possible by the success of the technology, but some analysts are suggesting that the move was also designed to encourage more Chinese manufacturers to start including HDMI.

Reducing licensing charges may encourage more manufacturers to include HDMI. Like Sim2's impressive Domino 45

The Chinese market has complained that adopting standards developed in the west is too expensive because of the royalties it has to pay to get access to the technology. The risk is that Chinese makers will seek to develop cheaper alternatives or even connection systems of their own. The massive size of the potential market in China, means the technology's backers are keen to keep the Chinese on board.

The fee reduction will apply to HDMI annual fee payments that are due after November 1 2006.

Fairchild Semiconductor introduces its new baby

Fairchild Semiconductor is one of the latest IC suppliers to announce a new generation of operational amplifiers aimed at the video market.

David Fry, market development manager for consumer systems at Fairchild Semiconductor said: "Set-top boxes are ramping up, LCD and plasma screens are increasing (in unit sales). I don't see any of these (curves) flattening at least until 2010 and we are focusing on picking up new designs."

He added: "The (high) volumes are in consumer electronics now, just like they used to be in telecoms, PCs and mobile communications. These consumer applications are the first markets we will be focusing on with our new video amplifiers."

Fairchild wants to grab a big share of the amplifier sector and has developed a new semiconductor process for high-speed analogue devices such as video amplifiers, drivers, multiplexers and cross-point switches. The process is 6th generation BiCMOS, where vertical NPN and PNP transistors have a matched fT of 8.5GHz for high speed.

The new device family consists of single, dual and quad high-speed 2.5V to 12V, rail-to-rail amplifiers – the FHP3130/3230/3430 – suitable for standard definition television applications, and triple and quad voltage feedback amplifiers – the FHP3350/3450 – suitable for high-definition TV, even the 1080i/1080p standard.

Renesas offers digital TV processing

The Renesas SH-MobileL3V processor

Offering what the company describes as excellent video processing capability at lower cost, Renesas' SH-MobileL3V processor is designed specifically for use in terrestrial digital broadcast capable mobile phones.

The processor is designed to deliver smooth video display as well as facilitating the extraction of TV broadcast data and conversion to a JPEG image without loss of image quality. Renesas says SH-MobileL3V also enables lower power consumption and provides the ability to customise mobile phone features.

The maker says that the SH-MobileL3V supports systems such as DVB-H in Europe, DMB in South Korea, and one-segment broadcasting in Japan. Moreover, since the device's VPU4 (Video Processing Unit 4) can also handle MPEG-4 processing, the SH-MobileL3V can implement a variety of moving image applications such as video mail, video phones, and video clips.

The SH-MobileL3V incorporates a VPU4 high-performance video processing IP. The VPU4 supports both the H.264 video compression standard used for digital broadcasting services, and the MPEG-4 standard used up to now for video, video telephony and similar applications. The VPU4 performs almost all video processing by hardware, consequently, the CPU can execute other processing while the VPU4 is processing H.264-format video data, enabling the frequency to be kept low, and thus making it possible to achieve lower power consumption.

Playstation 3 may delay Blu-ray development

Reports have cast doubt over the availability of blu-ray diodes

According to Chinese-language newspaper the Commercial Times, the ramping-up of production for the PS3 may cause a shortage of the diodes used to generate the blue-light lasers needed for Blu-ray technology.

If the report is to be believed, supply of these diodes is tight as yields have not been as high as hoped and both Sony and Nichia (the world's only suppliers of the parts) are affected by the same technological teething-troubles that are preventing large enough numbers of the diodes coming to market.

Sony needs the diodes for the read-only drives essential for use in the PS3 and it has to balance supply with orders from other drive makers. The implication is that at this time there may not be enough laser diodes to go round.

However, Jonathon Fargher, senior PR manager for the PS3 in the UK told *Television* that the player was still set for a pan-European and north American launch date of November 17th with the PS3 due to appear on the Japanese market on November 11th. Farher said: "As far as we are concerned there is no knock on effect and the launch for the PS3 is still very much on track."

Samsung and Sony agree new 8th generation LCD plant

Under the joint venture name of S-LCD, Samsung Electronics and Sony, have signed a Memorandum Of Agreement (MOA) with Korea's Chungcheongnam-do province which includes the construction of an 8th generation LCD production line.

In the signing ceremony, Chungcheongnam-do Provincial Governor Lee WanKoo, Asan city Mayor Kang Hee-bok, S-LCD CEO Chang Wonkie, and CFO Hitomi Masatoshi, jointly announced the details of the MOA, which covers new investment by S-LCD and infrastructure support by the local government.

According to the contract, S-LCD has agreed to invest a total of US$1.9 billion (£1 billion approx) by the end of 2007 to build an 8th generation LCD production line. It will be located on the site next to the existing Line 7 in the Tangjeong Crystal Valley. Chungcheongnam-do and Asan City have agreed to designate the location where S-LCD is making the new investment as a 'foreign investment zone'. The local government has also promised to support the project with various incentives.

The overall Tangjeong Crystal Valley complex is scheduled for completion by 2015. By that time annual output is projected to be worth $30 billion (£16 billion approx) with exports of US$24 billion a year (£13 billion approx) and jobs for 50,000 workers.

Local officials and S-LCD executives agree plant deal

Texas Instruments launches audio DSP

TI's TAS3108 DSP can handle 7.1-channel processing

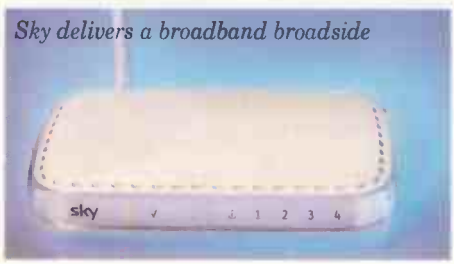
Texas Instruments (TI) has delivered what it describes as a low-cost, high-performance audio digital signal processor (DSP) for home and car applications. TI says the 8-channel TAS3108 audio DSP brings high-performance audio processing capabilities to enable up to 7.1-channel processing in digital TVs and one-box home theatre systems.

The maker says the TAS3108 can perform five simultaneous instructions per clock cycle and operates at 135MHz, providing a maximum of 675 million instructions per second (MIPS). When combined with its 48-bit data path (enabling superior bass management processing) and single-cycle 76-bit (48x28) multiply-accumulate, TI says the TAS3108 offers an unparalleled amount of processing at its price point with 135 million multiple accumulates per second (135MMACS).

TI adds that the processor comes with a comprehensive set of tools that are optimised for audio processing, enabling the efficient implementation of proprietary algorithms and standard features such as equalisation, tone and volume control. The tools are composed of two essential parts, the Graphical Development Environment (GDE) and the Integrated Development Environment (IDE). The GDE is a graphical drag-and-drop environment that allows users to take pre-optimised components and drop them into place. They can then program and control each component in real-time, as well as publish their own components with proprietary algorithms. The IDE is a traditional tool consisting of an editor and simulator/debugger tools. The editor will show the customer context sensitive colouring and help guide them on what to input, enabling quicker programming and fewer errors. The simulator/debugger provides a PC-based environment, allowing customers to debug their code by testing it while watching memory and setting breakpoints.

Sky launches broadband

Sky is the latest company to launch a UK broadband service. Aimed at existing Sky subscribers, there are three different options to choose from. Customers can join either Sky Broadband, Base, Mid or Max. Sky says, with downloads speeds of up to 2Mb and 2GB monthly usage, Base suits people who use the internet mainly to surf and email. Mid costs £5 a month and offers down-load speeds of to up 8Mb and 40GB of usage.



Sky delivers a broadband broadside

The company says Mid is well suited for downloading, uploading and sending photos. The Max package costs £10 a month and has download speeds of up to 16Mb, unlimited down-loads (although this is 'subject to fair use policy') and free professional home installation. This service is suited to those frequently downloading video content or for online gaming enthusiasts.

Aggregator Television to roll out new services

TV operator Aggregator Limited is set to roll out a range of TV-over-broadband (TVoBB) services to the PC, which will target specific, underserved audiences in Autumn 2006. Aggregator will also deploy an extended service planned for launch in early 2007, when it will integrate its programming with Freeview, the UK's fastest growing TV platform, and make its services available on TV.

The company says its TVoBB services will create a new UK pay-TV platform, serving multiple devices including PCs and hybrid set-top-boxes. Aggregator's on-demand broadband services allow the delivery of niche content to ethnic and special interest communities that are currently underserved by the television market and are willing to pay for specialist TV services.

Aggregator's co-founder and director of programming, Chris Griffin, said: "In a rapidly changing media world, Aggregator has designed a smart TV-over-broadband platform that drives new routes to the consumer and opens up new revenue streams for content owners."


Chris Griffin, of Aggregator Television believes in TVoBB

Armour adds to its training arsenal

Armour Home Electronics has ramped-up its investment in training

Armour Home Electronics (AHE), distributor and product specialist within the custom installation sector, is making a major investment in its training programmes.

The Armour Academy, already established as one of the industry's premier training centres, is to move to a new training suite within Armour's facility at Bishop's Stortford. Armour will then open a second training academy in Manchester late in 2007. The size and facilities available at Manchester will mirror those in the south.

Construction starts on the new Bishop's Stortford centre early in September and it is expected to be fully operational by late October 2006.

Paul Hilditch, AHE's training manager said: "The whole training team is delighted with this news. The new dedicated facility will have an area of 80m/sq, some 60 percent larger at present. It is also incredibly flexible. This is because today's training environment requires us to deliver a wide spectrum of training modules, ranging from fairly straightforward lectures to specialised 'hands-on' workshops, where up to 30 attendees will sit at fully networked individual workstations."

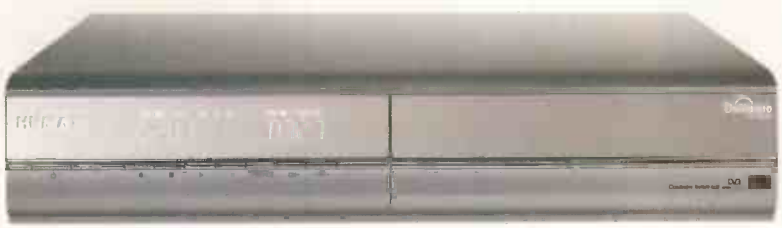
Hilditch continued: "Frankly, we just can't wait to get in and get started. It's going to raise our game to another level. We intend to increase the number of courses available by 50% and early booking indications point to an increase in attendees of 25%."

Humax is top of the box

Set-top-box and PVR manufacturer, Humax, says the latest GfK figures reveal that it has hit the top spot in terms of UK Personal Video Recorder (PVR) sales. GfK has not released details, but volume numbers for January to May 2006, show Humax has risen to the number one position, largely driven through the success of its PVR-9200T which launched in the UK in October 2005. The PVR-9200T boasts two digital tuners, a 160GB hard disk drive that can store up to 100 hours of programming and also includes live pause and instant rewind features.

Graham North, UK commercial director, Humax, said: "Humax entered the UK PVR market less than three years ago and achieving the leadership position in such a short time underlines our expertise in providing world class digital TV products.

"The PVR-9200T offers simple, effective recording and a wealth of features that puts viewers firmly in control of what they watch and when."



Humax is number one in PVRs

Microsoft takes on the iPod

Zune, Microsoft's answer to the iPod will have a hard drive, a dedicated download environment and be Wi-Fi enabled says the software giant.

Details are sketchy at this point, but the company says users will be able to buy tracks that are downloaded direct to the device when the first models become available, possibly in late 2006.

Zune is the umbrella term coined to cover the hardware, the software on the player and the download service it will be tied into. Music tracks, movies and other content will be available via this service, although at launch music files will be the only ones available.

The same team behind Xbox is developing Zune

Different copy protection systems will it make it extremely unlikely that music can be moved seamlessly from iTunes - used predominately by iPod owners - to Zune or the other way around.

Freescale launches magnetic micro chip

Flash memory chips at the heart of Mp3 players have a new rival in Mram

U.S maker Freescale has launched a new chip called Magnetoresistive Random Access Memory (Mram) which relies on a magnetic charge rather than an electrical one to maintain data.

The benefit of Mram is that it can retain information after power has been switched off or lost.

A number of companies (IBM, Infineon, Renesas, Toshiba and NEC) have been pursuing this type of technology for several years, but Freescale is the first to make it to a commercial level of production.

Mram will face stiff competition from the already established flash memory chips which form the heart of many of today's portable consumer devices and can offer sizes of up to 1GB; the new Freescale chip is just 512Kb.

However, the developers say that Mram has faster read and write speeds than flash memory and a lower power-used to information-input ratio.

One suggested function for Mram is as storage for operating systems in products like PCs allowing faster start up times.

Freescale has been working on the technology for approximately a decade and Saied Tehrani, who runs the Austin-based company's Mram programme, said the company already had customers for the chip but would not reveal any details.

Philips looses out in patent dispute

Philips has suffered a set back in an attempt to amend a patent for the company's television menu technology. The company wanted to change its existing patent, but the alterations were ruled to be too wide ranging.

The case began when Pace Micro and Philips could not agree a deal over the use of the Philips menu system which allows viewers to see thumbnails of available channels and then make a selection.

"We found an invention of an earlier date," said Richard Clack, legal counsel for Pace Micro. "It was not our patent, but we thought it showed that Philips' was not novel."

Philips proposed amendments to its patent, but Pace Micro objected to those and the case ended up being referred to the Patent Office. Hearing officer R C Kennell of the Patent Office, said: "Pace have argued that, because the wording of the proposed claim is broader than that of the description, it should not be allowed in a post-grant amendment. The patentees reject this argument as unsustainable."

Mr Clack said: "The Patent Office effectively said that the amendments would introduce added matter not contained in the original patent, and that is not allowed. This is a good result for us."

Philips is permitted to suggest alternative amendments which are not as wide ranging.

Philips is in dispute over its TV menu system

Crooks target Sky customers

According to reports credit card fraudsters are targeting Sky TV subscribers.

The scam first blanket targets phone numbers sending a recorded message asking if the house holder is a Sky customer. Those who answer in the positive are then called by one of the fraudsters posing as a Sky employee. The caller then claims the customer's Sky subscription is unpaid and warns that their subscription will be suspended unless they make a credit card payment.

The crooks then use the credit card's details to carry out illegal transactions.

According to technology website *The Register*, the scam came to light when the gang targeted Andrew Goodwill, who just happens to be managing director of online fraud prevention firm Early Warning. Goodwill then informed Sky of the problem.

Crooks have tried to target Sky subscribers

Toshiba begins microSD mass production

The Japanese business daily *Nihon Keizai* has reported that Toshiba will begin mass-production of its microSD memory cards this September. The cards are the smallest yet and the reported aim of the company is to take significant market share amid what is now seen as strong demand for smaller cards.

Nihon Keizai said Toshiba plans to manufacturer around 3-4 million MicroSD cards a month. The cards measure just 15x11x1mm, roughly a quarter the size of the miniSD cards most commonly found in applications like mobile phones. Confirmed sizes will be 256MB, 512MB and 1GB capacities. The 1GB version is expected to sell at around 10,000 yen (£46) and *Nihon Keizai* reported that Toshiba plans to introduce a 2GB microSD, which would be capable of storing around 500 Mp3 tracks.

The Japanese paper said Toshiba has been producing microSD cards since last Autumn, but like other SD card manufacturers such as Matsushita Electric Industrial, it had not began mass output because of a lack of products compatible with the new cards and high production costs.

September should also see the introduction of Toshiba's SDHC memory card which the company says brings SD cards to new levels of performance. SDHC meets the new SD memory card Ver2.00 for cards with a capacity of over 2GB. It also complies with Class 4 of SD Speed Class, a newly defined standard for data processing speed. SDHC cards are designed for high capacity applications such as digital video and continuous shooting mode for high-end digital still cameras.

Toshiba's new family of microSD cards

Slim Devices target's audiophiles

U.S Firm Slim Devices has introduced the Transporter, a Wi-Fi enabled personal music player aimed at those who prefer to store music in Flac or Wav as apposed to Mp3.

Digital music files stored on a computer can be streamed over a Wi-Fi network to Transporter which plugs into an amplifier and speakers.

The manufacturer says the strength of the Transporter lies in its digital to analogue converter (DAC) chip which converts digital information into the analogue sound that emerges from an amplifier and speakers.

Patrick Cosson of Slim Devices said Transporter was using a "miracle DAC" of a quality better than that used even in expensive CD players, resulting in better audio performance.

Cosson said: "We want people to take advantage of good file formats. Flac and Wav are the favoured formats of many digital audiophiles because they retain all the information on a CD when converted or transferred into digital or non-physical form."

World first from BenQ

BenQ has launched what it says is the world's first LCD wide-screen computer monitor with an HDMI port. The 24" FP241W will come in two versions, both of which will support the full 1080p HD resolution.

The company says the step-up version also features Black Frame Insertion technology (BFI) for a 'CRT like' quality of picture. BFI builds on Advanced Motion Accelerator (AMA) technology (also included in the screen) and uses spatial-temporal integration to effectively reduce the ghosting effect caused by the slow pursuit and low pass effect of the human eye.

BenQ says with 1920x1200 (WUXGA) resolution, the FP241W can display more content while maintaining crisp details and legible text, while its wide-screen format ensures no image distortion or cropping.

Additionally, the FP241W can also display two complete A4-size windows side-by-side making it easier to view two applications at the same time.

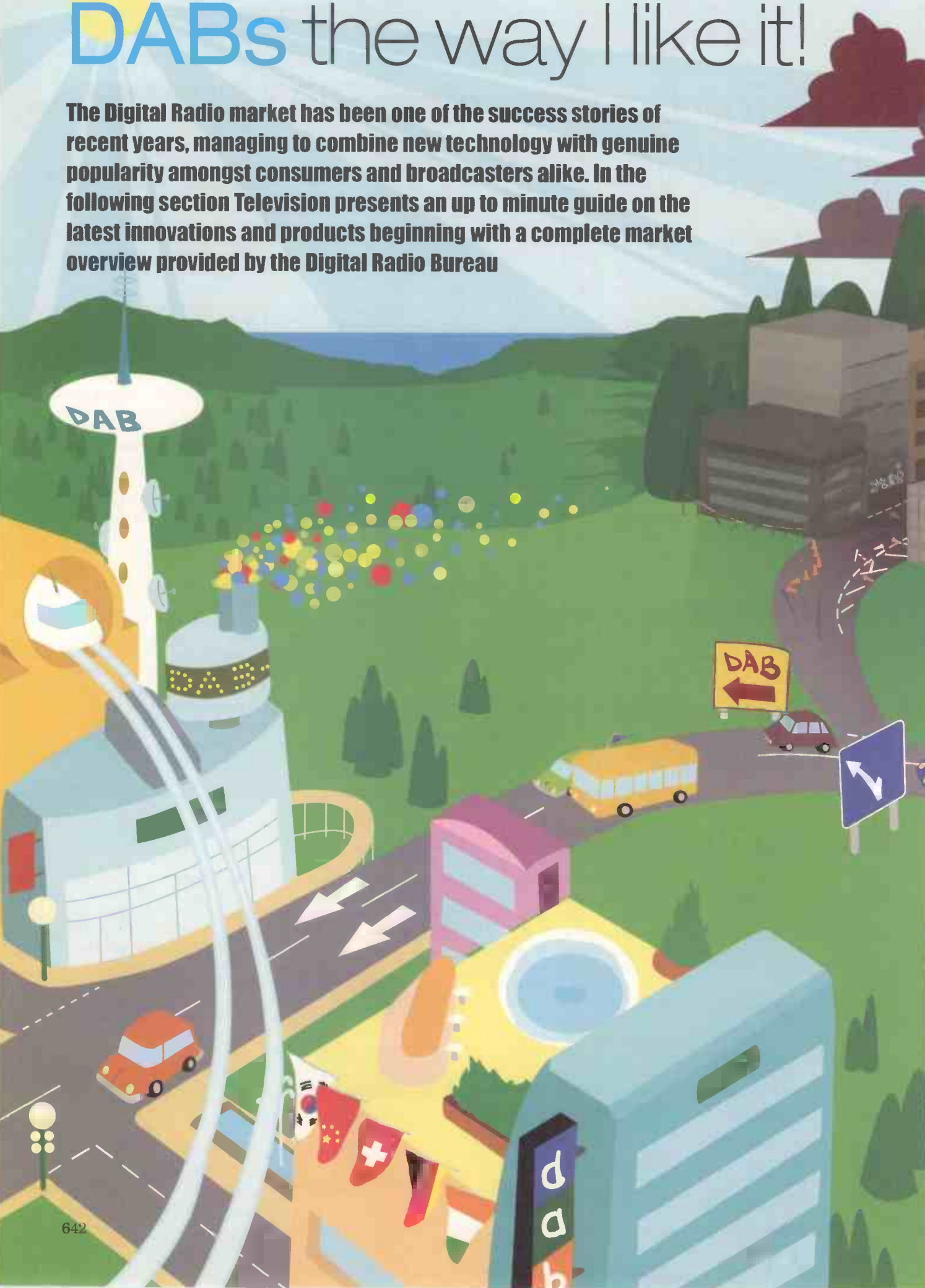
With the picture-in-picture feature users can also view video from two sources at once and the FP241W also has an adjustable screen so users can find the orientation that suits them for different applications.

The FP241W operates in 24-bit colour with a reported contrast ratio of 800.1

The FP241 is world's first HDMI enabled computer monitor

DABs the way I like it!

The Digital Radio market has been one of the success stories of recent years, managing to combine new technology with genuine popularity amongst consumers and broadcasters alike. In the following section Television presents an up to minute guide on the latest innovations and products beginning with a complete market overview provided by the Digital Radio Bureau



In April, 2006, DAB digital radio set sales in the UK topped 3.1 million cumulative units. It took five years to reach the first million sales, nine months to reach the second million and just five months to reach the third million. Clearly, DAB digital radio sales are going from strength to strength. Annual volume for DAB grew from 1.025 million year end April 05 to 1.54 million year end April 06.

This represents a 50% increase year-on-year. During the same period, analogue volume sales were down 6%. Annual value for DAB grew from £103 million year end April 05, to £146 million end April 06, up 42% year-on-year. The value of the analogue audio market fell 18% in the year ending April 06. DAB digital radio products command a 14% share of the total audio market in the UK.

DAB products account for 20% of the value of all radio sales in the UK. Nearly 14% of the UK adult population has a DAB digital radio at home and 23% of owners have more than one. Digital listening is beginning to eat into analogue's stronghold as over 16% of all radio listening is now done via a digital platform. DAB is the leading digital radio platform with more listening than the Internet and TV listening combined (Rajar Q1, 06). (see figure 1).

The DRDB's forecast for this year shows DAB digital radio continuing to increase its market share over analogue. Annual volume sales for 2006 are forecast at two million, while the market value is forecast at £169 million. This report analyses the UK audio market, breaking it down by form factor and comparing DAB and analogue sales. It looks at the DAB consumer and examines the reasons for buying DAB over analogue. (see figure 2).

The DAB market in detail

The total annual radio market in the UK is 11.6 million units worth an annual £742million (y/e April 06). The following pages compare DAB and analogue sales by segment, by value and by volume.

Portable/Kitchen radios

The portable kitchen radio market represents 16% of the overall market (all radios) by volume and 11% by value. The portable kitchen radio market in the UK was the first to take off for DAB digital radio with the introduction of affordable, battery operated devices. Today there are over 90 different portable kitchen DAB radios on the market, with prices starting at under £40. They come from all the leading brand names, as well as from some new, innovative manufacturers.

In the year ending April 2006, 814,000 DAB portable kitchen radios were sold and in January 2006, the DAB portable kitchen market eclipsed the analogue market for the first time by volume with 54% of the market. In the year ending April 2006, the portable kitchen radio market by value was £64 million compared to analogue sales in the same period worth just £17 million. In January 2006, the DAB portable kitchen market represented 80% of the entire sector by value. (see figure 3).

By volume, year-on-year to January 2006, the DAB portable kitchen market grew by 38%, while the analogue market fell by 23%. The DRDB says a DAB portable kitchen radio delivers more than three times the value of a similar analogue product.

The average price of a DAB portable kitchen device is £77 versus analogue at £18 – that's a premium of 328% for DAB. Prices of DAB portable kitchen radios vary from around £40 up to £200. They can be basic mono, mains operated DAB only products, or can include FM, stereo, battery (sometimes with charge packs), pause, rewind, record and other functions. They can be retro or fashion chic. The portable kitchen DAB radio has been the mainstay of sales and its popularity is set to continue.

Volume of the DAB portable kitchen market is forecast to reach more than one million

Figure 1

DAB digital radio cumulative sales

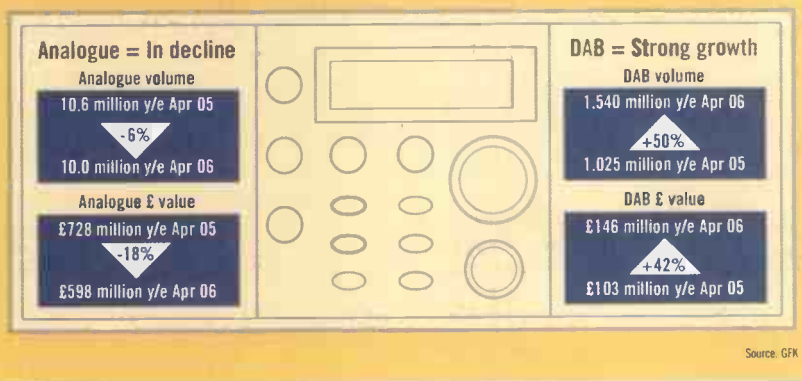
OVER 3.1 MILLION SOLD

1.54 million sold in the last year (y/e Apr 06)

Source: GFK - approx 88% coverage of the DAB market

Figure 2

Analogue In Decline - DAB Strong Growth



Source: GFK

products annually by 2007 but value of the DAB portable kitchen market is forecast to remain steady at between £65 million and £70 million annually, as prices fall. (see figure 4).

Clock radios

The clock radio market represents 13% of the overall market (all radios) by volume and4% by value at £31 million.

The first DAB clock radios did not appear on the market in the UK until October 2003, more than a year after the first portable kitchen DAB radio appeared. Today there are 23 different DAB clock radios on the market, with prices starting at under £40.

