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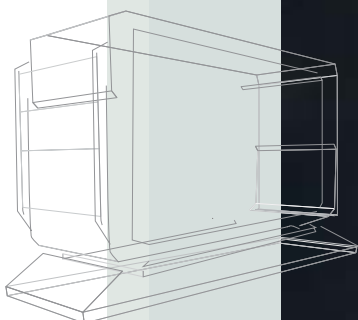
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This issue's highlights

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GEM'S
POPULARITY

A word from the DVB Project Office

Welcome to another issue of DVB-SCENE. Our aim is to bring the most up-to-date news on DVB to the key broadcasting professionals, both within and outside the project. DVB is news everywhere - DVB-SCENE helps you join the dots and fill in the background.

GEM is still in the news. Globally Executable MHP is the glue which seeks to bring together the different Java-based open API systems. Part of the MHP suite of standards, GEM's aim is to provide a guaranteed set of APIs and protocols which application writers can use to develop their applications so that they run anywhere - yes, anywhere. GEM is the

fruit of much work involving experts from DVB and CableLabs, and proved so popular that we have received requests from Japanese and other U.S. digital broadcasting standardisation bodies anxious to ensure that their open API systems embrace MHP and GEM. The technical details of such cooperation are sometimes not the most difficult hurdles to overcome. DVB is a body providing standards for the broadcasting world, and thus must ensure that issues such as IPR and technical development roadmaps are clearly laid out prior to finalising the specifications cementing the co-operation.

April saw NAB '03 in Las Vegas. One of the key trade shows of the year, NAB was yet another indication of the difficult economic times in which we find ourselves. Surprising perhaps, and despite the lower attendance, there were more new product launches than in previous years. Closer to home, it was interesting to note the different approaches being taken on both sides of the Atlantic to digital terrestrial television. The US terrestrial market is still very focused on digital HDTV, while their European counterparts are concentrating on value-added services such as Interactive Television.
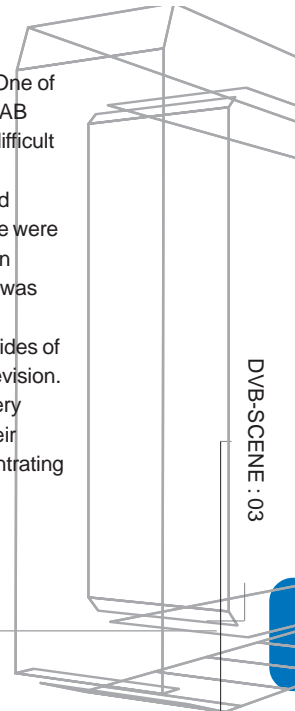
A DVB
WORLD

Left: Dr Ulrich Reimers, Chairman of DVB Technical Module and DVB Chairman Theo Peek.

The success of DVB World 2003 further establishes the conference as a 'must attend' for all those involved with developing and implementing DVB services. Highlights for this year's audienceof some two hundred delegates in Dublin included an address by Dr Ulrich Reimers, who brought conference participants up-to-date with the works of the Technical module. DVB Chairman Theo Peek reviewed the achievements of DVB over the last ten years and Sun's Bill Foote was on hand to introduce DVB's latest specification, GEM, which allows for a write-once, run-anywhere capability for MHP applications. The keynote speaker, Don Dulchinos, CableLabs VP of Advanced Platforms and Services, highlighted CableLabs and the ATSC's recent collaborative efforts on the harmonisation of standards to enable the execution of MHP applications and services in the U.S..

Information on how to obtain conference proceedings can be found on the DVB website - www.dvb.org. Provisional dates for DVB World 2004 in