Figure 3

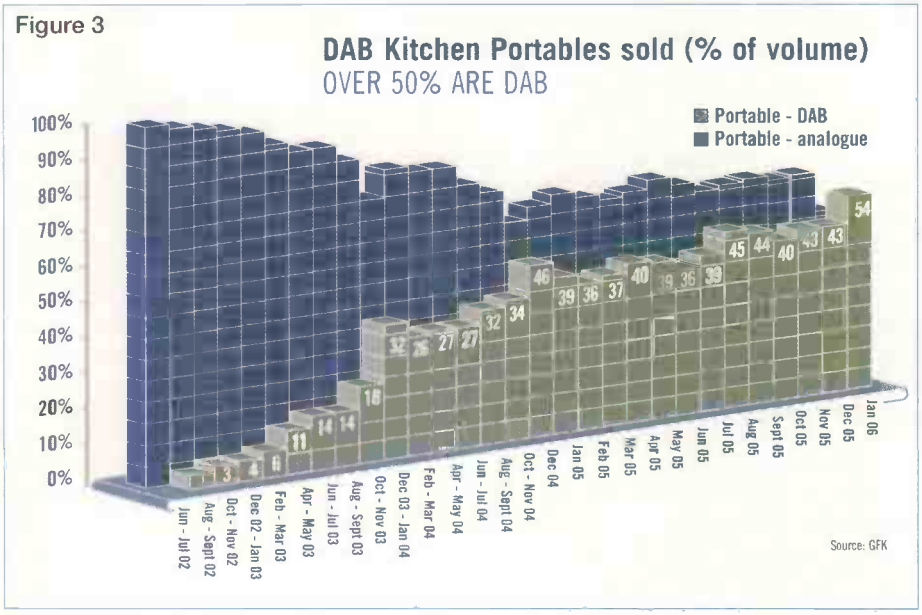
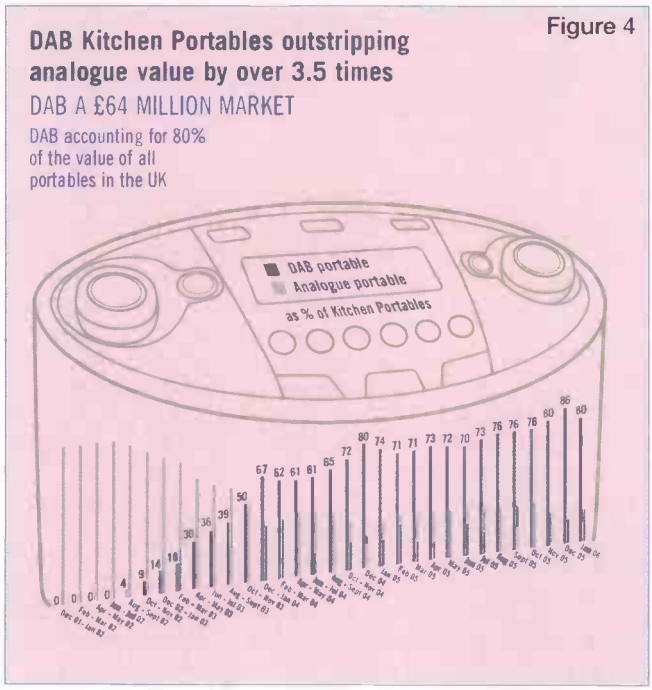


Figure 4



In the year ending April 2006, 103,000 DAB clock radios were sold.

In April 2006, DAB clock radios represented 8% of the overall clock radio market, up from 3% in April 2005. The indication is that clock radio is a sector loaded with opportunity for manufacturers and retailers.

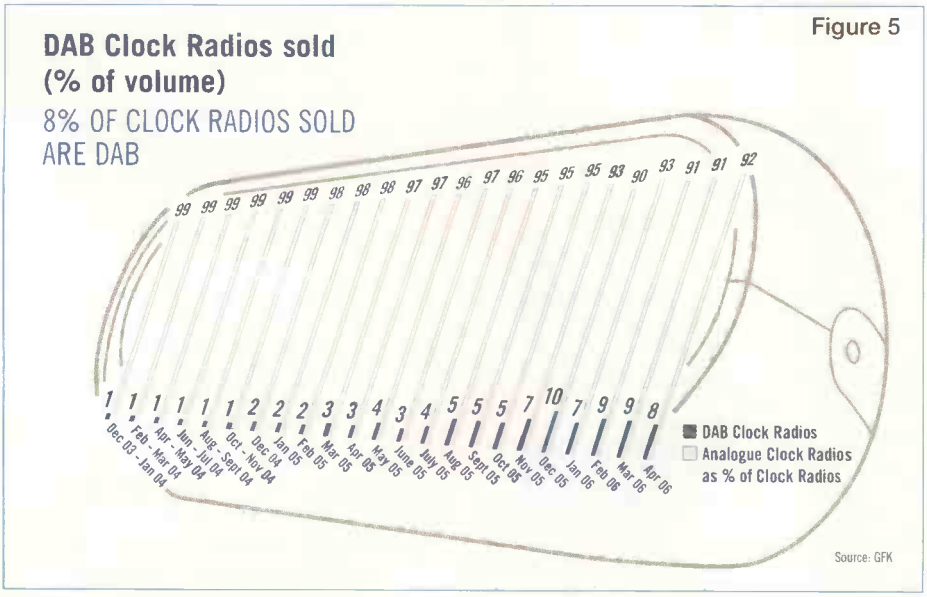
In terms of value, the DAB clock radio market was worth £8 million in the year ending April 2006.

In the same period, the analogue clock radio market was worth £23 million. In April 2006, the DAB clock radio market represented 32% of the entire sector by value, up from 12% in April 2005.

By volume, year-on-year to April 2006, the DAB clock radio market grew by a massive 214%, making it the fastest growing sector within DAB. During the same period, the analogue clock radio market fell by 4%. (see figure 5).

A DAB clock radio delivers more than five times the value of a similar analogue product. The average price of a DAB clock radio is £74 versus analogue at £14 – that's a premium of 429% for DAB. Volume of the DAB clock market is forecast to grow from less than 100,000 in 2005 to more than 800,000 products annually by 2009. Value of the DAB clock market is forecast to grow from £6.3 million in 2005 to around £36 million in 2009.

Figure 5



Audio Systems

The audio system market represents 22% of the overall market (all radios) by volume and 43% by value at £314 million.

The first audio systems with DAB came to market even more recently than either clock or portable kitchen devices. It was February 2004 before the first such product appeared in UK stores.

Today there are 41 different DAB audio systems available in the market, making it the

second most prolific sector overall. Prices start at under £50.

In the year ending April 2006, 333,000 DAB audio systems were sold.

In April 2006, DAB represented 16% of the overall audio systems market, up from 8% in April 2005. The DAB audio systems market was worth £50 million in the year ending April 2006.

In the same period, the analogue audio systems market was worth £264 million. In April 2006, the DAB audio systems market represented 19% of the entire sector by value, up from 10% in April 2005. By volume, year-on-year to April 2006, the DAB audio systems market grew by 70%, making it the second fastest growing sector in the market. During the same period, the analogue audio systems market fell by 22%. The average price of a DAB audio system is £163 versus analogue at £133 – that's a premium of 23% for DAB.The audio systems market is the largest segment of the overall radio market in the UK, representing 22% of all radio sales. Clearly there is great potential for DAB in this sector and some manufacturers have already indicated they will de-range analogue-only products from their lines. Volume of the DAB audio systems market is forecast to grow from 293,000 in 2005 to nearly 1.5 million products annually by 2009. Value of the DAB audio system market is forecast to grow from £42 million in 2005 to more than £160 million in 2009.(see figure 7).

Figure 6

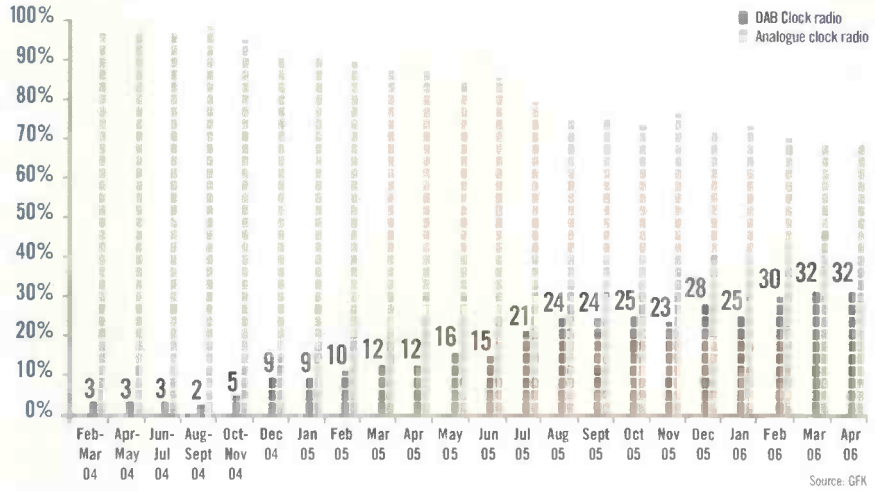
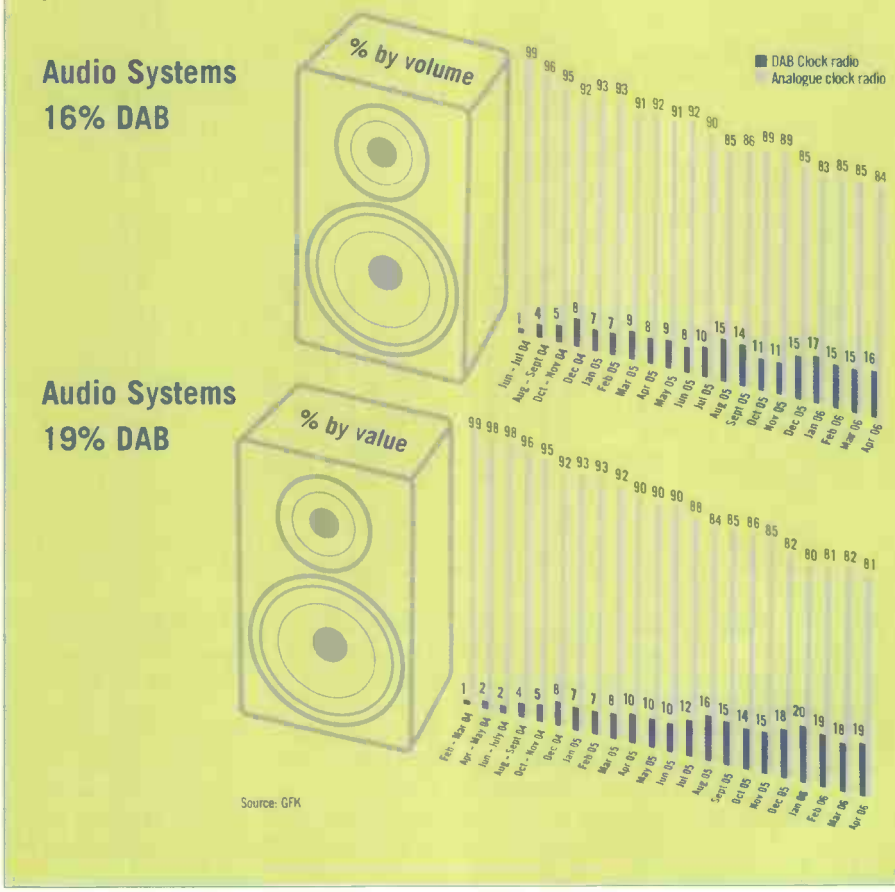


Figure 7



Handheld/Personal

The handheld/personal radio market represents 5% of the overall market (all radios) by volume and 2% by value at £14 million. Personal radios with MP3 playback are a separate category making up a further 8% of the overall market (£63 million value).

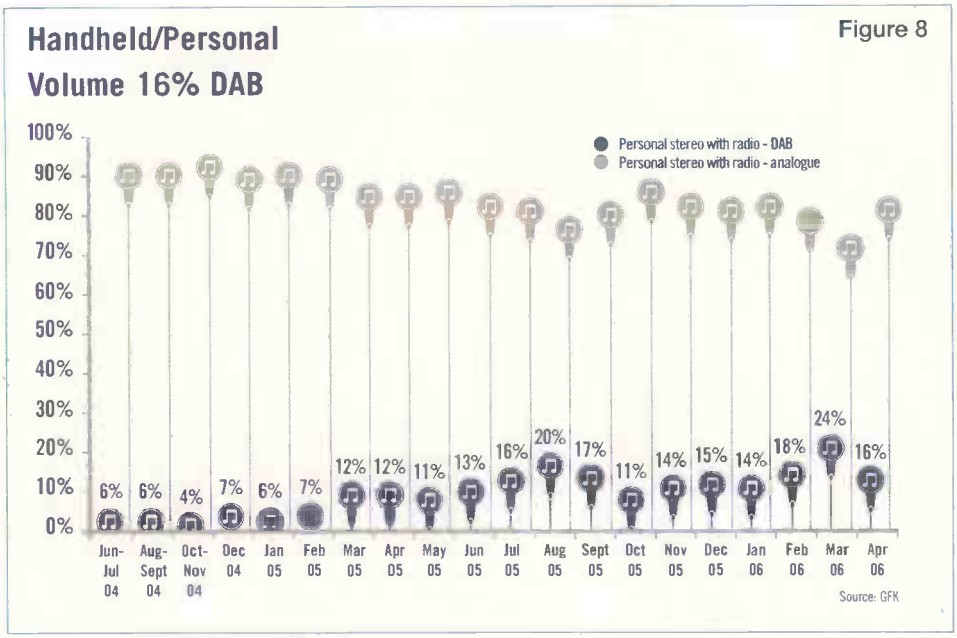
There are 25 personal DAB digital radio models in the market. Of these, only seven are also MP3 players. Because they have only been available since late 2005, the data on personal DAB radios with MP3 is limited, and there is no year-on-year comparison.

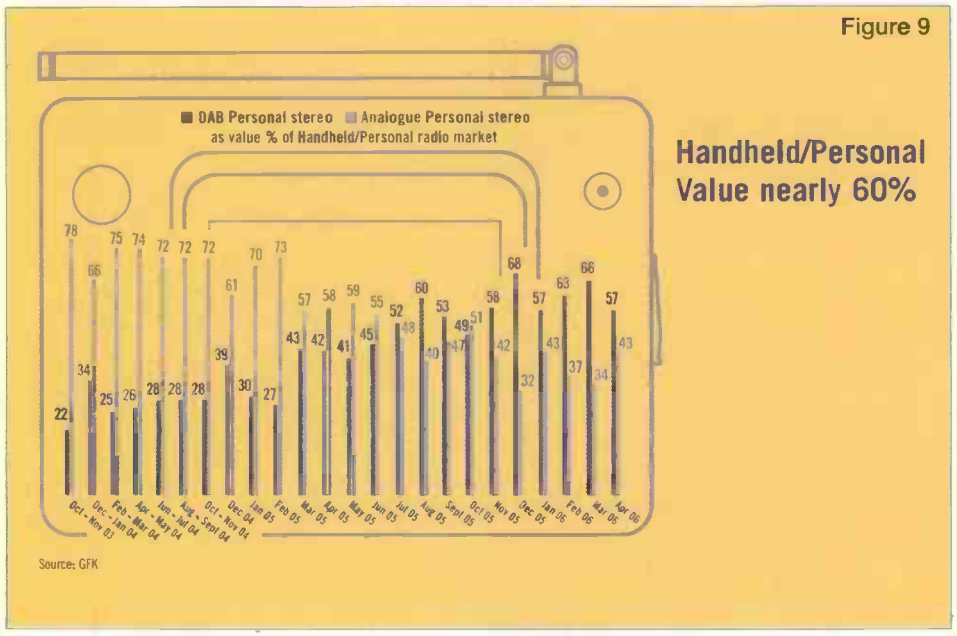
Personal DAB digital radios start at under £60, those with MP3 are available from £150.

DAB With MP3

DAB With MP3 represented four thousand sales in the year ending April 06 with the value of the market coming in at £712,000 and it is expected to see huge growth in the coming year.

In the year ending April 2006, 89,000 DAB hand held personal radios were sold. In September 2005, leading UK retailer Currys reported sales of DAB digital radios rose 70% in the 24 hours leading up to the start of the last test cricket match between England and Australia.





The personal DAB radio market was worth £8 million in the year ending April 2006.(see figure 8).

In the same period, the analogue personal radio market was worth £6 million. In April 2006, the DAB personal radio market represented 57% of the total sector by value, up from 42% in April 2005. By volume, year-on-year to April 2006, the DAB personal radio market grew by 13%. During the same period, the analogue personal radio market fell by 21%. A DAB personal radio delivers seven times the value of a similar analogue product. The average price of a DAB personal radio is £83 versus analogue at £12 – a massive premium of 592% for DAB. The DAB personal radio category is expected to grow significantly over the coming years, with particular increases in models with MP3 compatibility. Only 0.01% of MP3 players sold come with DAB. These are worth just 0.3% of the MP3 market. Volume of the personal DAB/combined MP3 player market is forecast to grow from 2,000 in 2005 to nearly 500,000 annually by 2009. Value of the personal DAB/combined MP3 player market is forecast to grow from £300,000 in 2005 to around £55 million in 2009. There is also potential for DAB digital radio to appear in MP3 accessories, such as docking stations. (see figure 9).

Radio CD/Cassette

Boombox versus MP3 Docking Stations

A "boombox" is a portable radio with CD and/or cassette recorder. It represents 20% of the overall market (all radios) by volume and £62 million by value.

The DAB boombox category is one with potential for growth. Boombox is the second largest sector in the overall radio market, with more than two million units sold a year. Yet there are only 14 DAB boomboxes on the market. They start at £50. Even though there are so few products available with DAB in this category, in the year ending April 2006, 107,000 products were sold at a value of £7 million. That equates to 11% of the value of the overall boombox market.

However, overall, the boombox market has slowed drastically in the past few years and MP3 docking stations are starting to steal its share leading to a potential new market combining MP3 and DAB in a speaker driver product.

The average price of an analogue boombox is just £25, but consumers appear prepared to pay considerably more for a docking station on which they can play their MP3 files.

The average price of an MP3 docking station is £60. Adding a DAB module to a docking station adds to the unit's functionality and brings another dimension to the listener's entertainment. Six point eight million MP3 players worth £551 million sold in the year ending March 06. One and a half million DAB radios worth £145 million sold in the year ending March 06. Five hundred and fifty eight thousand MP3 docking stations worth £35 million sold in the year ending March 06. (see figure 10).

Set Forecast

The updated version of the DRDB's forecast (to be published in September) shows DAB digital radio continuing to increase its market share over analogue. Annual volume sales for 2006 are forecast at two million, with portables and audio systems leading the way.

Over the next few years, these two sectors will

continue to dominate, but clock radios, and especially personals with MP3 included will grow significantly.

Inevitably, as DAB digital radio becomes more mass market, prices will drop. Yet DAB will continue to outpace analogue in terms of value for many years to come. In 2006, the market value is forecast at £200 million, with portables and audio systems to the fore. However, over time, the value of the portable market will decrease while the audio systems market – forecast to be worth around £62 million in 2006 - will more than double by 2009. Similar growth is forecast for clock radios, which could triple in value over the next three or four years. Triple growth is also forecast for personals and personals with MP3.

With over three million DAB digital radio sets already sold in the UK and 40% of homes predicted to own one by 2009, the radio industry has entered a period of revolutionary change.

This report was compiled by the Digital Radio Bureau www.drdb.org, Tel: +44 (0) 20 7306 2630

More analysis from the DRDB next month

Figure 10

MP3 Docking station sales in the last year

6.8 MILLION MP3 PLAYERS SOLD IN THE LAST YEAR

YEAR ENDING MAR 06	MP3 DOCKING STATION PRODUCTS	DAB RADIOS	MP3 PLAYERS
VOLUME:	588K	1.5 MILLION	6.8 MILLION
VALUE £:	35 MILLION	145 MILLION	551 MILLION
AV PRICE £:	60	95	81

Source: GFK

RadioScape believes its new innovations will enable digital radio manufacturers to cut costs with simpler IC solutions

Digital Radio

RadioScape, one of the leading companies driving the technology behind digital radio and mobile communications, outlines its successes and plans for the future

RadioScape laid out its some of its future plans at the recent Broadcast Asia show 2006. Dr Les Sabel, RadioScape's VP of technology, presented a paper on the company's 'flexible platform for multi-standard multimedia solutions in the mobile world'.

Mr Sabel said: "RadioScape was a key technology provider for Mobile TV trials that are taking place around the world.

"RadioScape is unique in that it is the only company that provides both broadcast and receiver technologies giving integrated, end-to-end solutions that ensure robustness and reliability. The secret to the company's success in being able to provide flexible solutions, which can be easily adapted to incorporate a variety of standards in the rapidly evolving world of Mobile TV, is that it uses software to define the functionality, i.e. Software Defined Digital Radio. Underpinning this is a framework called RadiOS that enables modular software functionality to be loaded only when needed, hence allowing a wide variety of applications to be incorporated into high-end, feature-rich products."

The paper covered the rapidly evolving Mobile TV environment with numerous closely related but different standards, and the relative merits of ASIC versus a software-defined solution based on RadiOS in addressing this market.

To underline its place in this market RadioScape point out that it has provided the broadcast system technology for the following trials:

- The DAB-IP trials in the UK in 2005-2006
- The current joint mobile TV trial by RTÉ and RadioScape in Dublin
- The Centre of Excellence for Digital Broadcasting (CoEfDB) trial in the Netherlands
- The DMB/DAB-IP Mobile TV trial in the UK that was announced on the 5th of June 2006
- Trials in China with over nine installations in operation, some of which are now broadcasting commercially.

RadioScape is also keen to point to its success in the recent TechCon Product of the year at the TechCon 2006 conference (organised by the Radio Academy at Cambridge in the UK) for its RS500 digital radio module. The module combines the ability to receive six frequency bands and four radio standards, enabling truly multi-standard digital radios to be created at consumer prices.

The company believes multi-standard radios based on the RS500 will open huge new markets for broadcasters and provide listeners with a wealth of new stations to choose from (all with digital clarity) and keep the various technologies transparent to the user who simply selects the station required from an on-screen list.

RadioScape's says its pioneering software defined digital radio concept enables the company to create this innovative module, which uses a standard hardware platform running software to provide the functionality thereby keeping costs down. It simply uploads the appropriate software to handle DAB (Digital Audio Broadcasting), DRM (Digital

Radio Mondiale), FM or AM and automatically configures the RF front end and baseband as required via software.

The RS500 module is already in production and consumer radios based on it will be available soon. A production model was shown at TechCon so that attendees could see the features and listen to the quality of the reception across all the radio technologies.

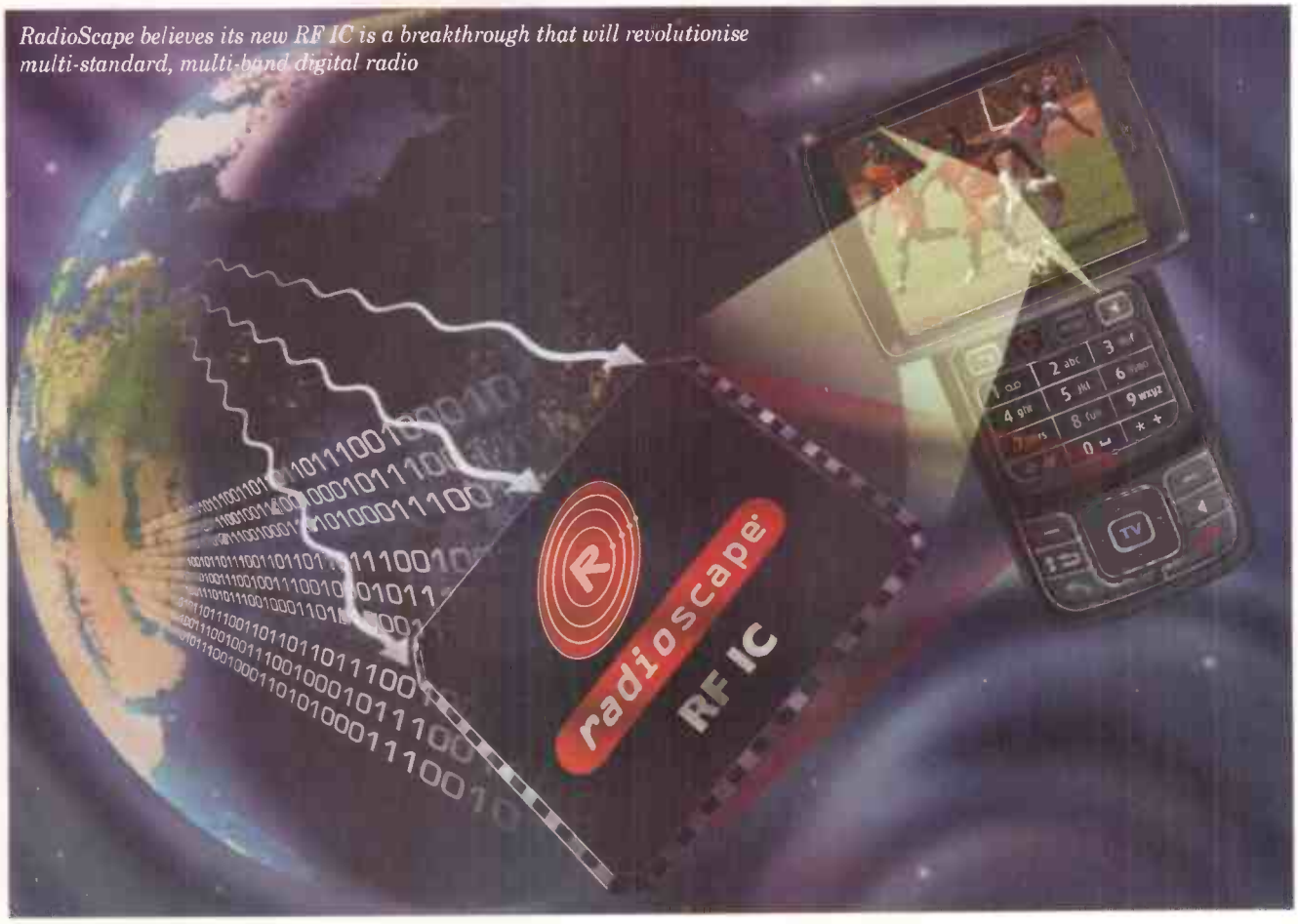
RadioScape has also, through its knowledge in the RF and software sectors, been able to create the first, software-controlled, single chip RF front end that can handle six frequency bands – Band III and L-Band for Digital Audio Broadcasting (DAB), medium wave, long wave and short wave for AM and Digital Radio Mondiale (DRM), and Band II for FM. The RF chip combines with a standard DSP chip that runs RadioScape's baseband digital radio software and also controls the RF IC to form a two chip solution, which dramatically reduces the power consumption and size of modules compared with current generation solutions.

"This new RF IC is a breakthrough technology for RadioScape that will revolutionise multi-standard, multi-band digital radio," said John Hall, RadioScape's CEO. "There is nothing like it in the market and is the result of a major initiative that we started over two years ago to create a technology platform for our next generation consumer radios. The objective was to create a highly flexible RF device that would complement our software-defined radio approach, timed to coincide with the emerging DRM market, and we have done that.

"Until now, the only way to create a comparable multi-band digital radio was to create independent RF front ends for each of the different frequency bands – each consuming power and adding to the bulk of the product. Our unique partitioning of the radio system allows us maximum re-use of the digital components by loading only the appropriate baseband stack into the DSP as and when required." explained Dave Hawkins, VP of Business Development at RadioScape: "We have used the same approach in our RF IC, which re-uses internal functionality to best suit the frequency band and standard required at the time. Dynamic configuration of the RF path on the RF IC is controlled by the DSP using software algorithms to ensure the optimisation of both performance and power consumption. The result is a multi-frequency RF device that requires less than half the power used by the equivalent circuits in our current generation of multi-standard modules."

Available only in a RadioScape module offering, the RF IC will be used to create a new range of modules, including a version of its own RS500, that maintain the size and pin configurations of existing modules to enable manufacturers to quickly take advantage of this latest RadioScape innovation and benefit from the lower power consumption that it offers.

The company underlines that this is the first time that a single, front end RF chip has been implemented to handle these six, very different, frequency bands. While this chip uses both zero-IF and super-heterodyne methods to achieve the stringent requirements of the variety of standards and frequencies, RadioScape's pioneering software-controlled approach enables a significant part of the implementation to use common circuitry. A major benefit of this challenging approach is the dramatic reduction of the external component count by over 150 items relative to equivalent designs which implement these standards. The high level of integration of the chip enables the board real estate for the front end RF to be reduced from 30 sq cms (covering both sides of the board) to only 9 sq cms on a single-sided board design for all standards and even smaller if a subset of standards and frequency bands is required.



RadioScape believes its new RF IC is a breakthrough that will revolutionise multi-standard, multi-band digital radio

BT welcomes new DAB standard

BT has welcomed the approval of a revised DAB (Digital Audio Broadcasting) standard which now allows mobile TV and virtually any other content to be broadcast reliably using internet based technologies. The revised standard will underpin the BT Movio service – the first wholesale broadcast mobile entertainment service to launch in the UK this summer.

As part of the revised EN 300 401 specification, The European Telecommunications Standards Institute (ETSI) has included a capability which, using IP to run on a DAB network, allows audio, video and other data to be broadcast efficiently and reliably.

BT says with the continuing debate around standards for broadcasting TV and radio to mobile phones, the approval of this technology as part of the DAB ETSI standard reinforces its view that the eventual winner in this technology race will not be a single standard or technology, but a combination of: 3G, WLAN, DAB, DVB-H and other technologies using the unifying quality of IP to deliver mobile TV and radio to consumers.

Emma Lloyd, managing director of BT Movio, said: "The approval of this latest enhancement to the DAB standard supports what we've been saying for some time.

"We will see multiple standards for mobile TV and radio appearing in different markets across the globe. Those adopting a multi-standard approach will therefore emerge as the winners in this potentially lucrative market.

"Consumers want simple access to high quality TV and radio wherever they are. By using a platform based on IP, we can join different technologies and standards together to give the consumer a seamless experience to enjoy their favourite TV and radio programmes on their mobile phone."

The BT Movio service will launch commercially in the UK this summer. BT Movio has chosen to launch the service via a DAB-IP based platform for three key reasons:

Firstly, DAB provides the only national broadcast capacity available in the UK today and for the next couple of years. Should DVB-H or other IP capable broadcast standards become available in the future, BT Movio could potentially integrate these seamlessly, to provide consumers with further choice of TV and radio channels.

By using the DAB network, BT Movio can also offer access to all of the UK's DAB digital radio stations, in addition to mobile TV. One of the key findings from the recent BT Movio pilot was that while mobile TV was extremely popular, consumers found the digital radio aspect of the service equally attractive.

Finally, DAB-IP is currently the only available platform which is efficient enough to use the existing digital radio capacity in the UK to deliver several TV channels and a seven day programme guide.

John Hall, CEO of RadioScape said: "We are a leading provider of DAB-IP for trials around the world and have been working closely with BT Movio on the implementation of the DAB-IP platform here in the UK. We are delighted that the technology has now been standardised by ETSI and believe that this will give greater impetus to the adoption of the multi-bearer/IP strategy in other markets.

"We are uniquely positioned to support these multi-standard requirements as our software defined solutions are specifically designed to handle whatever standard or feature is required at the time."

BT plans to supply mobile TV via a new BAB standard

DAB product round-up

More and more companies are jumping on the DAB band wagon, with very different takes on the Digital Radio proposition

The Eton Sound is dubbed the 'Mini Cooper' of radio

Marantz says that, while DAB might be the future of radio broadcasting, with its effortless access to more than 300 crystal clear new stations nationwide, there are still many excellent broadcasts on FM and AM bands. To access the best of both these worlds, Marantz has introduced its new remote-controlled ST7001 DAB/FM/AM tuner.

The company says, the beautifully built and finished, £300 ST7001 is the perfect combination of digital and analogue. In one elegantly designed package it leaves no station untuned. As with all DAB models the dual band ST7001 is incredibly easy to use, embracing ergonomic controls such as a neat jog dial control, allied to an easy-to-read display, which shows station, artist and track names as well as additional information such as lyrics.

Marantz argues that the set-up also delivers exceptional performance with higher quality analogue broadcasts. The FM tuning section is especially good at extracting the best quality signal, even under difficult reception conditions. A careful balance of sensitivity, selectivity, capture ratio and dynamic range assures the best possible audio quality across every station. And thanks to 200 presets users never need to search for a station again.

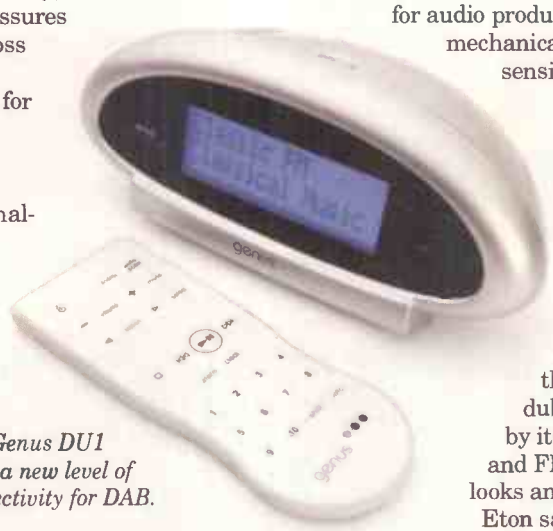
At the heart of the design is the very latest, highly integrated DAB solution that ensures excellent signal-to-noise ratios. Complementing this is a high-performance 24-bit/192kHz multi-bit, sigma-delta digital-to-analogue converter from respected manufacturer Analog Devices.

Moreover, Marantz engineers have paid the same attention and used the same high-quality, proven circuit architecture as found in the company's compact disc players to ensure the very best sound quality. This embraces signal paths that are very short for a minimum of degradation and mirror imaged. Such topology, with symmetrical right and left channel layout, provides incredibly precise stereo imaging.

The analogue symmetrical circuitry and the power supply circuit are equipped with specially selected and even customized components to enhance the sound quality.

The model embraces Marantz's new specially designed low resonance, acoustically damped all-metal chassis. Taking in a thick anodised aluminium front panel and large shock-absorbing feet, the elegant and stylish casing – available in black or silver – offers the perfect foundation for audio products, minimising any sound-degrading mechanical vibrations that can disturb the sensitive circuitry.

Completing the package is the RDI (Radio Data Interface) optical digital output. This future proofs the ST7001, allowing reception and decoding of future text, graphics and video data when connected to a suitable PC or set-top box.



The Genus DU1 adds a new level of connectivity for DAB.

Nevada

Distributed in the UK by Nevada, the Eton Sound 102 DAB/FM Radio, dubbed the 'Mini Cooper' of DAB radio by its designers, features a DAB Digital and FM clock radio as well as eye-catching looks and excellent sound.

Eton says the ultra-sensitive DAB receiver gets signals where other radios simply cannot and is easy to adjust from anywhere in the room with it's own remote control unit.

It has an auxiliary input so users can connect their MP3 player for room-filling sound. Full clock radio functions come as standard, as do five station presets. The sets are available in white, black, red, blue, green, silver and purple.

British DAB radio manufacturer, Genus, has some interesting takes on the DAB proposition including the Genus DU-1 DAB Converter. This has a stereo output that will connect into any mixing desk, amplifier or hi-fi system.

The company says that for under £50 the DU-1 means mixing desks or existing Hi-Fi system can be converted to DAB without consumers breaking the bank.

Marantz want to combine the best of AM and FM with the new Digital transmissions in the form of the ST7001

The iTech Cube from Genus automatically scans and memorises available stations for DAB selection

All it takes is a single cable and the discrete mini box connects up to any existing sound system, giving the listener crystal clear DAB radio reception and the massive selection of radio stations that go with it.

This neat box of tricks measures only 17cms wide by 7cms tall, comes with a remote control, an alarm clock and has 20 memory presets.

A more straight forward proposition is available from Genus in the shape of the VERO. Genus says the VERO 1 DAB/FM portable radio is as beautiful as it is simple to use.

A feature that the company claims is unique to DAB radios under £80, the VERO 1 includes two full range 5 Watt speakers and is simple to use offering the choice of both DAB and FM. The VERO 1 runs on mains or batteries.

When operated by batteries, electronic safeguards are engaged automatically to optimize battery life. Additional features include an alarm clock radio with snooze and week day/weekend settings, ten presets on DAB & FM for quick access to the user's favourite stations and an LCD brightness control.

Also available from Nevada is the iTech Clock/DAB/FM Cube Radio. Its makers describe it as a cute DAB/FM/Clock radio in cubic design that would be a welcome addition to any kitchen or bedroom environment.

The display clock and alarm will wake up the user to their choice of DAB/FM radio stations or it can utilise a simple buzzer.

The iTech Cube automatically scans and memorises available stations for DAB selection. The screen is big enough to display the station name and details, scrolling broadcast information about the song title and artist.

Switching between DAB and FM is easy with the clearly marked menu button and from what is shown on the high resolution display.

With a speaker at the top of the Cube and a clear backlit display screen, the menu structure makes it simple to navigate around the different features.

The FM option also has a scanning feature. The Cube offers an easy to use experience with 12 presets to store favourite stations.

The Vero I offers DAB or FM options

Pure Digital

Pure was one of the pioneers in the UK's digital radio scene providing not only products but developing the technology as well. Its latest product offerings include the Bug TOO, developed in conjunction with design guru Wayne Hemmingway.

Pure Digital's Bug TOO has a distinctive design and up to the minute features

The company insists Bug TOO has both an award-winning British engineering pedigree from the company that revolutionised DAB in the UK and a brilliant, much-talked about, design. Wayne Hemingway is the successful co-founder of Red or Dead (three time British Fashion Council "Street Style Designer of the Year" winner) and of Hemingway Design.

Says Hemingway: "The original Bug added features that totally changed the way people could listen to and interact with their radios. In the fast paced world of technology nothing stays static and I'm delighted to see the Bug continuing to evolve and get even better."

Pure Digital says the original Bug was the first DAB radio to get advanced features such as MP3 playback, record to SD card, and ReVu, which lets users pause & rewind live radio. Bug TOO takes the radio's advanced functionality to the next level adding all the latest DAB digital radio developments, including electronic programme guide (EPG) and textSCAN, which allows listeners to pause and control DAB scrolling text, giving time to note down web addresses, competition phone numbers or song titles.

EPG is now supported by major UK broadcasters including the BBC, Classic FM, Virgin, Capital Radio and many others, so the EPG functionality of the Bug and other EPG equipped radios can really come into its own. In some cases, offering close to 'Sky+' levels of content manipulation.

Bug TOO enables users to record multiple tracks or complete radio programs to an SD-card. The EPG functionality means Bug TOO can record by a single press of the 'Record' key when on the highlighted program. Users can listen to shows they've recorded later on the Bug TOO itself, transfer the recordings to a PC via USB or card reader or take their favourite shows out and about using a compatible device such as the PURE PocketDAB 2000.

New MP3 hi-fi options are also included on the Bug TOO which enable MP3 folder navigation and lets users wake-up to their favourite MP3 or recording.

Pure Digital says as well as a great digital radio Bug TOO is a versatile MP3 audio system with full support for ID3-tags, subfolders and MP3 alarms. MP3 collections can be played back from SD-card, as can DAB digital radio recordings. The Bug can connect to a PC via USB for easy transfer of music files.

Bug TOO is also billed as the perfect bedtime companion, featuring up to 20 configurable alarms that let the user wake to their favourite DAB radio station, a tone or an MP3 track or recording.

The company also points out that, thanks to PURE's USB upgradeability, existing Bug owners won't miss out. Bug owners will be able to upgrade to take advantage of EPG, textSCAN and the new MP3 features.

Pure Digital is also very proud of its record in delivering hand held DAB products. The latest in this family is the PURE PocketDAB 1500, billed as a stylish handheld portable DAB and FM digital radio.

The PocketDAB 1500 builds on PURE's successful PocketDAB 1000 radio by adding FM with RDS, textSCAN, a new colour scheme and a ChargePAK rechargeable battery pack. And at just 123g PocketDAB 1500 is Pure Digital's lightest portable to date. To ensure listeners get the very best sound out of their radio PocketDAB 1500 comes with Sennheiser MX300 in-ear headphones as standard.

Pure Digital argues the PocketDAB 1500 is the premier handheld DAB digital radio for the discerning radio listener on the move, enabling the user to enjoy DAB's improved reception, station choice and audio-stability anywhere that broadcasts are available.

The PocketDAB 1500 has modern, attractive styling, with its striking black anodised aluminium casework and attractive orange backlight display with clock and status icons. With the Lithium Polymer L37 ChargePAK PocketDAB 1500 recharges from the mains, just like a mobile phone, to provide up to 24 hours of roaming DAB playback.

The Sennheiser MX300 headphones deliver a wide 18 Hz to 20 kHz frequency response with a bass-driven design that's optimised for music.

PocketDAB 1500's portability is enhanced both by the unit's light-weight design and the absence of a cumbersome telescopic aerial – in fact the PocketDAB 1500 uses its Sennheiser headphones as an aerial for maximum usability and performance.

Colin Crawford, director of product marketing, Pure Digital, says: "With headphones from Sennheiser, one of the world's most respected headphone brands alongside new PURE innovations such as textSCAN and ChargePAK, PocketDAB 1500 takes handheld radio listening to the next level. Our engineers have pulled out all the stops on this radio, adding FM with RDS in case users want to travel outside of the DAB broadcasting countries, whilst still managing to create a product that's significantly cheaper than its predecessor."

The PD1500 pocket DAB

PocketDAB 1500 has been designed for ease of use with a central joystick for navigation and separate controls for key functions like display settings, presets and DAB/FM. Stations are simply selected by name and the PocketDAB 1500 automatically tunes in, eliminating the fine-tuning and re-tuning required by analogue portables.

PocketDAB 1500 also automatically remembers the user's ten most listened to stations in a favourites list for fast selection and has 20 presets (10 DAB and 10 FM). Stations can be ordered alphanumerically, by multiplex, by favourite and by active stations for maximum ease of use.

Also launched this summer from Pure Digital was the new range of PURE EVOKE-1 Prestige DAB digital radios.

PURE's Prestige radios have proved to be a hit with the more discerning listener and as a result the company has

The Evoke ONE delivers lots of features for under £50

added
Triband Editions–
including FM support and a range of new
wood finishes – based on its award-winning model.

The company says its Prestige Triband Editions are designed for radio listeners who appreciate the finer things in life. Hand-crafted from high-quality materials, PURE Prestige Editions are elegant and perfectly proportioned, with multiple finishes to match the finest interior décor. The EVOKE-1 Prestige Edition combines craftsmanship, design and technology to create a uniquely refined, luxurious radio with an air of exclusivity.

EVOKE-1 Prestige Triband radios receive not only DAB digital radio broadcasts, but also FM with RDS. The company says, even considered solely as a high quality FM receiver, the EVOKE-1 Prestige Triband is the ideal choice for radio lovers, beating the sound and reception of other luxury FM radios.

The EVOKE-1 Prestige Triband is available in Bird's Eye Maple, Burnt Redwood and Piano Black finishes, all in a high-gloss lacquered coat. These new finishes are created using more intensive manufacturing processes to create a radio of perfect style as well as perfect sound.

Colin Crawford, of Pure Digital, says: "The original EVOKE-1 revolutionised radio and quickly became a design classic. Now this classic DAB radio has evolved into the ultimate high-class radio, the EVOKE-1 Prestige Triband.

"PURE's Prestige Editions have been specifically designed for radio listeners who appreciate the finer things in life. With vintage looks and modern lines, our Prestige radios are set to be timeless classics that owners will enjoy for years."

EVOKE-1 Prestige Triband has easy-to-use DAB features such as station selection by name and scrolling text showing song titles, artist information, news updates and sports results. The radio features radius-edged veneered casework and a large, clear white-on-blue display.

The package is completed with a clock display, a tone/radio alarm and a kitchen timer. Its class-leading audio performance is delivered via a custom-designed speaker and active filters.

Pure Digital has not forgotten the more affordable end of the market and the Pure One is presented as an affordable DAB and FM portable radio that looks good, sounds great and is unbelievably easy to use.

Pure Digital says the ONE is the ideal radio for DAB aficionados looking for an extra radio for the house, garden or office and for newcomers to DAB too. Despite its sub-£50 price tag, Pure Digital says it delivers everything users would expect from a Pure DAB radio – station selection by name, scrolling text display, one-touch tuning, and crisp, clear, digital sound, and of course more listening choice.

The company says ONE also includes features not previously seen on a sub £50 DAB radio – FM with RDS, kitchen and sleep timers, USB upgradeability, a custom display with status icons, mute control, 20 combined DAB and FM presets, and support for the rechargeable ChargePAK battery pack. It also includes the Intellitex feature.

Intellitext gives listeners on-demand access to DAB extended text broadcasts, for the latest sports and news headlines.
The broadcaster sends specially formatted scrolling text, and ONE categorises and stores it for retrieval at the user's convenience, the unit even keeps tracking text messages when in standby.

Battery life for portable Digital radios has been an issue. The power drain needed to drive the more sophisticated processing of a digital set-up has left many radios struggling when away from a mains source. However progress is being made and the ChargePAK rechargeable battery pack available separately to partner the one (and other Pure Digital products) delivers around 20 hours of portable DAB listening. ONE also offers around 35 hours of DAB listening from six standard C cell batteries. Users can also listen to ONE through their hi-fi or headphones via the stereo output connection.

The company says ONE's attractive price point has been reached not by cost cutting
but by taking an
engineering

The EVOKE-1 Prestige Triband is aimed at the discerning end of the market

led approach to cost reduction. Pure Digital says rather than shaving costs by reducing build-quality, ONE's highly competitive price point has been reached through technical integration of the internal circuitry and components. The casing, the speaker, the amplifier, the display – everything that matters to a user – are all of excellent quality with none of the lower quality components often associated with entry level products.

The maker says it is this engineering led approach which has enabled PURE to reduce the cost so efficiently that it has been able to add a host of features never before seen in a sub-£50 DAB radio.

Colin Crawford says: "We've used our expertise as world leaders in DAB to produce a radio that not only sounds great but is intuitive and easy to use too. UK-engineered by the best DAB radio designers in the business, ONE is a breakthrough in affordable radio enjoyment."

Also available from the company is the PURE EVOKE-3, described its most advanced DAB yet.

EVOKE-3 enables a wealth of enhanced usability features, both from the radio itself and from its fully featured remote control. It brings together the best features of PURE's DAB digital radio range, including ReVu, SD-card support, MP3 playback, tri-band reception, multiple alarms and timers, USB upgradeability, ChargePAK support, SnoozeHandle and EPG. The manufacturer argues EVOKE-3's advanced features are accompanied by elegant, iconic styling and industry-leading sound quality. Like the Bug TOO the unit can use the EPG stream to select and record programmes direct onto an SD card.

EVOKE-3's large, graphical LCD display can accommodate a full block of broadcast text without scrolling showing news, sports results, song titles and more, or a big clock display with the broadcast text scrolling along the bottom. All this plus text and icons showing volume, battery life, signal strength, station name and date/time. The clock automatically adjusts for summer/winter time. The large display is designed to bring EVOKE-3's simple and intuitive menu system to life, enabling easy access to the radio's power and functionality.

Says Colin Crawford, director of product marketing, PURE Digital: "EVOKE-3 is equipped with everything listeners require to get the best out of the ever-increasing range of content now available on the radio."

Sound quality is ensured with integrated full range hi-fi speakers and a bass reflex port for enhanced bass performance. Audio quality has been enhanced with custom designed drive units and active-filters to provide a natural 'direct-from-the-studio' sound. Furthermore, a dedicated DSP audio processor allows users to adjust the sound to their own preferences.

EVOKE-3 is another of Pure products that is 'USB upgradeable' over an Internet connection. Whether it's enhancements to the DAB standard or new features from PURE, the USB connector enables users to keep their EVOKE-3 up to date. Users can also transfer recordings and MP3 files between a PC and EVOKE-3 over the USB connection.

EVOKE-3 also incorporates SnoozeHandle technology. A simple touch of the handle will 'snooze' the alarm, for a user defined length of time. For those late night time-checks touching the SnoozeHandle will light up a full-screen clock. The clear display offers selectable brightness settings and an automatically updated clock, which means owners will never again miss the British summer time clock movement. A sleep button on the remote control makes the radio go off automatically after a selectable period of time.

Other key EVOKE-3 features include line input for iPod, CD, MiniDisc or MP3 device.

EVOKE-3 also features up to 99 presets accessible from the remote control or on-screen menu. Connections include headphone output, stereo line-out and digital optical line-out for recording or connection to a digital speaker system.

Volume Equalisation Technology (VET) means that the EVOKE-3 constantly monitors the audio levels of every station and subtly adjusts their relative volume levels over time. So once users have found the volume setting they like, they can switch between stations without changing the volume.

EVOKE-3 also features a high sensitivity RF tuner module; selectable levels of Dynamic Range Control; user-selectable service ordering; and a telescopic aerial/connector for external aerial.

The Evoke-3 is Pure Digital's most advanced DAB radio

50 years ago

By Keith Wilson

To introduce a major feature on television cameras, the cover of our September 1956 issue shows an interesting, if rather idealised illustration of a television studio. Though the title of the magazine in those days was *Practical Television*, I suspect that very few readers would have had practical experience of working with TV cameras, given their scarcity and high cost.

Nevertheless, the article includes a number of interesting photographs, such as a Marconi BD687 camera with a turret so well loaded with lenses it looks as if it would have been almost impossible to raise it to the horizontal. A similar camera is shown fitted with an enormous box-like zoom lens which is hailed as a British invention. As the first zoom lens patent was filed in the USA in 1902, this claim seems rather doubtful.

Also mentioned is a Pye Orthicon camera with a lens turret which could be remotely controlled by the director. I've never been a television camera operator, but I imagine that having lens selection under someone else's control would make life quite interesting!

What clearly comes across from all of the pictures is the huge size of the cameras. Even if you could have afforded one, you probably wouldn't have had room for it in your house!

A little front heavy perhaps?

Radio Show

Moving on to an area more relevant to the domestic scene, the front cover also promotes a special report about the 1956 Radio Show at Earls Court. All is not quite what it seems, however, as the text reveals that some intrepid journalist had been persuaded to pen this report before the show had actually taken place!

Perhaps that's why the report opens by saying that it doesn't seem likely that there will be any startling introductions at the show. It does however, discuss a new portable receiver from Murphy which had an unusual resin-bonded fibre cabinet and the by now obligatory turret tuner. Weighing in at 28 lbs and presumably being dependent on a decent external aerial and a mains supply, it wasn't quite what you might call a go-anywhere portable.

The show report also mentions the growing use of printed circuits, while cautioning that there had been no announcement of an all-printed-circuit receiver. It does comment that component manufacturers were producing miniature components specifically for printed circuits, some of which had 'special contact surfaces for this use.' While this sounds suspiciously like a very early reference to surface-mount devices, I'm sure the writer must have had something rather different in mind.

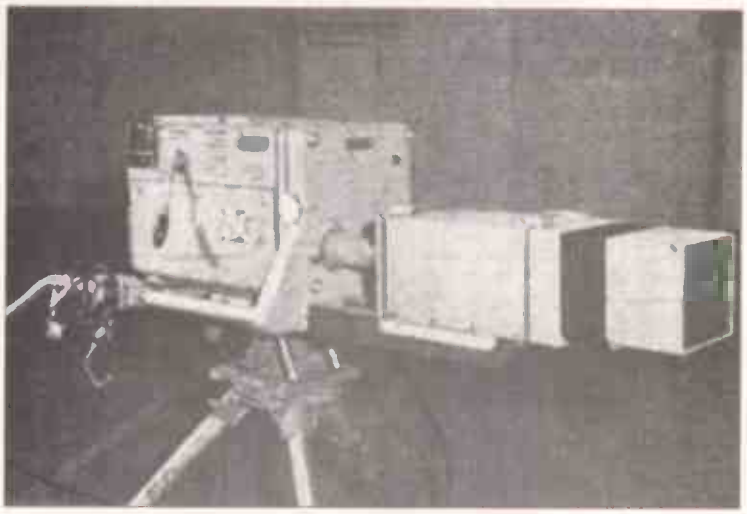
Not quite the Big Brother house!

The paucity of electronic innovations in 1956 seems to have been matched by the lack of imagination in cabinet design.

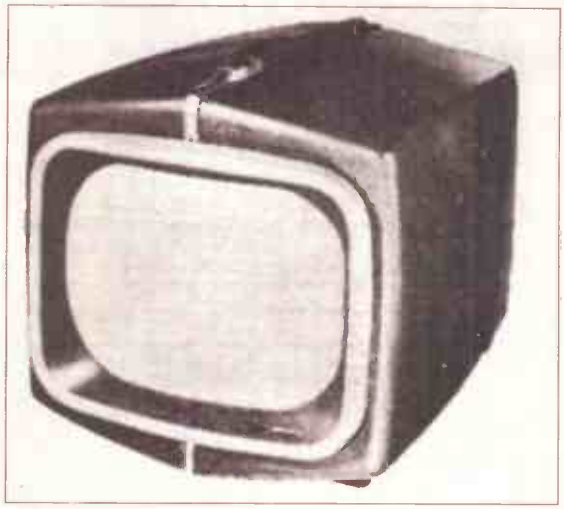
The sets illustrated in the report are mostly of the very boring 'cube with a screen and two knobs variety, although one Sobell set dispenses with the front-mounted knobs to justify the claim that 'the whole front is devoted to the picture area'. Except, of course, that about a third of the set front is taken up by the CRT mask and wood surround.

Commercial TV struggles

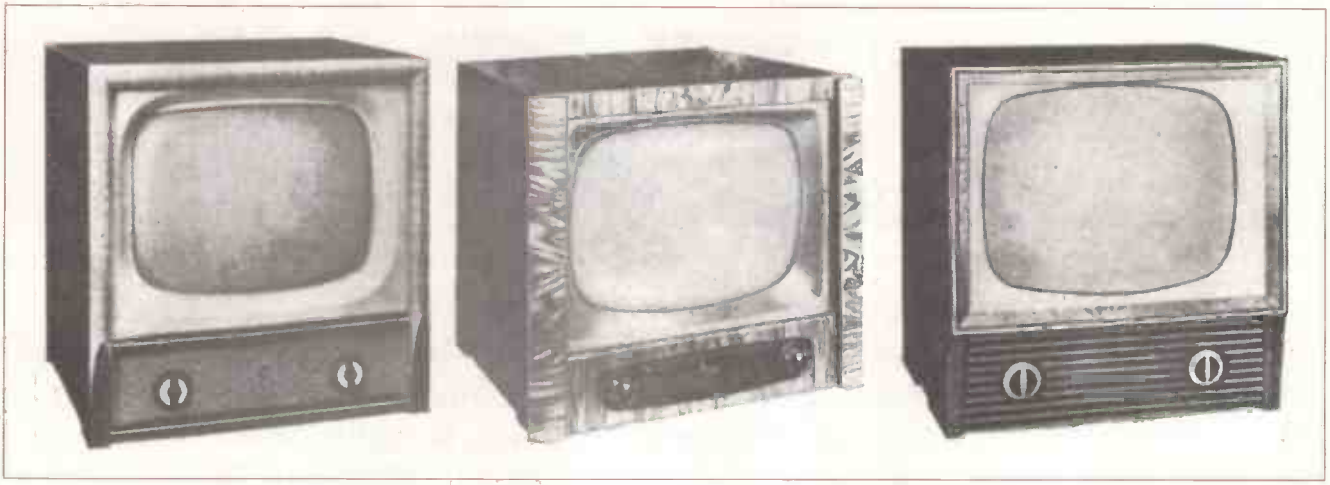
An intriguing item in the leader column states that commercial television is in the red. Apparently, advertising revenues were too low for



British-invented zoom lens, apparently



12-inch Murphy portable weighing a mere 28lbs



Alba, RGD, Ferranti – no design awards here

the contractors to make a profit. Part of the problem was that some advertisers felt that 'the fleeting publicity allowed in return for the high price charged per minute is too ephemeral to provide worthwhile returns.' They don't write editorial like that any more!

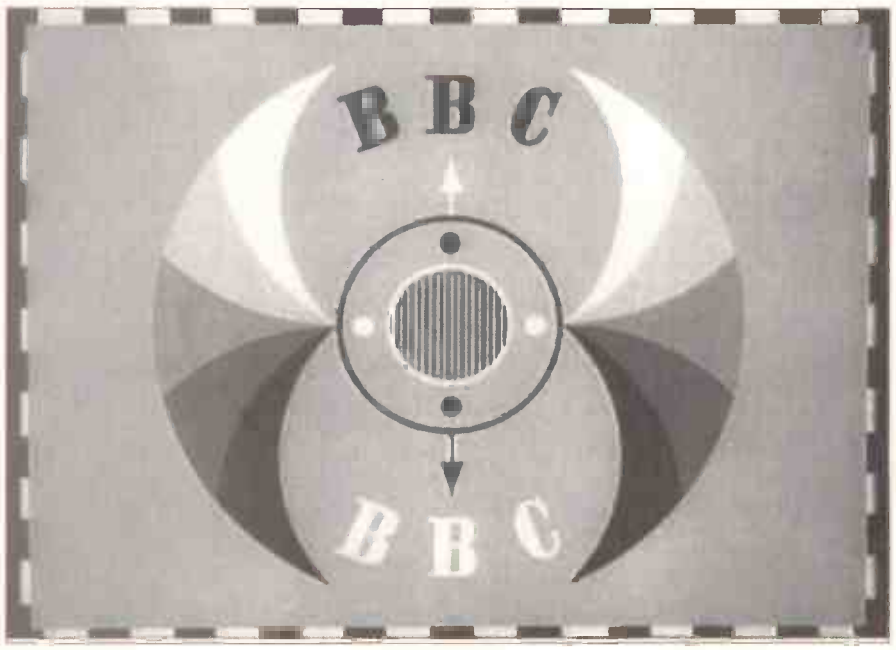
Another problem discussed in the column is more likely to have been the real reason for low expenditure on television advertising. Out of 16,000,000 homes in Britain, only 5,925,000 had television receivers and only 1,600,000 of these had receivers capable of receiving the commercial programmes.

Television advertising in 1956 could only reach one home in ten. The press, the radio (remember Luxembourg?) and possibly even the cinema could do much better.

Also mentioned in the September 1956 issue was a new tuning signal which the BBC had started using on June 16 of that year. This was intended to help viewers make minor adjustments to their sets prior to the start of the programmes.

The item warned against confusing the new tuning signal with Test Card C, which was radiated for the benefit of the radio industry and trade. The implication seems to be that ordinary viewers discovered to be making unauthorised use of Test Card C would have their TV licences cancelled, at the very least!

The BBC bats-wing tuning signal



CEDIA EXPO enjoys successful London debut

The world of Home installation has been one of the fastest expanding areas in the whole of consumer electronics. With consumers wanting more flexibility and features, without the hassle of installing themselves, good opportunities exist for those with the technical confidence and skill to move into this area. Hosted by Cedia (Custom Electronic Design and Installation Association) the Expo (19-22 June, ExCeL London) was designed to showcase the latest kit as well as equip those in the industry with the skills and knowledge to carry them forward

Official figures released by CEDIA showed the 10th Expo (19-22 June, ExCeL London) to be the biggest, most successful training and product showcase event yet for the home technology industry. On its first appearance in London, CEDIA revealed a 30% increase in event visitors with a recorded total of 6,099. This figure included a higher proportion of building specifiers, up 41% to 327, more international visitors, up 81% to 1,031 representing 48 countries, and a huge increase in delegates attending the expanded CEDIA Expo education programme.

CEDIA Expo 2006 featured exhibition stands from over 130 companies in one 6000m2 obstruction-free area at its new ExCeL London home. All the major names from the industry participated, with over 45 companies taking part in the event for the very first time. These included A+K UK, AMX, Arcam, Armour Home Electronics, Artcoustic UK, AWE Europe, Crestron, CSE, Denon, Fujitsu, Future Automation, Helvar, Imerge, Kaleidescape, KEF, LG, Linn Products, Linnsight, Living Control, Lutron, Marantz, Marata Vision, Meridian, Naim, Philips, RGB, Sharp, SIM2, Speakercraft, Technogym, Universal Electronics and USD amongst others.

The organisers argue the high quality and clever design of stands reflected the significant investment made by CEDIA Expo exhibitors in the event. Many featured integrated presentation rooms, on-stand promotions and interactive elements designed to pull in the visitors. They were rewarded with high quality visitor traffic, which was especially busy on the first two days of the Expo. Visitors included a high proportion of installers new to the industry and the event, together with interested attendees from house builders, interior design and architectural practices.

Education

Education is major theme for CEDIA and this year was no different.

The Association says the CEDIA Expo education programme was very well-subscribed with the majority of sessions nearly full or sold-out with standing-room only available for delegates. It included 24 brand new and 20 updated courses, and in total provided an 82% increase in training over last year's event, together with 32 manufacturer product training sessions.

Among the most popular highlights were courses on high definition, new technologies, digital rights management (DRM), what women want, selling to rich people, the two-day home cinema workshop and the one day project management workshop. Installer Level 2, on offer for the first time outside of CEDIA US, as part of the CEDIA certification program also proved a success, with 19 delegates sitting the examination.

Additional features at the show also addressed design professionals. In three CEDIA educational areas, visitors were guided through a typical

project process, demonstrating how a custom installation company can successfully interact with a project team/client. A Designer's lounge and resource centre at the core of the show provided a further opportunity for architects, interior designers, house builders and other specifiers to find out more information on the electronic home and the benefits of working with CEDIA members.

Debut for awards ceremony

2006 was also the first year the Expo hosted its own awards ceremony, designed to recognise excellence amongst its members.

The winners received their CEDIA Award trophy in an informal ceremony at the chairman's reception on Tuesday 20th June.

"I am delighted to announce the winners and finalists in the first-ever CEDIA Zone 1 Awards", said CEDIA Chairman, David Hyman, speaking at the Chairman's Reception. He added: "We received over 40 high quality entries for the four main installation categories open to ESP members, from members working in the UK, Europe and the Middle East. The judges then went through a very difficult process to select the final three and an eventual winner in each installation category".

The inaugural CEDIA Awards featured six categories in total. 'Best CEDIA Installation under £20,000', 'Best CEDIA Installation over £20,000 and below £100,000' and finally 'Best CEDIA Installation over £100,000'. The awards recognised the quality and innovation in the design and installation skills of CEDIA members at both the lower and upper end of custom installation market, whilst the 'Best Multi-Dwelling Installation' category rewarded the talents of CEDIA members working with property developers and house builders.

These four Awards were judged by an expert panel, comprising Julian Wilkinson, from award-winning residential architects, Wilkinson King, Diana Yakeley, chair of the British Interior Design Association (BIDA), Garry Mason, editor of idFX, Chris Price and Dave Murphy, freelance technology journalists.

The 'CEDIA Award for Best Supplier' was given to Pulse Marketing. Judged by CEDIA ESP members in an online vote, via the CEDIA website, this category was open to all CEDIA Trade Supplier members and recognised the top manufacturer or

Winners and finalists

Best Installation Under £20,000

1st Laservision - Art Deco Cinema

Finalist Definitions – Stevens

Finalist Definitions – Piercy One Touch Simplicity

Best Installation Over £20,000 and Under £100,000

1st Audiofile – Doherty (Basement)

Finalist Chew & Osborne – Penthouse, New Providence Wharf

Finalist Pounds – Morley Hall

Best Installation Over £100,000

1st SMC – Ad Astra

Finalist Smartcomm – Firoka (Kings Cross Apartment)

Finalist Dawsons – Dorchester House

Best Multi Dwelling Installation

1st Icon Connect – The Knightsbridge

Finalist Intelligent Home Systems – Fountainhall

Finalist SMC – The Phillimores

Laser vision were amongst the winners in the first CEDIA Expo awards.

Icon won a award a the CEDIA Expo for this spectacular install

Expo 06 seminar: Many of the Expo's seminars played to packed houses

HD Gallery: Distributor AWE enjoyed a very successful time at the CEDIA Expo 2006

distributor in the industry. Judging criteria included the standards of service, support, product innovations and training provided to members. The final category, 'Best Stand at CEDIA Expo 2006' did not require a formal entry, and Linn was judged at Expo as the winner by Phil Jones, director of the AEO (Association of Exhibition Organisers).

Previous to the Expo event CEDIA had also been one of the main participants in the Grand Designs Live event (2-4 June, ExCeL London) which attracted over 50,000 visitors in total. The CEDIA–sponsored 'House of the Future... Today' proved to be one of the most popular at the event.

Located at the heart of the GRANDInteriors Hall, the exhibit consisted of a three room, working showcase for custom electronic installation. Each day scripted actors put the various smart technologies in the house through their paces as they moved through the different areas of the house, simulating the everyday activities of a modern family. CEDIA says these demonstrations played to packed and enthusiastic audiences and provided a powerful, educational display of the many benefits which electronics can bring to the modern home.

The feature was also hailed as a great success by Channel 4 TV presenters Kevin McCloud and Naomi Cleaver. The stars of TV's 'Grand Designs' and 'Honey I Ruined The House' both took time out from their busy event schedules to visit the feature, talk to the actors and CEDIA representatives and find out more about the lifestyle, interior design, energy-saving and other advantages of custom electronics.

"Audience response to 'The House of the Future...Today' has been very positive" says David Hyman, chair of CEDIA. "It has crystallised a way of life for visitors to the show, allowing people to experience and aspire to the exciting lifestyle possibilities afforded by integrated electronic technology. We have attracted a high quality audience for the demonstrations each and every day, generated considerable awareness for our industry and received numerous enquiries for the services of our members. We're delighted and our thanks go to all the CEDIA members who helped make this feature such a resounding success".

The 'House of the Future...Today' demonstrated a range of custom electronic technologies. For example, it showed how a hi-fi system can breathe beautiful music into every room through unseen loudspeakers, which were cunningly disguised as artwork representations of Channel 4 presenters, Kevin McCloud, Sarah Beeny and Naomi Cleaver. It also showed how a plasma TV could be concealed behind a wall, then revealed at the press of a wireless touch panel button, and used to deliver music and movies without a CD or DVD in sight. Operation of these systems can be completely integrated with automatically closing blinds, temperature and light levels. Home networking, telephones, security systems and other equipment can also be integrated and operated via a simple touch-panel.

Company success

One of the companies particularly pleased with this year's expo experience was AWE Europe, UK distributor to the custom installation trade for a wide range of high quality brands, including Pioneer, Cineversum, Philips, Yamaha, Flatline Acoustics USA, KEF, Panasonic and Denon.

AWE says the investment paid off as the stands were bustling with custom installers who came to take a closer look at the wide range of premier branded equipment on display, including those within the new distribution agreements announced at the Expo itself. Products on show included high-end DLP projectors from Cineversum with the CV70 Ultra shown off in the specially built demo room, an impressive high definition gallery of flat screens from Pioneer, Philips, Panasonic Viera and Sharp Aquos and a wall of high quality CI speakers from KEF and Flatline Acoustics USA. AWE also treated visitors to the first showing of the world's first 1080p plasma from Pioneer, alongside its Excellence speaker system.

Following the success of CEDIA Expo 2006, The Association has confirmed that the event will return to ExCeL London next year, running from 25th to 28th June 2007.

FAULT REPORTS

TV and DVD Faults

Test Case 525 ■

John Coombes ■ Charles Arundel

Philip Salkeld ■ Les Mainstone

John Tennant

Solution – Test Case 525 ■

Model GB20V3NTS (chassis CP185)

GB14C3NTBL (chassis CP185)

Daewoo Model GB14C3NBL (chassis CP18)

Daewoo Model GB20C4NT plasma (chassis CP185)

Daewoo Model DLP3212 (chassis SL210P)

Daewoo Model GB14H2NS (chassis CP062)

Daewoo Model DDT-21H9S (chassis CP093)

Daewoo Model DSC-3210 EGB (chassis SC140)

Daewoo Model DTZ 2881GB (chassis CP520F)

Daewoo Model DP42SP (chassis SP115)

Daewoo Model DP42SP (chassis SP1150)

Daewoo Model DP42SP (chassis SP115)

Bush6693D (chassis 11AK45B5)

Sony KD-32DX100U (chassis AE6D)

PYE 52KV2565/05B (chassis G90AE)

Toshiba 28W33B (chassis 11AK37)

Bush RF6683VPL

JVC AV-28GT1SJF (chassis 11AK45B5)

Hitachi C28W410SN

JVC AV-28GT1BJF (chassis 11AK45B5)

Sharp 51CS-03H

Thomson 28WX41 (chassis ICC20)

Panasonic TX32:PS12 (chassis Euro 9L)

Mitsubishi Black Diamond MD3250PFS (11AK33J2 Chassis)

Amstrad CTV 3028N

Toshiba 21S23B2 (Pacific chassis PTV3606)

Hitachi C28WD2TN (Chassis A7)

Panasonic TX-14B4T (Chassis Z-185)

Panasonic TX-28PK2/E (Chassis Euro 4)

Grundig CUC 5360

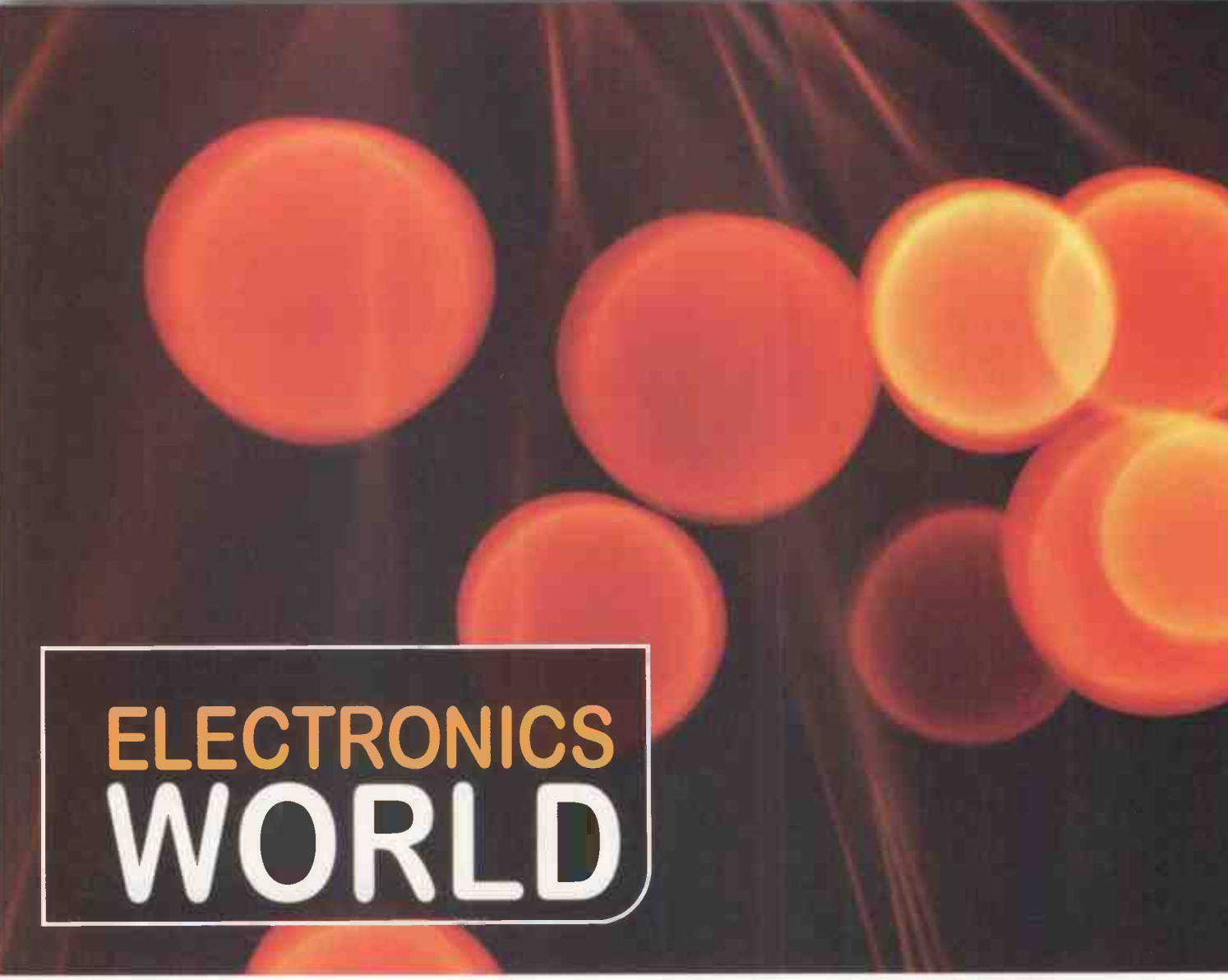
Grundig CUC 5360

Akai SP71L1 / CT2867

Philips VR 630/07

Panasonic NV-HS 820

Matsui 28N03



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John Coombes

Continued from August issue

Panasonic TX-W28R4

Eeprom/memory faults

To reset the memory just press at the same time status button (info) from remote control and P-button which will carry out a self check.

If the set is dead then check the EEPROM IC1102 (27C2001-F18) check by replacement. If the set comes out of standby mode, but the EHT from the line output transformer T551 starts pulsating immediately but there proves to be no failures within the EHT secondary, then this can be tracked down to a faulty EEPROM IC1102 (27C2001-F18) check by replacement. If the set switches itself into standby mode randomly, but then comes back on, check also the EEPROM IC1102 (27C2001-F18) check by replacement. If there is picture foldover but only in the AV3 mode check the EEPROM IC1103 (XGL2-O1LA) check by replacement. If the sound suddenly whistles and the Dolby adjustments can be called in the sound menu, suspect and replace faulty EEPROM IC1102 (27C2001-F18).

Audio faults

The first check is to ensure if there is no sound due to loss of the 29V to pin 10 of the sound output IC251 (LA4282). If the voltage is present, but it is very low, then suspect the sound output IC251 (LA4282) as being at fault. To ensure the LT voltage is not low due to the power supply at fault, just dry-joint the supply pin or pins to see if the 29V then rises indicating the fault is in the power supply or IC251. If after dry-jointing pin 10 of IC251 the voltage remains low, then check capacitor C264 (2200uf 50V) for short circuit. Replace before tracing back to source if still in trouble with low voltage. If there is a loss of channels (left/right) check the audio output on IC251 (LA4282) to ensure right channel is correct on pin 7 and left channel is correct on pin 11. If this proves to be alright then check the loudspeaker left/right and associate connections. If however there is no output check that there is input on pin 2 for left channel and pin 5 for the right channel input. If the input is correct then replace IC251 (LA4282). If the input is not present on pin2 (left) and pin 5 (right) then trace back to the audio processor IC2101 (MSP3410DP0B4) check associate components or DC conditions, if still in trouble it maybe necessary to check by replacement.

If the set is dead but by removing the external loudspeakers the set then comes back on, replace resistor R2702 (150kohms) on the (C) PCB,

Test Case 524

A nine-year-old TV set can be worth repairing! Especially when the owner is attached to it, spare parts are available and there's a good prospect that it will continue to work long enough to justify the repair cost. All those points seemed to be satisfied by Mrs Watson's 29-inch 'squarescreen' JVC TV, which had worked without any failure since it was bought in the autumn of 1997. It had broken down now right enough, though, and to avoid the cost of our collection and delivery (we don't do this sort of repair on site any more) the Watsons had struggled in with it in their little car.

The next day it got onto Real Technician's bench. The fault symptom was given as 'no go'. In fact it did go, but only very briefly before reverting to standby mode by itself. After two or three such cycles the picture-tube heaters had warmed up sufficiently to give some clues as to the cause of the fault. Rather obscure clues! The screen lit for only a second or two with just the upper third of the display area alight – in red! Of the illuminated part the bottom was brightest, and the scanning lines were overlaid there, while those at the top of the ragged red patch were stretched. All this takes much longer to write – and even to read – than it lasted on screen. RT wished that he hadn't picked this one up! He found the service manual (JVC model AV-29SX2EK, JE chassis) with no trouble: a nice printed one, with pages you can touch, feel and turn over....

Our man tried hard to assimilate the three basic symptoms: small, displaced vertical scan; red light on screen; and auto shut-down, the latter probably a function of some overload-protection artifice. The best he could do was to link two of them together in guessing that there was some problem in the field timebase. Get away! He phoned Mrs Watson and gave her a provisional estimate based on replacement of the field timebase chip: there were no signs of dry soldered joints at its legs. The device (IC401, type LA7845N) was not to be found in the stores or in the catalogue of our main spares supplier, so it was ordered from JVC. It came the next day, wow!

With some misgivings, RT fitted the little seven-legged device and switched the set on. Those familiar with our Test Cases will know what happened next: the reappearance of just the same set of fault symptoms as before – of course. Was the diagnosis a bit hasty? Maybe. Was it correct? Or partially correct? Perhaps. Now RT did what he should have done the first time round: he hooked a D.C.-coupled oscilloscope onto relevant pins of the field deflection chip. Starting at the output point, pin 2, he saw that the waveform there was low in amplitude and distorted, also it was much biased above the D.C. zero line. That, he guessed, would account for the vertical displacement of the on-screen image. More probing finally led to the discovery of a faulty component. What do you suppose it was? And why was the short-lived image on the screen red? Without any help from anyone else (for once, did someone say?) RT got the problems solved. See how on page 668.

because the supply line is low at 18V instead of 22V. If there is still no picture or audio and the power supply pulsates, check all the external connectors to the loudspeakers.

If the surround sound output IC2704 (TDA2030AV) is very hot and there is a smell of burning, check diodes D2716 and/or D2717 (2x mA165) check for open circuit. If the set shuts down when the rear surround speakers are connected, firstly ensure there is not a dead short on the speakers or leads making sure there is no tape joins or damaged lead with bare wire showing through the plastic cover. If this all proves to be alright then replace diodes D2716/ D2717 (2x mA165) resistor R2702 (150kohms) IC2704 (TDA2030AN) and IC2701 (STR10006) it is necessary to replace all components listed if there is no fault detected on some components.

The replacement of all components will avoid the ruin of a limited number of components all over again adding cost and time to the repair. In a few cases we have had sound distortion on one channel. To overcome this problem we have replaced the audio processor IC2102 (MSP3410D). Finally in the audio output stage if the audio crackles and the volume varies, suspect and replace faulty audio output IC251 (LA4282). Before replacement ensure there are no dry-joints on the output pins of IC. If there is no audio or picture with a loud squealing noise check for faulty diodes D2714/ D2715 (2x ISS133T7) replace both if only one at fault.

Video/CRT faults

If there is just a blank raster with no video output and DC conditions are correct on IC601 (VDP3120BPPB1) then replace the video processor IC601. If there is blank raster or frame collapse when the channel is changed, check for dry-joints on the serial clock data (SCL) line pin 50 IC1101 (SDA5450C48) micro processor to and from the EEPROM IC1103 (XGL2-01LA) check connections on resistors R1116 (100ohms) and/or R1121 (100ohms). If there is weak contrast this can be due to high resistance resistor R558 (120kohms). If this proves to be negative then suspect the video processor IC601 (VDP3120BPPB1) check the DC conditions or check by replacement. If there is a loss of picture and no on screen display suspect faulty micro processor IC1101 (SDA 5450C48) check the DC conditions or replace. Also if the video processor IC601 (VDP3120BPPB1) is at fault it may not let the set start-up from standby mode. The LED will be lit when in standby mode but the set just switches off after trying to operate.

If there is no red this maybe due to faulty transistor Q351 (2SA1767) check by replacement.

If still in trouble then check the red CRT heater this maybe open circuit. If this also proves to be negative then check the RGB output IC351 (TDA6103QN3) check the DC conditions very carefully or just replace. No green, check transistor Q352 (2SA1767) and/or no blue Q353 (2SA1767) check DC conditions. If this proves negative then IC351 (TDA6103Q-N3) should be replaced. If there is excessive red, blue or green suspect CRT as being at fault. If the set is dead, this maybe due to protection mode operating due to a fault internally in the CRT. In some cases if there is a blue picture intermittently with flyback lines where the set then trips after a few seconds, this is due to a faulty CRT. Due to cost of CRTs this would make the job beyond economical repair.

Tuner/IF fault

The first check with a tuner fault is for noise on screen, if there is noise on screen then suspect faulty tuner unit TNR001 (ENG275066). Before condemning the tuner unit check that all DC conditions are correct to tuner. Also check for dry-joints if this is an intermittent fault on the pins or internally on the aerial socket. Check that the aerial socket is correctly soldered on the earth side to the tuner body, this will also give snowy pictures and poor quality sound. If still in trouble then check the supply voltage to the tuner unit, if this is missing then trace back to Q850 (2SD2396) check for dry-joints or open circuit. At this point ensure there is a tuner IF fault by inserting a signal in the SCART to eliminate all other possibilities. If the tuner unit proves to be alright then check the EEPROM IC1103 (XGL2-01LA) check by replacement. If set still at fault, check that the 33V line is present on the tuner unit, if this is missing check resistor R112 (100ohms) for open circuit or check also resistor R113 (22kohms) for high resistance. If the centre pin connection to the tuner unit is broken, this may require the addition of a piece of wire to remake a good connection on the tuner PCB. If there is no signal and this only occurs on certain channels, suspect and replace leaky SMD transistor marked BR inside the IF section on the tuner unit. The type of SMD transistor to use is (MSB1218ART1).

Teletext faults

If there is no text after start-up when the set is cold, check the micro processor IC1101 (SDA5450C48) check by replacement. If this proves to be negative, check if the text is missing or corrupt due to the crystal X1101 (TSSA121) and that it is running at 6MHz. If incorrect, then check for dry-joints or by replacement. If still in trouble check the associate components capacitors C1103 (22pF) and/or C1104 (22pF) check by replacement.

Miscellaneous faults

If the east-west correction is incorrect check that the 27V is present on pin 6 of IC701 (TEA2031A). If this is missing, check the fusible resistor R701 (100ohms) for open circuit. If the voltage on IC701 pin 6 is correct but IC701 (TEA2031A) keeps failing, then it is necessary to replace coil L701, which should read about 7.3ohms. If the coil and IC701 are both alright check for faulty Q701 (BC857B) check by replacement.

If there is no colour through the SCART connection but it does operate correctly on RGB suspect faulty EEPROM IC1103 (XGL2-01LA) check by replacement.

If there is no picture on AV1 or AV2 but the sound is operating correctly suspect a faulty video processor IC601 (VDP3120BPPB1) check the DC conditions or replace.

In a few cases we have had excessive brightness due to faulty video switching IC3401 (TEA 2114) check by replacement.

Remote control faults

The remote control is very reliable and tends not to give to many problems on this set. The usual problem which haunts nearly all remote controls is the battery connections. If the battery contacts become corroded due to battery leakage, this can cause no operation or intermittent operation of all functions. One of the worst problems is were the battery contacts have corroded so badly that they just fall apart leaving a replacement the only option. They can also develop dry-joints which prevent the voltage reaching the remote control PCB. The last of the faults on this remote control can be dry-joints on the LED usually by re-soldering normal operation is restored.

Charles Arundel

Daewoo faults

Model GB20V3NTS (chassis CP185)

This set was dead. The fault was traced to a short circuit D806 BYV95C in the power supply.

GB14C3NTBL (chassis CP185)

A faint whistle could be heard coming from the speakers during adverts.

This is due to a software bug in the video processor IC I501.

To cure the problem the IC has to be replaced with a modified version type TDA9361/N2.

After you have replaced this IC, you probably won't be able to receive any signals after attempting an auto search, or if it does tune in channels there may be no sound. This is because you have to ensure that you have reset the tuner and system options after putting the set into service mode.

To access service mode first select programme number 91, then adjust the sharpness to minimum and exit all menus.

Now quickly press the following sequence of buttons on the remote control; red, green, menu.

Now toggle down to the tuner option and enter the code for the type of tuner in the set. This is written on a label on the tuner.

For example the code for Daewoo/Samsung tuner is DW and the code for a Philips tuner is PH1 or PH2 (try both).

Once this has been done, you must choose the correct system option for the UK. Toggle down to the system option whilst still in service mode and select the code for PAL I/I which is TU.

You should now be able to auto search all channels.

However, it may also be necessary to replace resistor circuit reference R527 with a 620ohm 1/6W from it's original value of 430ohm to correct the contrast level.

Model GB14C3NBL (chassis CP18)

This set had no sound. This was traced to C570 4700pF in the phase lock loop circuit breaking down under load.

Model GB20C4NT plasma (chassis CP185)

This set had no picture. The HT was down to 10.8V and there was no line drive. The fault was caused by a faulty EEPROM.

Model DLP3212 (chassis SL210P)

This is a high definition model with a DVI input and separate 3.5mm jack socket for the sound. When a TELEWEST cable box installer tried to install the customer's new HD cable box, he found the TELEWEST box only had an HDMI socket, so he had to leave without completing the installation. The answer to the problem was to provide an HDMI to DVI lead for the reception of the high definition picture and a separate left and right phono to the 3.5mm jack lead for the audio.

Model GB14H2NS (chassis CP062)

This is a VCR/TV Combi machine. The complaint was a mechanical whirring noise and clicking coming from the machine when in stand-by mode.

This noise was found to be caused by intermittent operation of relays, which feed the head drum motor, causing it to spin up intermittently.

The cure was found to be a necessary modification to remove transistor Q837 and short circuit it's base to collector.

However, later type version 03 chassis have already had the transistor removed, so suspect a faulty Thyristor circuit reference I822 type X0202DA

Model DDT-21H9S (chassis CP093)

The fault symptom here was intermittent sound. A dry solder joint was found on capacitor C415.

Model DSC-3210 EGB (chassis SC140)

The complaint was a very faint 50HZ buzz from the left hand speaker when the volume was set low. It did not vary with any volume adjustments.

The cure was a modification to the ground points.

Fit a piece of insulated cable between two the ground points of P703 and of I602 (pin 15 of the sound amplifier).

Model DTZ 2881GB (chassis CP520F)

This set was dead. The LED went green but there was no picture or sound.

The fault was due to capacitor C430 680pf 2kV going short circuit. Unfortunately this also damaged resistor R420 10kohm 1/4W and diodes D520 and D521 type 1N4148.

Model DP42SP (chassis SP115)

This is a Plasma monitor with a separate tuner box to receive TV.

The fault was a black band down the right hand side of picture. This is usually due to a faulty drive IC connected to one of the flexible connectors attached to the screen.

However, in this case it was due to a bad joint on a surface mount capacitor CCC2, situated on the lower left connector board. This joint had been arcing and eventually burnt the printed circuit away. The complete board had to be replaced.

Model DP42SP (chassis SP115)

The fault symptom was small black elongated dots evenly spaced across the whole picture. The fault was eventually traced to a faulty video PCB.

Model DP42SP (chassis SP115)

The screen produced a band of vertical coloured bars on the picture and the remainder of the picture was solarised (looks negative).

This is usually a video or digital board fault, but unusually in this case it was one the ICs on the lower scan board.

Phillip Salkeld

Bush6693D (chassis 11AK45B5)

The customer complained he had lost some of his digital stations. I called to the house and when I discovered Channel 5 analogue was very snowy, I had no hesitation but to tell him the aerial was faulty. Typically, he would not accept what I was saying. Next step was to suggest that we try his set on one of his neighbour's television aerials. This I did and then putting the set into auto-tune revealed all the stations. The things you do to please a customer! While I was doing this he mentioned that when he put the set into standby the red circular light blinked a few times, then there was a flash on the screen and then the standby light remained constant. I had not come across that before, so I agreed to investigate and phone him the next day. I contacted Victor at Bush Technical, who told me that this was normal. When you place the set into standby, the digital side of the TV re-sets itself for the next time it is brought out of standby.

Sony KD-32DX100U (chassis AE6D)

The customer complained that the set would not come on first thing in the morning, but when it did spring to life it would work perfectly for the rest of the day. When I put this set on the bench I just knew it would become a real headache. The symptom was a blank raster with a coloured humbar going up the screen. Then after about 20 minutes the sound and picture would come on. Flexing boards and tapping around for dry joints was a waste of time. I decided putting a call into Sony Technical may be a good idea. The person I spoke to informed me this was a known fault. I needed to replace Q4003 and Q4004 2SK2036 which are both surface mount transistors P/no. 8-729-028-28. As this is a heavy beast I kept it on the bench, ordered the two items and waited for their arrival. Sony spares are quite quick and when they arrived I lifted the main printed circuit to find them. Using a magnifying glass I scanned the board, but they were nowhere to be seen. After admitting defeat, I phoned Sony Technical again. I spoke to a different person this time who also knew of this fault and he explained that these two transistors are under the digital can. He went on to explain that when you remove the can and the digital boards, there is a metal strip secured by 7 solder tacks onto the main board and when you remove this metal strip you will see the two surface mounts. Two hours later the parts had been replaced and I had replaced the covering components. This restored the set to a working condition. I have said it before and I will say it again I dislike Sony TV's.

PYE 52KV2565/05B (chassis G90AE)

This set belonged to an old age pensioner who was not interested in a new wide-screen, LCD or plasma television, so the instruction I was given was to do my best. The fault was a plopping noise coming from the set and then after 10 minutes the TV would burst into life. Fortunately, I've had this fault before many moons ago. The problem is where the back of the set joins the cabinet. The printed circuit board bends and a number of surface mount components in the line and power stage become dry jointed. Removing the board, turning it upside down and soldering them is all that is required.

Toshiba 28W33B (chassis 11AK37)

I put this set on the bench for my last job of the day, the fault was that the picture was too wide. This fault I have had numerous times before. The problem is that the 12nF capacitor in the east-west, which is found behind the line output transformer, is short circuit. However, after replacement the picture was still too wide. The next day with a clear head, I started to check the east-west stage, eventually I checked D606 UF5407 which read strange in circuit. On removal it had the normal forward resistance, but its reverse reading was 8kohms. After replacement all was well.

Bush RF6683VPL

This customer had four of these sets from the dealer before we were involved. The complaint being that on pre-recorded tapes the picture was pulling at the top of the screen. It reminded me of the problem that used to occur a number of years ago where you had to use a pre-designated channel number to correct it. The fault was also on SCART. The remedy is to go into the menu, select picture and come down to VCR mode and put it into the "ON" position and store it.

JVC AV-28GT1SJF (chassis 11AK45B5)

This set came in with the usual problem, geometry and the 4:3 mode blanking out, which of course is the EEPROM IC502. The original EEPROM was a 24LC16B which JVC supplied and was fitted with the minimum of trouble. Later on JVC started to supply 24 C16A which again cured the fault, but setting the geometry in the different modes took much longer. Now they are supplying a new EEPROM to fit with a new CPU, fortunately when you go to the service menu JA129 is displayed. This software is what has been used in the UK. The action to take is to fit the EEPROM as normal and replace micro P/no VE-20235966 at the same time. A further note on this update procedure is that you also have to change R278, R279, R280 P/no VE-30012673. Failure to replace these three surface mount resistors will result in a dark, lack of contrast picture.

Hitachi C28W410SN

The customer complained that there were lines on the screen and then the set would close down into standby. Lines on the screen put me off soldering the usual dry joints on the regulators which are on the huge heat sink down the centre of the main board. Soak test bench was the best option and after a couple of days the fault showed up

with white flyback lines and then the set would go into standby. Tapping the CRT base would instigate the fault. A mass soldering job on the base failed to put matters right.

Cleaning the tube socket was the eventual solution.

JVC AV-28GT1BJF (chassis 11AK45B5)

The reported problem with this set was that the customer dropped it when he was moving it from one room to another. After removing the circuit board from its plastic frame, I noticed a nasty crack on it. The broken print in the power and line stages was across the fine print so rewiring was out of the question. The only option now was to phone JVC spares to see if a board was available. The man I spoke with informed me that there was a pink label on the board and the middle number is the part number, VE-20120603 at £87.30 + VAT.

Les Mainstone

Sharp 51CS-03H

The customer complained that this set would take four to five minutes to warm up. Sure enough after the allotted time and some squealing from the set, firstly the sound then the picture appeared. I turned my attention immediately to the group of capacitors serving the secondary side of the power supply. Although visually there were no suspects, C712 (220mFd, 25V) put its hands up, it read 94mF on the capacitance meter. Replacing it cured the problem.

Thomson 28WX41 (chassis ICC20)

This 100Hz television worked perfectly for some hours on the soak bench, despite the work sheet indicating that the set would fail after only a few minutes. Eventually it decided to misbehave, switching to standby. I tried to restart it using the remote and was rewarded with the front LED flashing 2 followed by 7 indicating a problem in the frame or line circuitry. I stripped out the main PCB and had a good look around the print. I removed capacitor CL033, after noticing a hair line crack around one of its legs and checked its value. It read OK on my capacitance meter but I replaced it to be on the safe side. After tidying a few more suspect joints, I reassembled the set and gave it a long soak test before returning it to its owners. Unfortunately the set bounced after three days, this time however the line output transformer admitted its failure on my tester. A replacement cured the problem.

Panasonic TX32:PS12 (chassis Euro 9L)

Thank goodness for my hydraulic lift to help this heavy beast onto my bench. I quickly traced the dead monster's problem to Q551, the line output transistor (2SC5905). After a thorough voltage and resistance check I signed this one off.

Mitsubishi Black Diamond MD3250PFS (11AK33J2 Chassis)

Another heavy brute displaying no signs of life arrived. A quick check around the power supply revealed a short circuit Q102, (P6NC60FP or 2SK2645). The following were also short circuit, D140 and D141 (BA159/BY228), C115 and C118 (220pF, 1kV). After replacing the above, I also changed IC106 (MC4460B) and R100 (1ohm, 5W). The set then behaved normally.

Amstrad CTV 3028N

One of my quickie checks with any dead set revealed this fault in moments. After checks for shorts in the power supply and line stage revealed nothing, I monitored the voltage on the main smoothing capacitor. Normally if the power supply has failed at switch off, the capacitor maintains a heavy charge. On this set however the volts returned to zero immediately at switch off, this indicated a faulty capacitor. Replacing this cap (C105 100Mfd 400v) cured the fault.

Toshiba 21S23B2 (Pacific chassis PTV3606)

The line output transistor Q401 (2SD2499) had shorted on this one because of dry joints on the legs of T401, the line oscillator transformer. Q501 (2SK2651) also gave up, along with R509 (0.22ohm), and D528 (MTZJ18D). After replacing the above and thorough checks, the set behaved itself at switch on.

John Tennant

Hitachi C28WD2TN (Chassis A7)

Whilst on test after the usual mass solder up, I noticed slight blue smearing to the right of any white or blue in the picture. Of course the fault had not been reported but was sure to be noticed when the set was returned. Fortunately replacement of Q814 BF422 and Q805 and BF423 cleared the fault. These transistors in the blue drive circuitry are located on the tube base panel.

Panasonic TX-14B4T (Chassis Z-185)

This portable was unable to find any stations. A new EEprom IC obtained from SEME cured the problem, but the picture had a distinct lack of height. The service mode can be accessed by selecting channel 99, setting the sharpness to minimum, then holding the down key on the set whilst pressing mute on the remote. The cursor keys on the remote are used to select and adjust. Use the TV/AV button to store and N to exit.

Panasonic TX-28PK2/E (Chassis Euro 4)

East-west distortion was the complaint with this set. Unusually though the sides of the raster were bowed outwards with the distortion so severe that both the left and right hand side were almost semi circular. Fortunately entering the service mode and adjusting the picture geometry provided a cure. The service mode can be accessed by first setting the bass to max and the treble to minimum and then pressing F followed by volume on the TV at the same time as index on the remote. Use the red/green text buttons to step up or down and yellow/blue to adjust. Use the STR button to store after each adjustment

Grundig CUC 5360

The owner complained that the set had been taking longer and

longer to start up from cold and now refused to start at all. Replacing the three power supply primary electrolytics cured the problem, but while on test I noticed an annoying background whistle on the sound. Re-setting the upright nicam panel provided a cure.

Grundig CUC 5360

Intermittent frame roll on this set was cured by soldering all the dearth contacts on the strip that runs around the edge of the chassis. As the customer had also mentioned a very occasional loss of chroma, I replaced the trimmer C5073 on the decoder panel, which is the usual cause of this problem. The set has now been back with its owner for several months with no further problems.

Akai SP71L1 / CT2867

No picture was the complaint with the set. Sound and on screen graphics were unaffected. With no RGB output from the TDA 8366 decoder/jungle IC, the sandcastle pulse at pin 37 of the IC seemed the logical place to check.

Sure enough it looked to be incorrect with a much wider than normal base section. Checking at pin 39 for the horizontal flyback reference pulse (6V) revealed a badly distorted waveform. To cut a long story short, CK 53 12On 63V, a small red capacitor near the LOPT was faulty. It read perfectly on a meter but replacement cured the fault. This capacitor forms part of the pulse feed network from the LOPT to pin 39 of the IC.

Philips VR 630/07

Occasional tape looping was the complaint with this VCR. The quality of some budget tapes and customers using head cleaning cassettes, leads me to doubt whether some faults can be blamed on the machine. In this case however, a close examination of the supply spool soft brake revealed that a V shaped groove had been worn into the felt pad. Replacement of the brake and a lengthy test proved all was well.

Panasonic NV-HS 820

This machine exhibited severe tracking errors with pre-recorded tapes. Examination showed that on loading neither guide managed to reach its locating slot. A check of the alignment marks on the sliding rack and the take up loading arm gear showed them to be misaligned. Removing the grease from the loading arm gear revealed some well rounded teeth. Replacement of the gear plus a clean of the always suspect mode switch provided a cure.

Matsui 28N03

The power supply unit was tripping on this set. HT rectifier diode DP12 BYV 28/600 was short circuit. Replacing it brought the set to life but with a bright white raster and flyback lies. RL18 33ohms in the RGB output supply voltage feed was open circuit. Presumably one fault had led to another, but I decided to give the set a long soak test before pronouncing it fit.

Solution to Test Case 524

Analogue TV sets may sometimes give confusing symptoms when they develop faults, but they usually provide – by their failure mode or the vision/sound effect they show – some sort of indication of where to look for the trouble. This is more than digital equipment generally affords, where there is either no response or output at all; or what you see or hear gives no clues at all to where the failure lies!

The JVC TV, with its analogue circuit and real-parchment manual, was not really a difficult one to fix, given at least a modicum of thought. RT's probings took him to the plus and minus supply lines for the field timebase chip, where he quickly found that the –Vcc supply at pin 2 was missing: the safety resistor FR553 (1R,1W) in its feed from the flyback transformer had gone open, no doubt because of a fault in the now-discarded field scan IC. A replacement resistor (crucial safety component) restored the –13V line, and with it a full and correct field scan. The set no longer tripped itself out now that normal loading and scanning action was restored.

How about the red image? Well, that was a red herring. Within ten seconds the green and blue CRT guns, a little worn and 'lazy', were making their full contribution to the picture.

We welcome reader's fault reports.

Send your reports to: TVeditor@nexusmedia.com

Preference will be given to reports emailed as Word.doc attachments, and reports submitted on CD. Send to: Television Magazine, Fault Reports, Nexus Media Communications, Azalea Drive, Swanley, Kent BR8 8HU

Please do not send handwritten reports. **Payment will be made after publication**

West Midlands edges closer to 100% broadband target

Satellite technology is being used to link up more rural areas of the West Midlands to broadband thanks to a grant from the Advantage West Midlands-funded West Midlands Networking Company.

Homes and businesses in Admington, Warwickshire were recently 'switched on' to broadband, as part of the Advantage West Midlands sponsored Rural Broadband Access Project which aims to provide 100% of homes and businesses in the West Midlands with access to broadband technology.

Communities across Herefordshire, Worcestershire, Shropshire, Staffordshire and Warwickshire will all be provided with access to broadband as part of the scheme.

Part one of the project, the enablement of 24 BT Exchanges with broadband was completed in May this year, taking broadband coverage in the West Midlands to 99.89%.

The rollout of satellite technology by Avanti will have increased coverage to 99.93% by July 2006.

In October following the final phase of the project, 99.97% of premises will enjoy broadband access.

Grants will be available for any households or businesses that still cannot access broadband after this date.

Ian Williams, Manager of the Admington Lane Units said: "Communication is very important in business and having broadband means that we will now be able to communicate on an equal footing with other businesses.

"The estate can now offer a more complete service to tenants and prospective tenants; many businesses nowadays cannot operate without broadband."

Richard Hyde, Chairman at West Midlands Networking Company said: "By the end of 2006 we expect the West Midlands to be the first UK region to be 100% broadband enabled.

"This is a hugely significant milestone that will result in economic benefits for the whole of the region.

"Our task now is to encourage people to take advantage of the broadband technologies available."

Matthew O'Connor, Managing Director of Avanti said: "Avanti is pleased to be involved in making broadband available to even more communities across the region.

"Once broadband is switched on, we will to continue to work hard to ensure all local communities and businesses take advantage of broadband.

"We want everyone to reap the maximum benefit by realizing that whatever you do online, you do it better with broadband - whether you are a local business, homeworker, family or community organisation."

John Maples, Member of Parliament for Stratford on Avon, today congratulated Advantage West Midlands-funded West Midlands Networking Company and their sponsoring of the Rural Broadband Access Project: "From today, homes and businesses in Admington will be switched on to broadband and this will make a tremendous difference to internet access, which the rest of us already take for granted.

"I look forward to the day when quick and cheap internet access is available to all my constituents."

Advantage West Midlands is one of nine Regional Development Agencies in England whose role is to provide leadership and action to create more, better jobs and an improved quality of life for all in the West Midlands.

The West Midlands Networking Company Ltd was established in January 2003 by Advantage West Midlands to deliver the West Midlands Regional Broadband Network (WMRBN) and other ICT projects. WMNC works closely with AWM and the other regional partners in developing a strategic response to the region's ICT needs.

WMNC has implemented AWM broadband initiatives, such as the Rural Broadband Access Project, and will continue to play a leading role in the aggregation of public sector broadband services, delivering an increasingly efficient and enhanced data transfer network system with appropriate network services across the West Midlands to public sector subscribers of the WMRBN. WMNC is a not for profit business, delivering the WMRBN for the benefit of the region, reinvesting any surplus funds back into the WMRBN.

Avanti Broadband is part of Avanti Screen Media plc. It draws on over 9 years of consultancy and service delivery experience in wireless and satellite communications. The Screenmedia division is now the market leader in branded TV services for the High Street Retail market, the Leisure market, and the Bar and Club markets. Avanti Broadband is growing rapidly and through strategic investment in our network we are committed to continuously improving the range and quality of services we offer our customers.

To find out whether your postcode is part of the RBAP enablement programme visit **www.thepowerofbroadband.org.uk**

Left: Matthew O'Connor, Managing Director, Avanti
Right: Richard Hyde, Chairman, West Midlands Networking Company.

Beyond TV ...as we know it

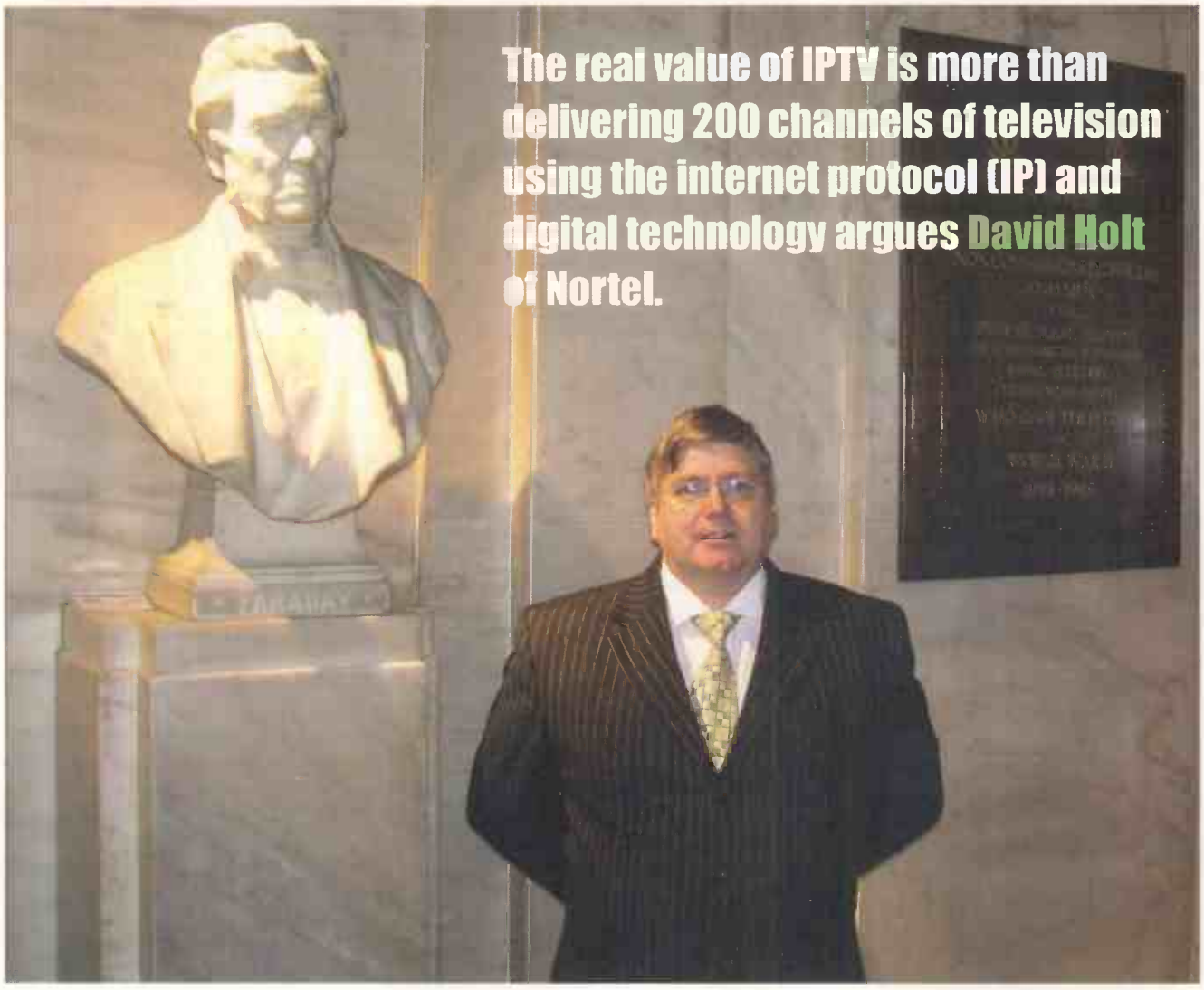
IPTV enables the blending of entertainment and communication services not only on your TV, but also on a multitude of new devices, many of which are mobile. IPTV provides the ability to personalise and interact with video content and deliver new forms of interactive advertising.

The competitive landscape and consumer demand is driving investment in Quadruple Play Services by the competing segments, which now include:

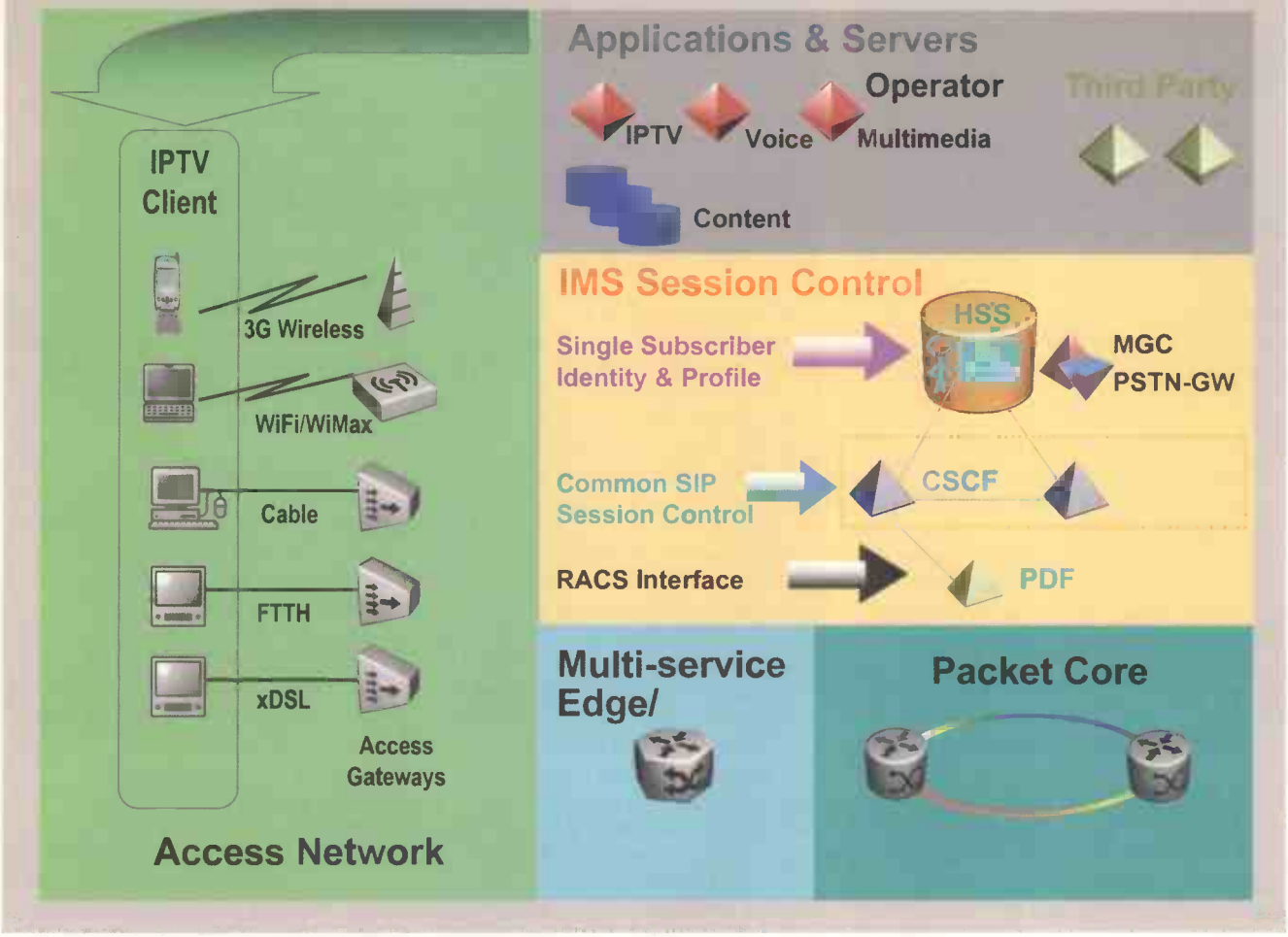
- Media and Content Aggregators (Terrestrial and Satellite Broadcasters, Studios)
- Cable Companies and Multiple System Operators (MSO's)
- Broadband Operators (Incumbent Telcos, Alternate Operators, ISPs)
- Wireless Operators

The potential growth rate of IPTV-ready infrastructure can be seen in the number of broadband consumers in EMEA, a figure approaching 100 million and continuing to grow strongly.

Currently, most residential broadband services offer about 2 or 8 Mbps, but in countries like Japan and South Korea, 100 Mbps services are being introduced.



The real value of IPTV is more than delivering 200 channels of television using the internet protocol (IP) and digital technology argues David Holt of Nortel.



IPTV is transmitted using the operator's private 'business-grade' IP network. Unlike the Internet, this IP network is controlled by the operator and provides the reliability and robustness to ensure that the consumer is satisfied with the IPTV service.

There are several types of networks used for delivering service to the consumer. From an OSI networking perspective, IPTV is delivered using IP (Layer 3) packets with an Ethernet (Layer 2) header. The difference is in the physical (Layer 1) medium.

We subdivide the overall solution into the following four categories:

1. Video Head-End
2. Packet Core, Transport and Network Edge
3. Access Network
4. In-Home Network

Let us briefly explore each of the sub-categories which are illustrated in **figure 1** above.

1. The Video Head-End

The Video Head-End receives broadcast signal media, digitises if necessary, and compresses/encodes these signals, adds in commercials, encrypts the signal to prevent piracy, provides the electronic program guide, and stores the content for video on demand (VoD).

Content arrives from a satellite or antenna in digital or analogue format, with standard or high definition (or music), encrypted or unencrypted. Digital signal acquisition uses an Integrated Receiver/Decoder (IRD) and for analogue signals a demodulator.

Once the signal is 'downlinked' or 'downconverted,' it may need to be altered. Digital signals may need to be converted for use. Most digital signals use MPEG-2 encoding and transcoding to MPEG-4 or Microsoft's VC1 is now available to reduce the required bandwidth by up to 50 percent.

Encoding methods intrinsically produce variable bit rate (VBR) signals, in which 'fast motion' requires more bandwidth. With bandwidth at a premium, the operator usually rate limits the bandwidth that a channel can consume and converts the signal into a constant bit rate (CBR) packet stream.

Cross-conversion may be used to changes the resolution of the displayed picture. For example, a signal received in 1080i (screen size of 1920 x 1080) format may be converted to 720p (screen size of 1280 x 720) or into a mobile friendly format before distributing.

For analogue an encoder digitises, compresses and packetises the signal.

Ad insertion

To perform advert insertion on a digital (MPEG 2 or 4) encoded channel, the upcoming Avail Slot is signalled by a SCTE-35 message signalled in the broadcast. The Splicer uses the incoming signal to trigger the insertion of an Advertisement.

Perhaps the greatest challenge to VoD is the amount of bandwidth required. Consider a network providing 150 standard definition multicast television channels (each requiring 1.5 Mbps) to 3,000 consumers.

Without Video on Demand, the operator requires 225 Mbps (150 channels @ 1.5 Mbps) on the network backbone to deliver television service to all consumers. The number of channels determines the required bandwidth.

If every consumer is watching Video on Demand programming, the operator requires 4.5 Gbps (3000 consumers @ 1.5 Mbps) on the network backbone. The number of consumers determines the required bandwidth.

Because of the bandwidth impact of VoD, understanding the expected penetration rate of VoD service is critical when designing the network. Typically the service mix is 90% Broadcast or multicast TV and 10% VoD.

To most effectively distribute VoD content to a large network we stage the delivery by storing all content at a Super Head End (one or two per country) and then a subset at a Video hub office (one per region) and the small number of high usage videos at a Video serving office (one per central office).

Thousands of hours of content can be stored cost-effectively. However, the cost of content caches, which provide for faster access, remains an important consideration.

Deciding which content to cache - and when to remove content from the cache - and balancing this with the cost of bandwidth is critical.

Conditional access and DRM

High value content is encrypted so that it can only be viewed by paying consumers. Encrypting the signal also protects against piracy. Broadcast television traffic must be encrypted 'on the fly' to protect against piracy and service theft.

Middleware is responsible for the customer experience, access to content and priced offers. It is very much the controller of the IPTV offering and touches many pieces of the solution (STB, services, pricing, channel and rights management, asset management, and billing) in order for it to work. It is responsible for controlling the TV content from the head-end to the TV, including providing the programming guide that is seen on the TV.

2. Packet Core, Transport and Network Edge

The network must have capacity, reliability and QoS attributes to transport massive amounts of simultaneous video traffic from the video headend to Central Offices across the carrier network.

Video traffic has low tolerance to loss and jitter. It also must be kept secure from network attacks and protected from disruption if network failure occurs.

3. The Access Network

The Access Network is usually the bottleneck in terms of capacity to deliver a reasonable video service. Early broadband access networks fall short of the bandwidth capacity and features to support the roll out of IPTV to the home and mobile spectrum has been limited.

The benchmark for IPTV service delivery over Broadband is circa 20Mbps per home base on providing 2SDTV, 1HDTV, voice, high speed data and gaming. In addition, the access network must evolve to include features such a TV channel change and multicasting.

There are several ways to deliver TV and IP-based service:

a) Established broadcast:

Satellite and Terrestrial transmission networks provide an excellent medium for delivering television service to a large customer base cost-effectively. However, a hybrid network is required to enable real time services with upstream components.

Hybrid Fibre Coax (HFC) is used by cable operators. Fibre is used for the first leg of the journey, from the headend to the consumer's neighbourhood.

This is then converted to coaxial cable (coax) for the remainder of the connection, terminating at the consumer premises. Coaxial cable supports high bandwidth and can easily deliver broadcast service, but it is a shared medium which has implications for unicast service delivery (VoD and TSTV).

b) Initial Operator target for IPTV

Digital Subscriber Line (DSL) delivers service across a copper connection, typically using the existing local loop. There are multiple DSL variants, with the ADSL family (including ADSL2, ADSL2+) being the most prevalent. VDSL2 provides reach and speed beyond that of ADSL2+.

DSL is distance-sensitive. Whilst a TV channel can now be delivered over 2Mbit/s most people consider that 20 Mbps downstream is a requirement for offering an array of Video services to the home.

Fibre to the home with Passive Optical Networks (PON) technology is used to deliver service using end-to-end fibre. A single fibre leaves the CO, and a passive splitter in the outside plant splits the signal to support multiple consumers.

Equally effective is Optical Ethernet is used for point-to point connection to consumers. These technologies can also be combined and optical fibre is commonly used to deliver the signal to a DSLAM located in the outside plant to allow sensible bandwidth to be achieved. This is commonly referred to as 'Fibre to the X,' where 'X' is the fibre endpoint e.g. Fibre to the Curb (FTTC).

c) Mobility and Wireless

Mobile and fixed wireless providers are looking to offer Quadruple-play service.

Fixed wireless techniques such as WiMax are being evaluated. Digital Multimedia Broadcast (DMB) and DVB-H (Digital Video Broadcast-Handset) standards have emerged to send television to mobile handsets.

4. In-Home Network

The In-Home Network is the next piece of the puzzle. The set-top box (STB) is the consumer's interface into the network. It translates the incoming IPTV signal into a format that the television can understand. It also converts remote control actions into IP commands for forwarding and decrypts the IPTV signal.

Beyond this point, Service Providers must have a cost-effective means to distribute the new IPTV signal to the consumer TV set, either the existing coaxial cable, existing telephone wire, or newly installed Category 5 (Ethernet) wiring.

New wireless multi-path technologies (MIMO) are also emerging that will eliminate the need for wiring. The key components to the in-home network are the residential gateway (DSL modems for DSL access), Set-Top Boxes, and new emerging devices such as Media Hubs and Media Players. Eventually we will just assign authenticated software to approved devices.

Multicast television

The basic IPTV network must provide similar service and content as satellite or cable networks, including broadcast television, premium channels, pay per view and music - anything which can be sent from a single source to many consumers.

An important enhancement is the Digital Video Recorder (DVR) or Personal Video Recorder (PVR) which provides the ability to 'time-shift' television viewing using a hard disk integrated within the Set Top Box and the IPTV system Electronic Programme guide to record the content.

Video on Demand (VoD) allows the consumer to view content whenever he/she wants, from a library of stored content. Video on Demand is based on IP Unicast streams, which mean instead of

broadcasting a signal to everyone, each consumer now has a personalised channel.

VoD supports a complete set of VCR-like 'trick' functions including rewind, pause and fast forward. Unlike near VoD, true VoD allows the consumer to begin viewing the content immediately.

An alternative model to the PVR, called Network PVR, allows the user to store recorded programs and potentially personal content using storage located in the Service Provider network rather than in the set-top box.

Beyond the delivery of basic IPTV, we should enable more incremental services in a logical order.

First is the Convergence of Communication and Entertainment by adding a Session Initiation Protocol (SIP) based Multimedia Collaboration Client integrated into the STB, which enables key communication services.

The second exploits the industry trend initiated by Convergence (W+, W-, and Entertainment) where a layered functional model delivers carrier-grade service over an architecture that provides converged, ubiquitous and differentiated multimedia services on any access device across any wired or wireless access network.

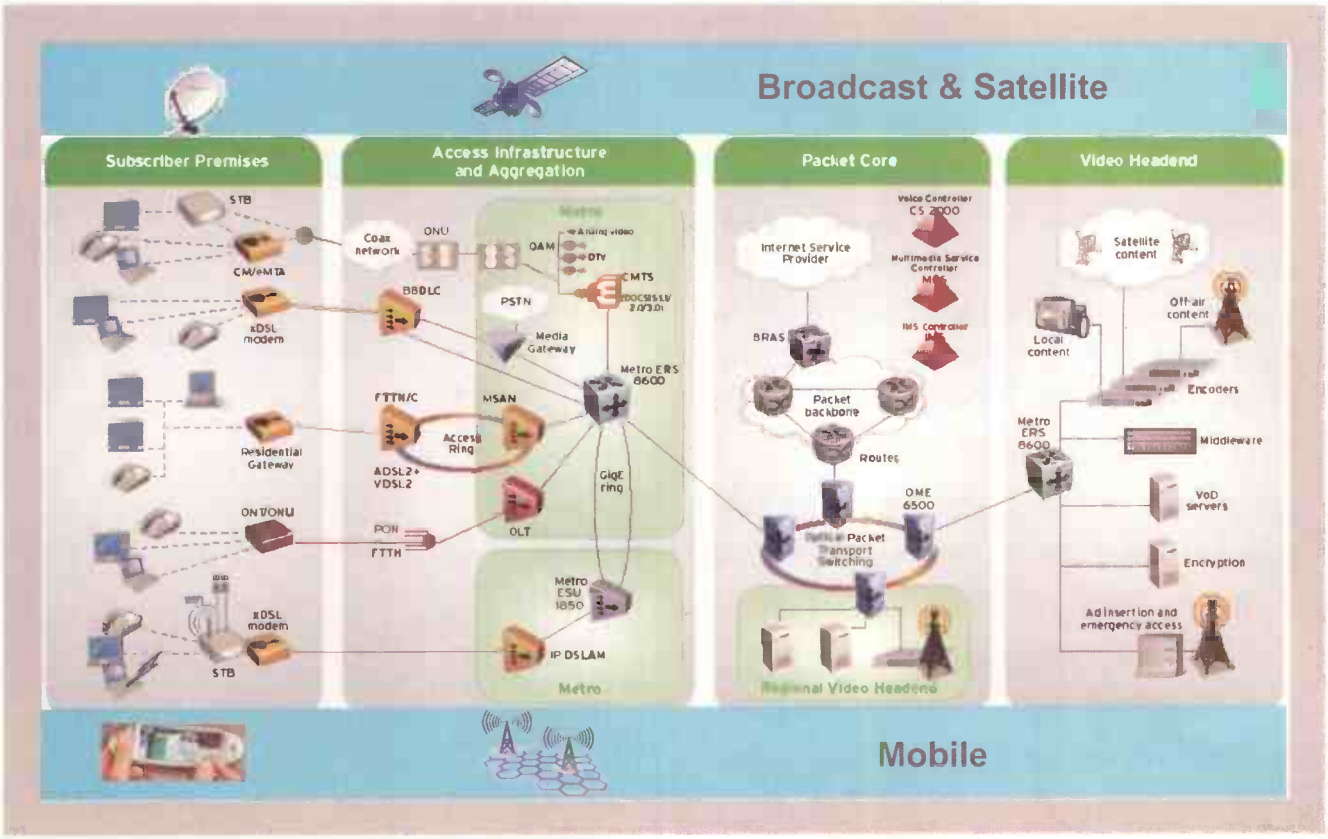
IMS

This is known as the IP Multimedia Subsystem (IMS) which defines a standard framework for the deployment of next generation IP based application services as shown in **figure 2** below.

It defines how these services connect and communicate with the underlying telecommunications network and operational and business support systems. IMS was first introduced as a 3rd Generation Partnership Project (3GPP) Initiative, which has emerged as the de facto standard for all next generation application services.

IMS is an evolving standard and some aspects of it will continue to evolve particularly as it embraces Multimedia and entertainments services delivered with IPTV. The target is migration of IPTV onto a full IMS network where:

- Consumer identity and authentication credentials move from application databases into the IMS Home Subscriber Server HSS. This achieves the ultimate decoupling of consumer from application, device and access network.
- The Call Session Control Function (CSCF) supports highly advanced service control capabilities and provide a common SIP session control mechanism enabling consumer registration from home or visited access networks, session accounting, resource determination and interface to the underlying RACS system and manage application interactions
- The Resource and Admission Control Subsystem (RACS) is functionally decomposed into a common, access independent layer which interfaces the session controllers. This enables access decoupling from the applications and provides a scalable architecture for delivering resource and admission control. The Access specific RACS systems provide the resource control as appropriate for the specific type of access network.
- The Policy Controller provides Policy Decision Function (PDF) capabilities that enables policy enforcement and enhanced billing capabilities.
- The Media Gateway Controller (MGC) and Media Gateway (MG) provide inter-working to the PSTN.
- The Border Control Point (BCP) provides secure interworking of bearer streams to external VoIP networks, extending the service



provider's reach while offering network security and improved quality of service.
- The IPTV Middleware evolves to become an IMS application using SIP to coordinate establishment of the viewing session. In early deployments, existing mechanisms for channel change (IGMP) and CA/DRM function stay as today.

Clients can take on many forms including STB, PCs, Laptops, etc. Ideally, the clients will include the SIP agent for interacting with the IMS control plane and CA and DRM clients for ensuring content protection however in some cases proxies may be utilised to support clients which are not necessarily SIP-ready.

Migration toward a SIP-based session control plane enhances the video anywhere experience. This allows the consumer to use new devices without requiring separate provisioning.

Dynamic exchange of capabilities also enables negotiation to take place for network resources automatically, via the policy controller, to utilise an alternative set of capabilities.

Consumer identity is decoupled from the device and presented to the application in a consistent and uniform manner. Enhancements to resource control enable resource requests and allocations to accommodate upstream video from customer networks.

This enables reliable, high quality remote retrieval of content from the home as well as the ability to make personal content available to family, friends or even the general public

Obviously at the same time the video headed Access and home networks continue to deliver increased storage, speed and sophistication.

Conclusion

The Quadruple Play, especially with the introduction of converged IPTV and video communications, is in the very early stages of becoming the cornerstone service for the Service Provider.

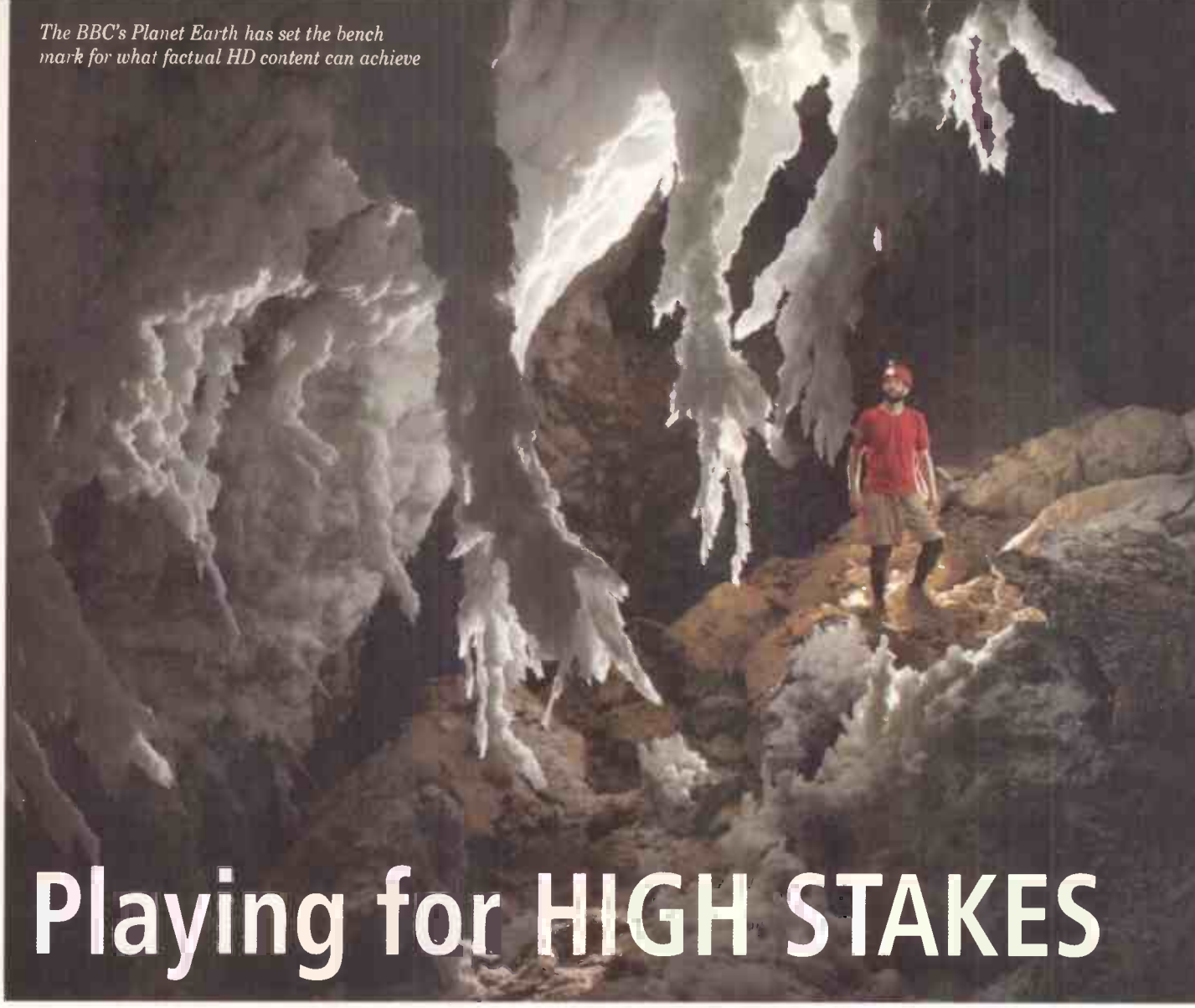
The last mile of any network is instrumental in determining what services can be offered. Initially, limitations in this portion of the network severely restricted service, more recently, technology enhancements have enabled support of bandwidth-hungry applications such as digital IPTV.

The network evolution is a critical part of introducing the IMS wireline/wireless convergence.

Incorporation of new engineering models, compression techniques, multicast and broadcast capabilities, etc. will overcome current limitations on delivery of video services across wireless and mobile networks.

Hence, individualised video services may be delivered on demand to individual consumers, securely and with assured quality over communications infrastructure (as opposed to just a broadcast infrastructure).

IPTV and video communications will eventually be delivered anywhere, with the service profiled to any IPTV-enabled device.



The BBC's Planet Earth has set the bench mark for what factual HD content can achieve

Playing for HIGH STAKES

Content like Wimbledon and the World Cup have got the ball rolling for broadcast HDTV, but the industry needs to keep its eye on the game to maintain momentum, *Television* takes a look at the big picture, by Daniel J Sait

It is too soon to accurately measure the impact this Summer's launch of broadcast HD has had, but the development has to be seen as a big boost for HDTV sales and the continued development of the technology with which to receive and watch HDTV. Ian Rea, product manager, flat-panel TV at Toshiba says: "As an industry we are extremely pleased that BskyB's service is now up and broadcasting as it allows the consumer to view and experience HD for themselves. It is hard to predict how many subscribers will take up the new HD service, but I do understand that BskyB has set itself challenging targets.

"The upside for TV manufacturers is that the sales person on the shop floor can demonstrate to the consumer the quality of HD, and the importance of future proofing their TV purchase."

The BBC itself believes the launch has put in-store demonstration on a new level. Jackie Burdon, publicity manager for high definition at the corporation says: "It is really important that retailers can now show actual broadcast content in-store. HD-box or cartridge delivered content (increasingly offered by manufacturers) is all very well, but broadcast is a different story and a Sky box is currently by far the best way of doing this."

Mark Ebsworth, marketing services manager at Sanyo, also believes broadcast has altered the sales potential of HD: "With HD broadcast now up and running, they (retailers) will be able to really show the benefits of HD technology and HD-ready panels. When you have a HD image next to a non-HD broadcast, it becomes quite an easy sell-up as the picture quality is enhanced to such an extent that customers instinctively know that they just have to have it."

High hopes

Even though the World Cup and Wimbledon are over, there is plenty of content that retailers will be able to use to show that the format is continuing to be

supported by broadcasters.

Later this Summer domestic football resumes and the Barclaycard Premiership and Coca-Cola League will be in HD alongside Rugby union's Guinness Premiership on Sky Sports, with more sports set to join the HD stable later in the year.

Movies will also provide a good source of demonstration fodder as Sky box office HD channels will broadcast up to ten of the latest movie premiers in HD each week. First shown in June, but expected to make more appearances on the format, is Susan's Stroman's fun and colourful version of *The Producers*, whilst those customers with a stronger stomach might appreciate checking out *History Of Violence*, starring the *Lord of the Ring's* star Viggo Mortensen. Also set for showings this summer are *Hellboy*, great for showing rich colour, *Spider-Man II*, unbeatable for showing fast-paced action at HD standard, *King Arthur*, fantastic for demonstrating how HD can get over mood and atmosphere and *Kill Bill Vol 2*, for a straight forward great piece of eye and ear candy.

Popular Sky favourite *24*, which has a good mix of action and tense close-ups to get the most out of HD, will also be receiving the HD treatment in 2006. The addition of *Star Trek Enterprise* to Sky's HD family, with its emphasis on action scenes, will also provide some good content. The National Geographic and the Discovery Channel have also embraced HD, providing demonstration fodder for those customers interested in natural history, culture and science.

At launch the BBC featured of course its World Cup and Wimbledon coverage, but also included drama series like *Bleak House* coupled to natural history like *Planet Earth* and entertainment like the BBC *Proms Concerts*. The BBC's need to provide value for money on the costs for these programmes will ensure that much of this content should make it back onto the HD platform in the form of repeats. Other good news is that both the BBC and Sky will be broadcasting special 'best of HD' loops that retailers will be able to use as in-store demonstration platforms.

Simeon Joseph, product manager, NEC Business Technologies Division, sums up the optimistic mood over broadcast: "Over the next months more and more material from broadcasters will be in HD. As people come to expect the same levels of picture quality they enjoyed with major events like the World Cup, HD will go beyond a handful of Hollywood movies and the odd television broadcast to the mass market."

Not just a game

So things are progressing in terms of broadcast, but the progress of the much vaunted HD-DVD and Blu-ray content is a less happy tale. In truth anticipation for this version of the HD revolution has always been far in advance of the industry's readiness to provide it. A Warner Bros spokesperson tells *Television* that the company has no plans as yet to launch any next generation titles in the UK on either format (it supports both HD-DVD and Blu-ray) and there maybe no titles available at all this year. Most of the other major studios are equally as non-committal, so the industry will have to wait to get their teeth into this part of the HD world.

However, there is another sector that has been quicker to embrace HD; the games industry.

HD games like the Elder Scrolls IV, Oblivion from Take-Two are set to be important drivers for HDTV sales

NEC believes its latest range of XGA PlasmaSync screens are well placed to take advantage of the increased levels of HD content

Sony's Playstation 3 and the Nintendo Wii will be out later in the year, and both are HD ready. The Microsoft Xbox 360 stole a march and launched in November 2005 and has sold solidly with the company needing to ramp-up production to meet demand. The significance of HD gaming for HDTV is not only as an incentive for game hungry family's to up-grade their TVs, but it also offers a great in-store demonstration tool. Neil Thompson, head of Microsoft Xbox in the UK, says: "Many retail customers noticed a significant increase in HD ready TV sales when we launched Xbox 360. Enthusiastic gamers are great consumers of new technology and the delivery of HD gaming with Xbox 360 certainly drove many to adopt the new technology."

Samsung has shown a particular interest in the relationship between HDTV and games. Rob Shaw, product manager CTV Samsung Electronics UK says: "Gaming is a huge provider of HD content. Games are highly colourful and fast moving and HD content allows the gamer to be at one with the game. We have taken this on board at this early stage having a partnership with the only HD gaming console available, the X-box 360.

"We will continue to push this in-store as we have a mode on our LCD and PDP (plasma) range called 'game mode' which was developed in conjunction with Microsoft to provide the optimum HD gaming experience."

Samsung is not the only manufacturer to now recognise the importance of the axis between these two worlds. Rob Bond CTV marketing manager at Philips believes: "HD gaming will have a significant role to play in driving HD because the hardware, software and broadcast content all need to be available for the concept to become mainstream."

Kevin Kelly, director of sales and marketing LinnSight Ltd (Loewe UK distributor) suggests the move to HD for game playing has a particular impact: "As you tend to sit closer to the screen when playing games than when you're watching TV, then obviously higher resolutions are critical. "Computer generated images are never as natural and if HD has one major benefit to the consumer then it is the ability of HD to deliver 'real three dimensional images' and captivate the viewer's interest".

Mr Thompson of Microsoft points out some of the key titles that retailers could use to demonstrate HD: "In the first generation of games that have released on Xbox 360, *Project Gotham Racing 3* and *Call of Duty* would be two games that I'd call out as great demonstrations of HD gaming."

The games industry is also expecting strong sales for titles including *Gears of War, Prey, Bio Shock* and *The Elder Scrolls IV, Oblivion*.

With the amount of HD now available on broadcast, gaming platforms and manufacturer's in-store support systems, as well as the awareness created by this Summer's sport, this is no time for the industry to sit on the touchline, its time to really tackle the prospect of increasing HDTV sales.

Many of Leowe's HD ready sets also feature built-in hard-drives

Playing for HIGH STAKES PRODUCT UPDATES

So broadcast and to some extent disc content is on the way, but what kind of kit are the manufacturers populating this new sector with?

Kevin Kelly, director of sales and marketing LinnSight Ltd, distributor for the stylish German TV brand Loewe, explains that all flat panel products in the Loewe range over 26" are HD Ready. The newest Loewe product line – the Loewe Individual – is a HD ready LCD available in two screen sizes – 26" and 32". Available in five colours for the body of the TV, a choice of nine side inlay panels, five stand solutions and two screen sizes, Loewe's new LCD can deliver a unique variant for each and every customer – Loewe bespoke TV.

Many of Loewe's flat panel products have the option to include an integrated hard disk recorder – Loewe DR+ – on screen sizes of 32" and above. The feature Loewe is focussing most on this year is the Loewe Highlight function. This is a unique Loewe offering that allows end users to produce their own series of highlights by pressing the 'Green' button on the remote – perfect for capturing those crucial moments. The function stores 30 second before an event and 30 seconds or so afterwards on the internal hard disc recorder whilst switching on the picture-in-picture mode, so you never miss a goal or any live event. Mr Kelly adds: "Already we are seeing the consumer awareness in "ultra high" resolution devices which have a native resolution greater than the announced UK broadcast requirement of 1080i and 720p. Displays capable of 1080p will serve to maintain higher prices as they will be perceived as more future proof.

"At Loewe we will be driving our technology hard and with high resolution screens, embedded hard disc drives and HDTV decoders placing ourselves firmly at the cutting edge of our industry."

NEC

Simeon Joseph, product manager, NEC Business Technologies Division explains: "The new HD Ready XGA PlasmaSync screens from NEC range in size from 42" to 61" and provide the highest contrast levels on the market at 4000:1 as well as the brightest screens.

"With cutting-edge split screen and picture-in-picture technology, NEC's plasma screens provide home cinema fans with the stunning entertainment they demand. An aspect ratio of 16:9 offers a real cinema-like experience and they support HD standards 1080i and 720p.

"The new contemporary design means the PlasmaSync range will make a sleek and attractive addition to any living room, as well as offering high levels of visual quality."

Samsung

Samsung Electronics, recently launched its range of SlimFit CRT televisions, comprising of the Z4 HD Ready, and the Z4 Freeview version.

Both SlimFits are 100 Hz, have a 32" screen, with the HD Ready version including an HDMI digital input allowing acceptance of both a 720p & 1080i HD signal.

Usually known for their bulky designs, Samsung says these CRT's defy design principals, with their ultra sleek look, which is slim and visually appealing.

The company says superior colour, brightness, and contrast ratio, mean that Samsung is at the forefront of

Samsung now has an extensive range of both LCD and Plasma HD ready products

redefining consumer's understanding of CRT technology.

Other features include a pure flat screen, multi picture-in picture scan, digital noise reduction and turbo sound across both products, there are also specialised features to the HD ready version such as image scan.

Rob Shaw, product manager Samsung, says: "The SlimFit challenges everything you ever thought about CRT televisions. It is a great looking unit, perfect for people who want more for less. It looks like a flat screen, but the cost is much lower."

This summer also saw Samsung unleash its Q7HD plasma television range, available in 42" and 50".

Rob Shaw, adds: "The sheer size of many of today's plasma screens makes them a stand out piece in anyone's home, however, with the Samsung Q7HD range, we have created a large screen that looks fantastic, but also gives a far superior quality picture."

Samsung says the new duo elevates plasma screen standards, as the Q7HD uses 'Smooth Motion Driver' technology, generating ten additional frames per second, and therefore creating a smooth continuous picture.

With the added benefits of Filterbrigh, a technology which maximises performance in adverse lighting conditions, Freeview digital turner and 13 bit processing, the Q7HD is billed as the perfect blend of advanced technology and aesthetic appeal.

Samsung has not forgotten LCD and the company has expanded upon its range of flat panel LCDs with the HD-Ready R7 LCD family. Samsung says the new sets boast a combination of striking design with meticulous attention to detail, with HDTV, IDTV and Game Mode features.

Rob Shaw, of Samsung, says: "This flat panel has substance as well as style. It is the pairing of different technologies that really sets the R7 range apart. The features in this range mean that we can promise the best quality picture. This is really a premium style product, for a very reasonable price. Offering the ultimate in home entertainment, the R7 range features advanced technology without compromising style and space.'

With HDTV, relaying more visual information on the screen and IDTV, removing the requirement for an external digital receiver or adapter, the product offers consumers the latest in optimal technology.

Samsung says the addition of Game Mode, which provides the user optimised gaming at the touch of a button, SRS TruSurround XT, a powerful sound output of 10W x 2 and a 178°/178° viewing angle allows the discerning gamer or television connoisseur the perfect angle no matter where they are. These LCD's are also PC compatible.

Sanyo

Not to be left out Sanyo has waded in with its Y:TV concept, which is described as a stylish HD ready LCD television with a unique combination of high quality features making it the first of its kind in the UK. Sanyo says Y:TV has a built-in 160GB hard disk drive and is fully HD ready, providing consumers with a future proof solution for emerging technology. It also features time domain surround sound, in-built Freeview decoder and inter-changeable colour frames.

To help retailers communicate these features in-store, Sanyo has included the option to upload a free sales demonstration module onto the hard drive. The 5-minute video will visually demonstrate Y:TV's key features to customers, providing sales representatives with a valuable selling tool.

Sanyo is particularly proud of the Y:TV's built-in 160GB hard disk drive, which delivers Sky+ style control and record options.

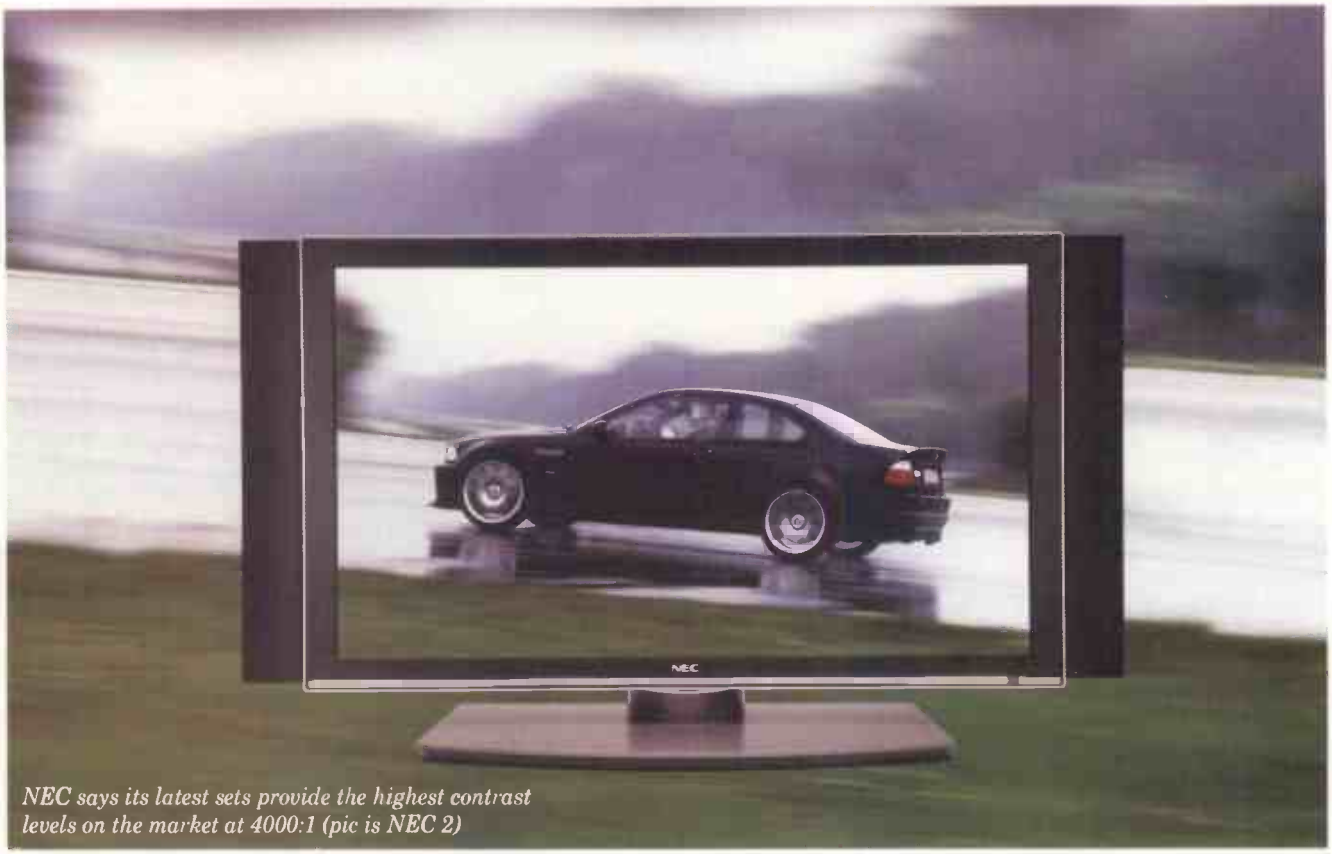
Sanyo also says Y:TV is able to deliver an amazing pure, wide audio sound from just two speakers, providing a sound that is far richer and fuller than from traditional audio systems.

Available with a choice of different coloured frames, Y:TV, says Sanyo, presents a unique opportunity for consumers to change the colour of their television. It can be sold with either a brushed aluminium, black, white, red or blue frame. The frames are easily inter-changeable so that if consumers alter the decor of their living rooms, they can also modify their television to match. A standard tabletop stand provided with the Y:TV is suitable for contemporary low-level viewing, and this can also be upgraded to a glass and steel designer cabinet stand, depending on consumer preference.

Sanyo is also very keen to point out that Y:TV has been manufactured entirely in the UK at the company's Lowestoft factory.

Hitachi

Hitachi points out that its latest Plasma, the 42PD9700, can display 1080i material without conversion or re-scaling and has won several awards in the consumer press. The company says that in keeping with



NEC says its latest sets provide the highest contrast levels on the market at 4000:1 (pic is NEC 2)

all Hitachi's recent sub-50" plasma TVs, the 42PD9700 uses AliS (Alternating Lighting of Surfaces) screen. Unlike conventional plasma panels AliS uses an interlaced approach, lighting the even and odd lines alternatively every 1/60th of a second to double the vertical resolution of a standard VGA electrode without any loss of brightness. Hitachi also says that all its flat panel TVs over 26" in the 2006 product range have a digital tuner. This time last year only one Hitachi model had this facility, thus demonstrating Hitachi's commitment to digital transmissions.

Says Peter Johnson, technical sales manager, Hitachi:

"Consumer demand for HD ready TVs began in earnest with the screening of the World Cup offering dealers a real opportunity to persuade consumers of the need to up-grade to a future proofed TV. Now those who enjoyed the World Cup in HD while others who have not yet done, will be aware that the SKY service with its HD SKY+ box offers a full HD programme with movies, sport and drama programmes all transmitted in stunning detail.

Panasonic

Andrew Denham, general marketing manager of Panasonic UK explains the company has launched a number of HD ready products ensuring consumers can be fully prepared for the arrival of HDTV. For example Panasonic's TH-65PV500 65" HD VIERA plasma is designed for those looking for the ultimate design statement and highly advanced technological features. With an impressive 65" screen, the visible diagonal of the giant screen measures an undeniably striking 165cm, making the TH-65PV500 the most imposing VIERA to date. In the LCD sector, Panasonic says the LXD60 series also prepares the consumer for a new HD world, and the addition of an HDMI terminal ensures that the picture is second-to-none. As with all Panasonic's VIERA range, one of the main features of these new LCDs is the elegant design and arresting looks. With the black and silver finish, their graceful curved base and elegant screen shape, these LCDs are designed to blend seamlessly into any room.

Panasonic has also introduced a HD ready projector, the PT-AE900. Building on the success of its renowned predecessor, the multiple award-winning PT-AE700, this latest model is designed to take picture quality, contrast and brightness to a new high. Featuring an HDMI input, the PT-AE900 is compatible with high-definition digital sources – fully preparing users for a new HD world. The PT-AE900 is also inherently user-friendly and includes the industry's first learning remote control that allows the user to operate home cinema components from a single controller. Panasonic's PT-AE900 is billed as the perfect projector for home cinema enthusiasts.

So that customers can make the most of their HD panels, Panasonic's 2006 DVD recorder range includes up conversion technology. By connecting an HDMI cable to a HD ready TV, consumers can enjoy their DVDs in the highest quality. Users can also enhance other non-HD signals, such as JPEGs from an SD card for improved picture quality.

Toshiba

Ian Rea, Product Manager, Flat-panel TV Toshiba says: "We have recently launched 6 new large screen Picture Frame LCD TV's that are all HD Ready. The models range from 32" up to 47", with 2 analogue (32&37WL66) and 4 integrated digital models – 32/37/42/47WLT66's. All models feature market leading connectivity of 2 x HDMI's. The 42 & 47WLT66's are also market leading as they are full HD Ready with 1080 panels.

A/V eye

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

Sim2 launches new projector Trio

Sim2's new Domino 35 delivers brains and stunning Italian design

Sim2 says the Grand Cinema HT305E deliver higher levels of performance at levels of cost

The Domino D35, Grand Cinema HT305E and Grand Cinema HT3000 projector, mark the latest offerings from this quality Italian brand with a real sense of style.

The company recons the new models reinforce SIM2's position as the recognised world leader in high definition, Digital Light Processing (DLP) picture solutions. The maker says the new trio deliver higher-performance at lower prices than the models they are replacing. Sim2 explains the Grand Cinema HT305E has a patented light engine incorporating superior glass optics and excellent processing electronics, built specifically for the HT305E. The projector also offers increased light output, through the use of a more powerful 150W lamp. The HT305E inputs include a pure digital, uncompressed HDMI HDCP connection, as well as colour control with SIM2's Live Colours Management (LCM). The Domino D35 employs a version of the patented ALPHA PATH light engine also found in the HT305E. The projector employs Texas Instruments' HD2-DarkChip2 chipset, with a native 1280 x 720 pixels resolution (720p) which Sim2 says delivers a vastly improved contrast ratio of 3200:1.

Sim2 says its Grand Cinema HT3000 sets a new benchmark standard for single-chip projectors. Capable of displaying a high definition signal at its native resolution of 1920 X 1080 pixels progressive (1080p) the HT3000 implements the very latest DLP chipset from Texas Instruments. The result, says the maker, is new levels of cinematic realism for genuinely film-like images.

The HT3000 also allies the newly developed 0.95" 1080p single DMD chip to Sim2's proprietary ALPHA PATH light engine. Full 10-bit DSP processing is also used for the first time, offering significant picture improvement.

One thing from the eighties we are glad to see back

After building a fierce reputation in the eighties, Ruark's Iconic speaker is back in the form of the Crusader Mk III, to take its place as the company's flagship loudspeaker.

The company argues that, while still embracing many exceptional elements of the old model, the Mk III implement's new and improved driver technologies and construction techniques.

Laid back but ready to rock, the Crusader Mk III is on a mission to deliver superior sound

The Crusader III's front baffle leans gently backwards to aid time alignment of the drivers and dispersion. The speakers also feature a true three-way design, incorporating a ribbon tweeter, a 7.5cm dome mid-range driver and 18cm composite carbon/pulped fibre woofer.

Ruark says the aluminium ribbon tweeter is a highly evolved design, where the low mass of the aluminium ribbon allows an extended high frequency response and natural reproduction of harmonics. The speaker is driven by an neodymium motor system and mounted on machined alloy faceplate.

The 7.5cm mid-range treated and damped fabric dome driver is mounted on an aluminium former and coil with internal vented magnet system. This unit is designed to provide exceptional dispersion and performance through the mid-band frequencies.

Bass frequencies are handled by a highly specified 18cm treated carbon/pulped fibre woofer which employs a high loss, low reflection rubber surround mounted into a rigid die-cast alloy chassis. Allied to a high flux magnet system and lightweight voice coil assembly, it provides extraordinary control and extension.

The 25mm thick MDF enclosures are critically damped with an internal non-symmetric brace system. Finally a contoured 25mm veneered plinth provides the system with a large footprint designed to deliver excellent stability when used with the adjustable 8mm spikes.

HDTV

A Tutorial by Fawzi Ibrahim

Part Two – MPEG video encoding

In the second part of a series on HDTV, the process of MPEG video encoding is explained in detail

The purpose of the video encoder is to remove non-essential parts of the video signal and perform bit reduction to produce individual video data packets.

Video encoding consists of three major parts: video data preparation, compression and then quantisation and transformation.

Video data preparation ensures the raw coded samples of the picture frames are organised in a way suitable for data reduction. This involves subdividing each picture into one or more slices.

Video data compression is carried out in accordance with the established standards of MPEG-2 for SDTV and MPEG-4 (H.624/AVC) for HDTV. The aim of AVC (advanced video coding) is to make it possible to produce SDTV quality pictures at a bit rate of 1.5-2 Mbps and HDTV at a bit rate of 6-10Mbps. Though AVC builds on the MPEG-2 technology, the two systems are incompatible.

Two major data reduction techniques are carried out in the following order: The first is 'Temporal' (time related) based on prediction and difference frame, hence the more common name 'inter prediction'. It is primarily used by MPEG-2 and MPEG-4/AVC. The second is 'Spatial' and there are two types. Spatial frequency compression is a technique based on discrete cosine transformation of pixel values into coefficients representing spatial frequencies, used by both MPEG-2 and MPEG-4/AVC. Then there is intra-prediction, which predicts the contents of a block of pixels from the previous blocks of the same frame and sends out the difference, used by MPEG-4/AVC only.

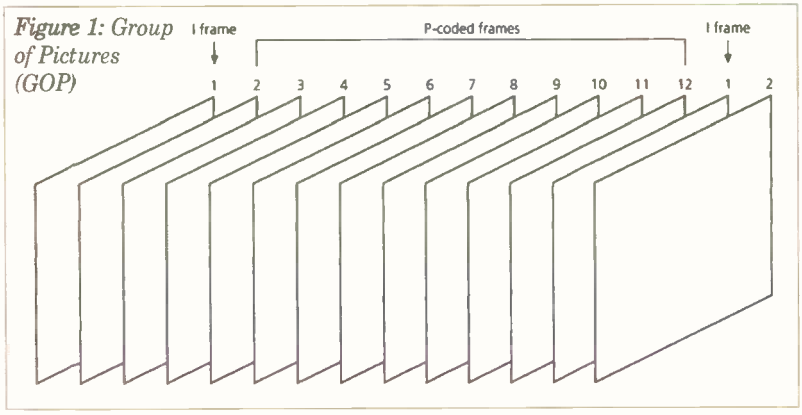


Figure 1: Group of Pictures (GOP)

Temporal data compression

Temporal compression is carried out on a Group Of Pictures (GOP) composed of 12 non-interlaced frames. The first frame of the group (fig. 1) is the reference known as the inter or I frame. The subsequent frames in the group are known as P or predicted frames. Temporal compression exploits the fact that the difference between two successive picture frames is very slight. Thus a 'difference frame' may be sent rather than the full contents of every picture.

The difference frame could be produced by comparing two frames, pixel by pixel. But the large number of vectors needed would increase the bit rate significantly. To avoid this, a 'block matching' technique is used. With MPEG-2 this involves dividing the Y component of the reference frame into 16 x 16 pixel macroblocks, taking each macroblock in turn, moving it within a specified area within the next frame and searching for matching pixel values. Although the samples in the macroblock may have changed somewhat, correlation techniques are used to determine the best location match down to one half-pixel in MPEG-2 and a quarter pixel in MPEG-4/AVC. When a match is found, the displacement is then used to obtain a 'motion compensation vector' that describes the movement of the macroblock in terms of speed and direction.

However, this alone is not sufficient to define the video contents of a picture frame. It may define a moving block but it fails to define any new background that may be revealed by the movement of the block. Further information is necessary. This is carried out by a technique which involves predicting a picture and producing a difference picture known as residual error. This is obtained by first predicting what a P frame would look like if it were reconstructed using only the motion compensation vector and, then, comparing this with the actual frame. The difference between the two contains the necessary additional information which, together with the motion compensation vector,

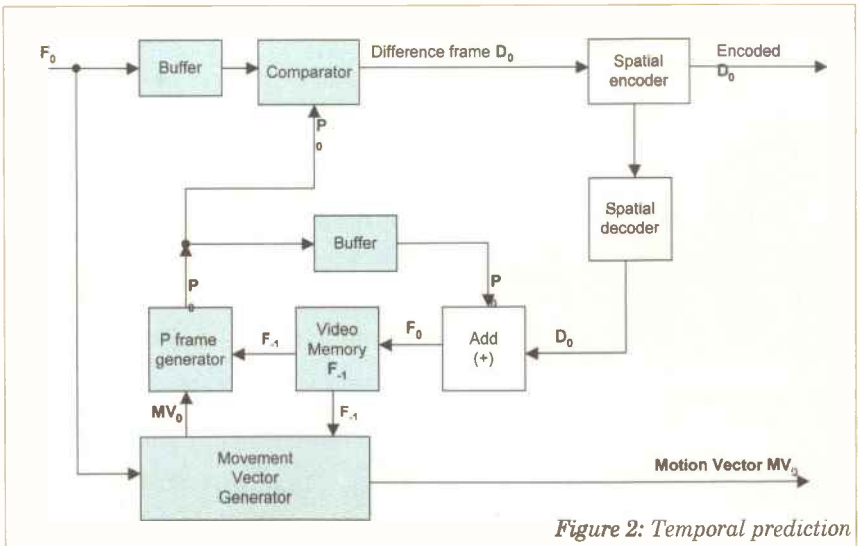


Figure 2: Temporal prediction

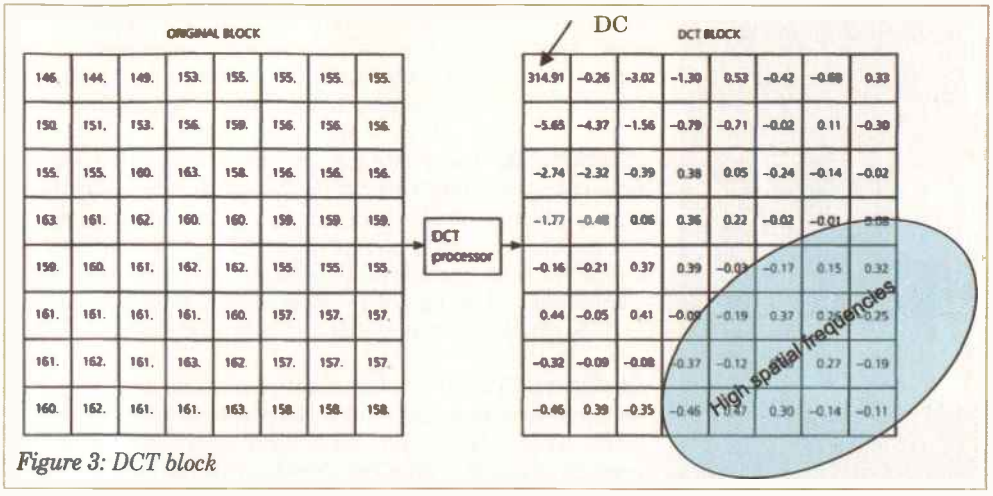


Figure 3: DCT block

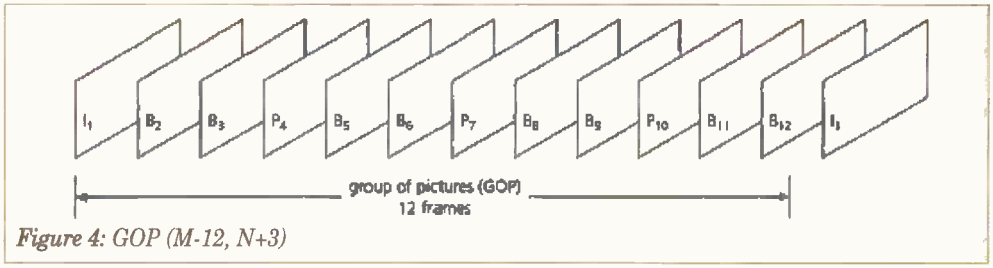


Figure 4: GOP (M-12, N+3)

fully defines the contents of the picture frame.

The P frame is constructed using a decoder, identical to the decoder used at the receiving end. The same I frame that was used to generate the motion compensation vector is used to construct the P frame. The P frame is subtracted from the current frame to generate a difference frame, which is also known as the residual error. This is multiplexed with the parameters of the motion compensation vector to form the video bitstream. The difference frame now consists of a series of spatial pixel sample values suitable for spatial compression. (fig. 2).

Spatial frequency compression

The heart of spatial redundancy removal is the Discrete Cosine Transform (DCT) processor. Before entering the DCT processor, the line-scanned pixels must be converted into blocks of 8 x 8. Sampled values of each block are then fed into the DCT processor, which translates them into an 8 x 8 matrix of DCT coefficients representing the spatial frequency content of the block. The coefficients are then scanned and quantised before transmission. The DTC is a kind of Fourier transform. A transform is a process which takes information in the time domain and expresses it in the frequency domain. fig. 3 shows an example.

The top left-hand cell of the DCT block represents the zero spatial frequency, equivalent to 0Hz or the DC component of temporal frequency. The coefficient in this cell thus represents the average brightness of the block. The coefficients in the other cells represent an increasing spatial frequency component of the block, horizontally, vertically and diagonally. The values of these coefficients are determined by the amount of picture detail within the block.

Discrete cosine transformation does not directly reduce the number of bits required to represent the 8 x 8 pixel block. Sixty-four pixel sample values are replaced by 64 DCT coefficient values. The reduction in the number of bits follows from the fact that, for typical blocks of natural images, the distribution of the DCT coefficients is non-uniform. An average DCT matrix has most of its coefficients and, therefore, the energy, concentrated at and around the top left-hand corner; the bottom right-hand quadrant has very few coefficients of any substantial value. Bit rate reduction may thus be achieved by not transmitting the zero or near-zero coefficients. Coding of DCT coefficients in MPEG-2 employs two coding techniques: run-length coding (RLC) and variable length coding (VLC). Run-length coding exploits the fact that among the non-zero DCT coefficients there are likely to be several successive occurrences of zero coefficients. Instead of transmitting these coefficients as zeros, the number of zero coefficients is encoded as part of the next non-zero coefficient.

Buffering

The DCT coefficient quantisation, run-length and variable length coding produce a varying bit rate. The actual bit rate depends upon the complexity and the amount of motion in the picture. A variable bit rate would occupy a varying amount of bandwidth and may exceed the total available bandwidth with detrimental effect on the picture. To avoid this, a constant bit-rate is obtained by dynamically changing the quantisation of the DCT matrix block.

The maximum bit rate is a function of the picture quality. For standard definition (SD) main level coding is used which specifies a maximum bit rate of usually 15Mbps or whatever the broadcaster wishes to place the upper limit at. For HDTV it is 60 MHz.

Bidiredional prediction

The bit rate of the output data stream is highly dependent on the accuracy of the motion vector. A P-frame that is predicted from an accurate motion vector will be so similar to the actual frame that the difference will be very small, resulting in a low bit-rate. However, a speculative motion vector will produce an inaccurate predictive frame, hence a large frame difference and high bit-rate. Bidirectional prediction is used to improve the accuracy of the motion vector. This technique relies on the future position of a moving macroblock as well as its previous position. Bidirectional prediction employs two motion estimators to measure the forward and backward motion vectors, using a past frame and a future frame as the respective anchors.

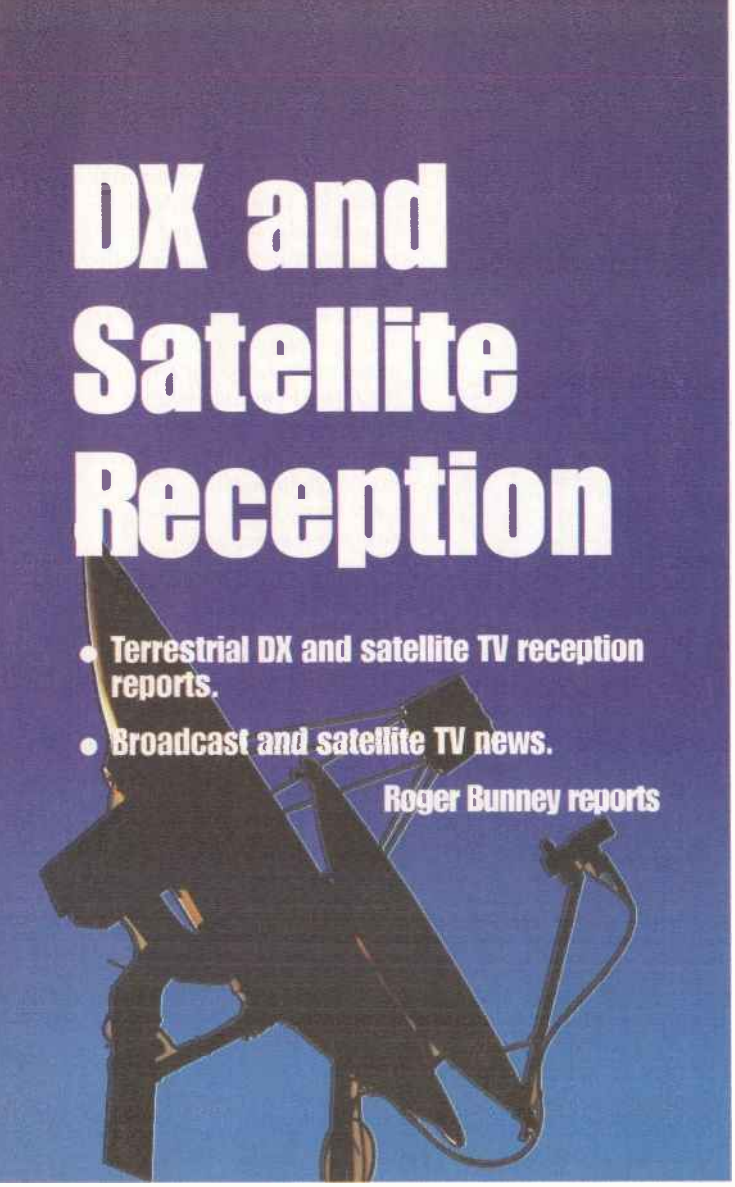
GOP construction

Incoming frames within a group of pictures may be coded in one of three ways: I, P and B. For a given picture quality, a coded I frame needs three times more bits than a coded P frame, which itself requires 50% more bits than a coded B frame. For this reason, in a typical GOP of 12 frames, there are one I frame, three P frames and eight B frames (fig. 4). The composition of the GOP is described with two parameters: the number of pictures in the group and the spacing between anchor frames (I or P frames). For example, fig. 5 shows a GOP with M = 12 (12 pictures in the group) and N = 3 (an anchor frame I or P occurs every third frame).

DX and Satellite Reception

- Terrestrial DX and satellite TV reception reports.
- Broadcast and satellite TV news.

Roger Bunney reports



July 2006 produced the most remarkable Band 1 Sporadic E conditions that I have seen in over 40 years of TV-DXing. Here in the south of the UK reception generally favoured a north-south path with TVE Spain, RTP Portugal and Italian TV (both RAI and the private TV stations) being received day after day. Alternating periods also occurred to the east-south-east into TVR Rumania, MTV/RTL Hungary, HRT Croatia and the more exotic signals from the Middle East. But what has been very unusual was the very long duration signals, literally for hours and often just above noise level. In one reception period low level Sporadic E was present for over 24 hours! Extreme DX reception has just been reported from the UK and Portugal into North and South America, with one report saying that TVE/RTP has been received in Illinois, US.

International news

The ITU Regional Radio Communication Conference involving the Middle East, Africa and Europe passed new broadcast allocations for the new terrestrial world once analogue has been terminated. Only Bands 3, 4 and 5 will be used for DVB-T across 114 countries including digital TV mobile and HDTV. Band 1 will therefore end its use for European TV transmission after nearly 70 years, putting analogue on course to have closed by 2015.

Broadcast and trade bodies within the satellite industry are asking Asian governments to ease restrictions on satellite reception and allow viewers a transparency of international transmission reception. Several countries such as India, China and certain Arabic countries restrict viewer's access to specific programme sources from satellite which may deter satellite operators from targeting many areas of Asia. The fear is that the situation will slow receiver equipment manufacturing and encourage broadcasters and satellite owners to direct their output to more attractive markets.

Australia: Broadcasting across the country will change from next year as the government has announced relaxation in media ownership, that will allow an increase in foreign owned broadcast and print operations. This will challenge the strong position currently held by Rupert Murdoch's 'News Corporation'. More digital TV channels are to be encouraged and the closedown of analogue has been extended until 2012

Holland: The BDXC have confirmed that the closure of all analogue transmitter networks of the national TV networks NED-1, NED-2 and NED-3 will take place on the evening of October 29, 2006. The closure had been postponed from earlier this year.

Switzerland: Zurich now has full DTT channel coverage as the country gradually moves into digital. The digital change over has initially taken place in the French and Italian speaking areas with DTT now available across the regions. Completion of DTT coverage is expected late 2007. The Tessin (Italian region) has closed down analogue TV with a complete country analogue closedown being scheduled for 2009.

Estonia: Digital TV will launch in December 2006 with two multiplexes, a third next year and a fourth in early 2009. The government is aiming for at least 15 TV channels and MPEG-4 will be used from the start. Tallinn has successfully hosted MPEG-2 test transmissions from 2003 and analogue close down will start 2010 through to 2012.

Italy: The government is concerned over the delays in progressing the opening of DTT in the country and is likely to announce a timetable for DTT introduction and analogue closure later this year. DTT tests in Val D'Aosta and Sardinia – ending July 2006 – will provide further data to the government on creating their timetable for the Italian move into the digital era.

Eire: Irish national broadcaster RTE is seeking a DAB transmission licence to open digital radio along the Louth-Dublin coastal area during the autumn of 2006 offering at least 6 radio channels. RTE is hoping to advance DAB radio with the involvement of both state and commercial broadcasters. With DABv1 less popular now that the more versatile DABv2 is available and the favoured DRM+ increasingly popular in Europe, decisions on a future digital radio standard are important to adopt both a versatile and flexible radio standard.

South Africa: DTT will open up early 2008 in the populated areas with significant investment into upgrading the broadcasting network aiming for nationwide coverage within 2 years, supporting at least 12 HDTV channels.

Taiwan: The government has given the OK to its public TV channel to upgrade its studio and transmission network for the move into DTT anticipated by autumn 2007. This will allow the transmission of the Olympics in 2008 from Beijing.

Brazil: The government has signed on the dotted line for digital TV to go ahead and has opted for the Japanese system, possibly encouraged by the Japanese offering both technical and trade support – no dates are as yet available for a digital start up.

World events

A period that predictably (I thought) would contain a mid-summer of the World Cup finals, Wimbledon and perhaps sightings from Iraq. Instead this period produced perhaps the most violent period of change in the Middle East for years.

Satellite news links increased around August 28 in response to the kidnapping of Israeli soldiers by Hezbollah. The Israeli army entered Gaza with heavy armour whilst the air force took out several strategic targets including the power station.

Live pictures of tanks moving into Palestine were transmitted for several hours courtesy of the Israeli satellite facility 'BEZEQ SAT' – 11.095GHz-Vertical – Symbol Rate 4226 + Forward Error Correction 7/8 over Atlantic Bird-1 (AB-1) @ 12° West.

Meanwhile over Eutelsat W1, 10° East, dramatic pictures of the conflict appeared showing the power station burning -10.967GHz-V (4167+5/6).

The same evening two carriers were running for CBS New York over on Eutelsat W2, 16° East, with reports on the continuing violence – 'CBS NX Baghdad' – 12.542GHz-Horizontal and at 12.557GHz-H (both 5632+$^3/_4$).

Continued escalation

Fast forward a couple of weeks and as the conflict escalated all the major networks were establishing temporary reporting sites. Sky News set-up on a hillside overlooking Haifa, from where live reports were fed into their news output with clever linking enabling one reporter in Haifa to interview his counterpart in Beirut. Sky generally used 'NEWSLINK' over W2, 12.525GHz-H (with an unusual SR2816+5/6). 'SAVANA-7' was another uplink site on high ground – John Snow (Israel) reporting live back into the UK on July 15, paused, held his hand upwards and noted that two Israeli bombers had passed overhead and that they would be arriving with his Beirut colleague in a minute or two! 'SAVANA-7' initially began operations over W1 @ 10.981GHz-V (5632+ and unusual 5/6 usually it's $^3/_4$) but moved its W1 slot to 12.737GHz-V (4167+5/6), near to 'APTN BEIRUT' – 12.743GHz-V (the usual APTN 4167+5/6).

July 18 provided live pictures of US Marines in a large chopper landing inside Beirut and the US Consul on site wishing all the rescued US citizens a safe trip as they departed the violent town – via 'ISOL-184' on W1, 11.083GHz-V (5632+$^3/_4$).

Later that same day dockside pictures on the same W1 slot as HMS Gloucester arrived to rescue UK citizens. July 22 and a clutch of W1 activity from 'FOX_EDGE_KIRY'; 'KYRAT_SMIMON' and '4 SERVICE' with reports into the American networks, one battle hardened reporter a very familiar face from Baghdad. The BBC have been utilising Atlantic Bird-1, 12° West for much of their live reporting – 'BBC NeWS HAIFA' – 11.095GHz-V [signing as 'LOCAL CONTENT'] and with additional capacity from 'BEZEQSAT' – 11.084GHz-V (both 4226+7/8). The past weeks have been packed with Middle East activity – but life continues ever onward.

A lighter note

STS-121, the Shuttle Discovery launch was planned for July 1 but weather problems delayed the flight until US Independence Day. NASA TV provided full and detailed coverage on W1, 10.962GHz-6V.

Dramatic images as the craft took into the air with on-board cameras – actually on the rocket's side – showing the launch pad and then Florida slipping away – a successful trip and the Shuttle returned to Earth safely.

The Gaza power station after an Israeli air attack (W1)

Night-time Israeli armour movement into Gaza (W1)

The American fly out their citizens from war torn Beirut (W1)

Palestine TV is still on the air (W2)

The Hezbollah backed 'Al Manar' TV is also still on air (July 26 on W1)

Dramatic view of the Kremlin (W1)

Tivoli Audio CELEBRATES!

Tivoli Audio celebrates 100 years of radio with tribute to 'world's first wireless broadcast' in 1906

Respected radio manufacturer Tivoli Audio says one hundred years ago this year the world received its first broadcast of voice and music, giving birth to the age of wireless radio as a form of entertainment and news. To mark the occasion Tivoli Audio has paid tribute to a relatively unknown inventor by the name of Reginald Aubrey Fessenden, describing him as the 'Father of Broadcasting'. Tivoli says Fessenden bought the concept to life with the world's first transmission of voice and music on December 24, 1906.

Tom DeVesto, founder, chairman and CEO of Tivoli Audio says: "Without this significant accomplishment, achieved in 1906 by a relatively unknown inventor (Fessenden) radio and television as we know it today would never exist as a means of news and entertainment to be enjoyed and listened to by the masses."

DeVesto adds: "Unlike Marconi who used a series of sparks to create dots and dashes to communicate one to one, Fessenden had the vision to understand that his continuous wave technology could communicate by sending signals in speech and music to multiple recipients. Fessenden foresaw radio the way no one did at that time and gave birth to the broadcast entertainment industry."

Legend has it that Thomas Edison told Reginald Aubrey Fessenden that he had as much chance of transmitting speech as 'jumping over the moon'.

You say you want a revolution?

Tivoli says the wireless radio broadcast revolution began on December 24, 1906 at 9 PM East Coast time, with the historic event of Reginald Fessenden's first wireless public radio broadcast of voices and music. Fessenden transmitted live from Brant Rock, Massachusetts, to wireless operators of several US Navy, United Fruit Company and fishing ships in the Atlantic Ocean. What they heard, for the first time, was Fessenden broadcasting his rendition of 'Oh Holy Night' on the violin, a recording of Handel's 'Largo' played on the Ediphone and readings from the Bible, before wishing everyone a Merry Christmas. He repeated his gift of broadcast radio again on December 31, 1906. This time it took the form of a New Year's Eve performance – presenting wireless radio transmission as a form of entertainment – again not just the dots and dashes sent as Morse code messages from point to point that marked the radio reception of that time, but to a multitude of recipients simultaneously. His first broadcast was successfully received by dozens of ships in the Atlantic Ocean as seamen reported back to him on the broadcast transmission, confirming the invention of radio.

The real beginning

Robert Merriam, president, New England Museum of Wireless and Steam, Inc says: "Technically, electronic entertainment or 'real' radio began with Reginald Fessenden in 1906. Prior to Fessenden's technology, the world communicated by wireless with Marconi's Morse code broadcasting of dots and dashes tapped out by the telegraph key.

"The continuous wave technology discovered by Fessenden allowed him to perfect the transmission of speech and music, giving birth to the concept of broadcasting as a form of entertainment and news."

Legend has it that Fessenden would often be found in a river or lake, floating on his back, a cigar sticking out of his mouth and a hat pulled down over his eyes pondering his next invention. And it was supposedly on one of these occasions that that Fessenden first realised the effects of continuous waves on radio transmission.

It is said Fessenden first discovered the continuous wave technology by throwing a stone in a lake and observing how the waves circled outward where the rock hit the water. He believed that for voice sounds to travel wirelessly, the Hertzian waves must radiate by encircling

Tivoli likes to combine quality cabinets with the latest technology in radios like the Model DAB Stereo

an antenna at the receiving station. Marconi's transmission operated in sparks that would stop and go, but Fessenden saw the need for continuous steady streams.

Championed by some as the unsung hero, Tivoli says Fessenden is technically the inventor of radio telephony or what radio listeners would call 'real' radio. The company believes he should have received worldwide acclaim as the inventor of radio. Instead he never received his due recognition, even loosing control of his patents and the revenue, which would have amassed him immense wealth. The Encyclopedia Canadiana only mentions his achievements under a listing for his mother Clementina, who established Empire Day in Canada. Reginald Fessenden is credited as one of her four sons who was the: 'inventor of the wireless telephone, the radio compass and the visible bullet for machine guns, he also invented the first television set in North America in 1919.' American books describe him as the American "Marconi". At the time of his death at age 62, Fessenden, largely a forgotten man, was called by the head of General Electric Laboratories: "The greatest wireless inventor of the age – greater than Marconi."

Fessie to his friends

Reginald Fessenden was born in Canada in 1866. He worked for Thomas Edison and George Westinghouse on some of their most famous achievements. He was Professor of Electrical Engineering at Purdue University and chief of electrical engineering at Western University of Pennsylvania (today University of Pittsburgh). He holds over 500 patents for his inventions, which is second only to Thomas Edison. He was hired by the U.S. Weather Bureau to develop wireless transmitters to forecast the weather. He developed a wireless system for submarines to signal each other, as well as a device using radio waves designed to locate icebergs miles away, thus avoiding another disaster like the one that destroyed the Titanic. At the start of World War I, Fessenden was sent to London where he developed a device to detect enemy artillery and another to locate enemy submarines. Although an admirer of Marconi, Fessenden always felt that the Marconi spark-coherer system was fatally flawed in that it would never be able to send Morse signals at any great speed and that it held no prospect of sending or receiving speech. Edison who called him "Fessie" had told him that he had as much chance of transmitting speech as 'jumping over the moon'.

Donna L. Halper, media historian, Emerson College also believes the man deserves more credit, she says: "Reginald Fessenden is truly the father of broadcasting and created what became the broadcasting industry.

"He was literally on the cutting edge as he sparked the romance of wireless, transforming it from bursts of electrical dots and dashes to a continuous wave transmission of speech and music. Although the average person at the time didn't have a clue that this technology was going to affect society for the next 100 years, we owe Reginald Fessenden a huge debt of thanks for his vision and perseverance."

Tivoli Audio

Tivoli Audio itself was founded in 2000 with the avowed goal of bringing beautifully designed, simple-to-use, high-quality audio products to the consumer at reasonable prices. Started by Tom DeVesto, a long-established designer and leader in the audio industry, the new company marked the last chapter in DeVesto's 30-year professional relationship with the late, legendary audio innovator and Audio Hall of Fame inductee, Henry Kloss. Tivoli Audio believes it is no slouch itself in the inventing stakes, brining to market what it describes as some of the most innovative audio products in the world. These include the world's first Model Satellite Sirius table radio for home use, Model One AM/FM Table Radio, Portable Audio Laboratory (PAL), RadioCombo complete stereo system, and iSongBook complete music system with universal docking system for all Apple iPod models.

Tivoli is proud of its own record in invention and design with products like the songbook 100

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distributor of electronic compone

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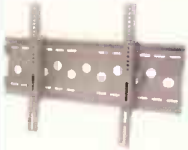

Universal tiltable (+15% / -15%) wall su for large plasma and L

Tiltable : +15° / -15

Display size : 30"-63

Max. display weight : 7

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Twist arm with two articulations to apply to the above Plasma Bracket.

Two turningpoints 180° and 40°

Distance from wall min. 6 cm, max. 30 cm

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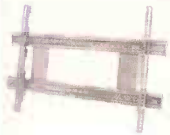
Universal Wall Mount Plasma Bracket



This plasma bracket can be used with most plasma and LCDs, due to its universal mounting possibilities.

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Max. display weight : 80kg

Carriage Charged at £ 6.00 + vat

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Simple but very robust w bracket for mounting Plasm big LCD televisions to the w one fixed position.

Display Size : 30"-50"

Max. weight : 60 kg

VESA standard : 50/75/1

Distance between TV screen and wall: 2,5 c

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Order Code : LCDBKT8S
Price : £ 6.00 + vat

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Length	Code	Price
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Price : £ 2.00 + vat

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MC 44608P75	£ 2.50 + vat	TDA 7293V	£ 5.50+ vat
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Television without Frontiers

The Department for Culture, Media and Sport (DCMS) has launched a consultation on European Commission proposals to revise the European Union's Television Without Frontiers (TVWF) Directive.

The three-month consultation will aim to gauge the views of UK industry, consumers and other interested groups, to inform discussions in the European Council and the European Parliament.

In particular the Government is keen to gather stakeholders' thoughts on the proposal that TVWF should be extended in scope to become an 'Audio-visual Media Services Directive.'

TVWF would then cover all media services whose principal purpose is to provide moving images to the general public over electronic networks for purposes of information, entertainment, or education.

It would apply to services delivered over the Internet, mobile networks, telecoms networks, and terrestrial, cable and satellite broadcasting networks. Currently the Directive only covers television broadcasts.

Broadcasting Minister Shaun Woodward (pictured) said: "The Government has concerns about the Commission's proposals. We've been clear about that.

"We have already had extensive discussions with industry and other stakeholders. But we need to know more about what they think, especially the likely impact on new media services.

"The proposed changes could have a major impact on the development of services that people access over the Internet and on their mobile phones. The economic and cultural impact of the proposals will be substantial, and they could also extend red tape where we should be cutting it.

"This consultation will enable us to take the considered views of industry and the public back to the Commission and to our fellow Member States, so that the final Directive takes account of what is best for the UK and Europe in the future."

Free flow

Created in 1989 and revised in 1997, the Directive's main purpose is to ensure the free flow of television programmes and broadcasting services throughout the European Union.

It does this by ensuring the free reception of broadcast services authorised in Member States, which must keep to minimum content standards and to rules on advertising, teleshopping and sponsorship.

In December 2005 the Commission published proposals to update the Directive, in the light of major changes to the media since it was revised in 1997.

The proposed updates fall into six categories:

1. Scope of future regulation – whether the Directive should also cover services such as the internet and mobile phones.
2. Jurisdiction – the rules which determine which Member State has responsibility for any particular TV broadcaster.
3. Rights to information and short extracts - whether broadcasters should have access to short clips of events such as sporting matches for news reports.
4. Promotion of European works - how best to promote production of and access to European work in broadcasting and electronic media.
5. Commercial communications – changes to advertising rules; whether product placement should be allowed, and if so, how it should be regulated.
6. Protection of minors and incitement to hatred – extending controls to protect children and prevent incitement to hatred.

In July 2005 the European Commission published six 'issue papers', covering its proposed areas of focus and initial proposals for revision.

On 14 November 2005, Secretary of State for Culture, Media and Sport, Tessa Jowell,

chaired a discussion among the Audiovisual and Culture Council of Ministers in Brussels, regarding plans for the switchover to digital television.

The aim of the discussion was to share experiences and exchange good practice. All Member States agreed that it was a big challenge, but one that is achievable. Many stressed the added value of digital television especially for minority groups and strengthening cultural diversity.

As part of the UK Presidency, the DCMS and the European Commission hosted a major European conference on the Directive, which took place in Liverpool, 20-22 September 2005.

The TVWF Directive is the main EU legislative instrument on broadcasting, and sets minimum standards on areas such as advertising and the protection of minors.

It is a Single Market Directive, enabling the free movement of television services across frontiers within the EU. The Directive was originally negotiated in 1989 and was revised once before in 1997.

Key policy issues

The UK is playing an active role in the discussions on the revision of the Directive.

Many of the key issues involved in the revision of the Directive are concerned with responding to the challenges of technological change. Key questions include:

- Should the scope of the revised Directive be extended to web casting and radio?
- Should there be more flexibility in the advertising restrictions? (For example, to allow "product placement", or to compensate for the new technical ways of avoiding ads such as Personal Video Recorders)
- How we can ensure that audiences can continue to benefit from minimum content standards in a multi-channel, multimedia environment? (For example, by promoting media literacy and common labeling systems)

Another important issue in the revision of the Directive is the 'country of origin' principle, which determines which Member State has jurisdiction.

The Commission propose that TVWF should be changed into a Directive in respect of audiovisual media services generally – an 'Audiovisual Media Services Directive' (AVMS).

These proposals are now under discussion in Europe, both within the Council of Ministers and within the European Parliament. We expect that these discussions will continue into 2007.

Extended scope

The Commission proposes that the overall scope of the new AVMS Directive should be any service as defined by Articles 49 and 50 of the Treaty the principal purpose of which is the provision of moving images with or without sound, in order to inform, entertain or educate, to the general public by electronic communications networks. It calls these 'audiovisual media services'.

By contrast, the TVWF Directive applies only to television broadcasting, which is defined as the initial transmission by wire or over the air, including that by satellite, in encoded or unencoded form, of television programmes intended for reception by the public.

This includes the communication of programmes between undertakings with a view to their being relayed to the public. It does not include communication services providing items of information or other messages on individual demand such as telecopying, electronic data banks and other similar services.

As explained more fully in the partial Regulatory Impact Assessment, the Commission propose that the audiovisual media services defined by the new Article 1a would be divided into two categories, linear and non-linear.

'Linear' services would be analogous to television, with scheduled content. 'Non-linear' services would those which were 'on demand', where it is the user, not the supplier, who decides when particular pieces of content are transmitted.

Member States would be required to ensure that audiovisual media services within their jurisdiction complied with the Directive provisions, though they could impose higher requirements on them if they wished.

Linear services would be subject to similar requirements to those that are imposed by TVWF, but with some simplifications and differences, particularly with respect to advertising.

Non-linear services would be subject to fewer requirements at EU level, designed to provide protections for minors and against incitement to hatred, promote European work and meet requirements in terms of advertising, sponsorship and product placement. Section 2 of the partial regulatory impact assessment sets this out in more detail.

The Commission's stated intention is to provide for non-linear services the Single Market advantages which television broadcasting services currently enjoy under the TVWF Directive. Most, but not necessarily all, of these non-linear services are currently covered by the e-Commerce Directive.

As compared with that, the proposed new AVMS Directive would provide far fewer and narrower grounds for Member States to derogate and decline to accept particular audio-visual media services from elsewhere in the EU.

However, the introduction in Article 3c to 3h of the revised Directive of basic requirements for all these services, both linear and non-linear, could arguably provide a balancing measure of protection.

The Commission's proposals would also mean important changes to minimum standards that the EU sets on television broadcasting and other linear services which are established in Member States.

These affect advertising in particular – the EU controls would be much simplified, and there would be clear provision allowing Member States to permit their broadcasters to include 'product placement' within programmes.

Timing and process

Subject to agreement, the revised Directive would need to be implemented in EU Member States by 2010. It will be subject to Qualified Majority Voting within the Council of Ministers. Its final text will be subject to the co-decision procedure, involving agreement between the Council of Ministers, the European Parliament, and the European Commission.

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S W Amos; R S Amos

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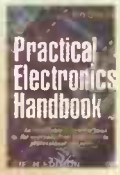

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3rd edition ▲ Aug 2003 ▲ 624 pages ▲ Index
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Published in UK
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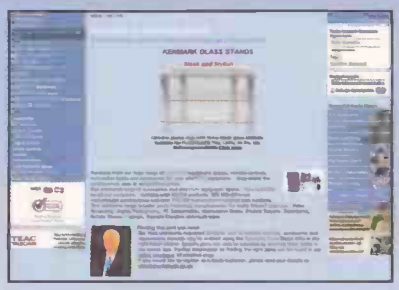

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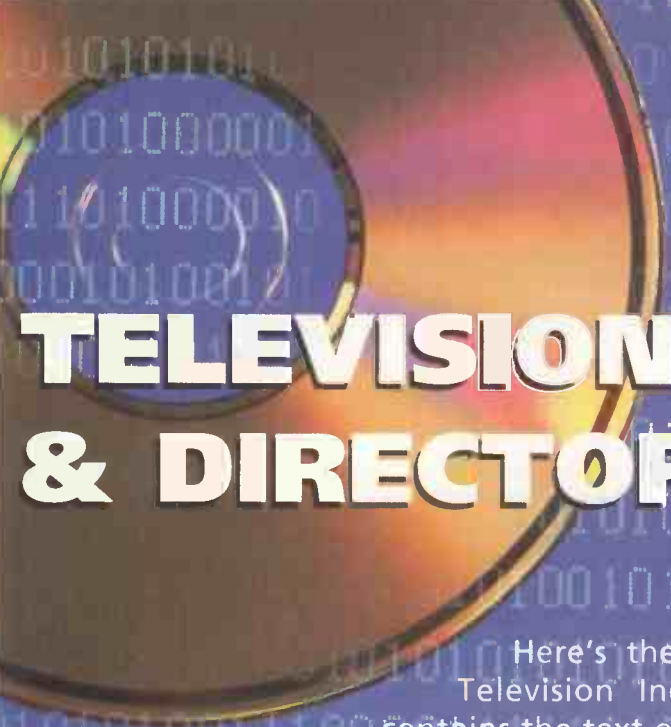

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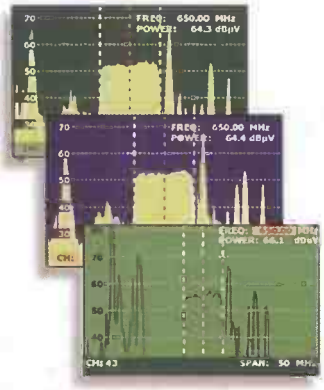

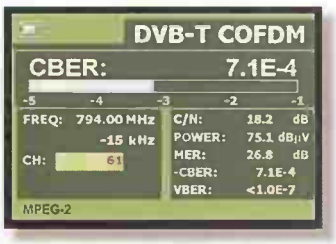

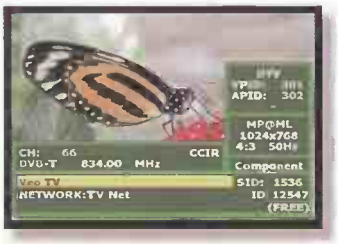

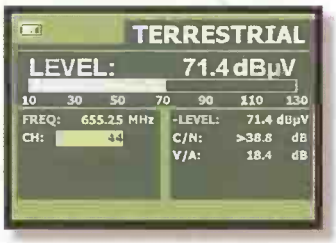

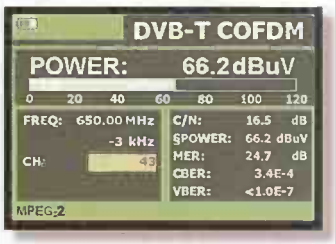

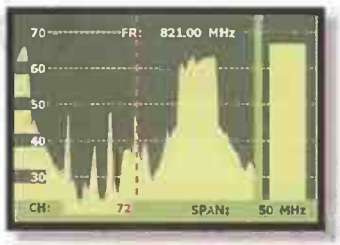

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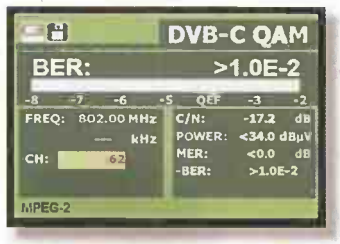

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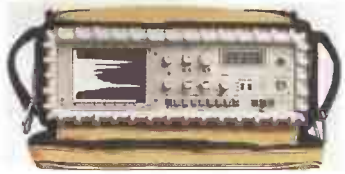

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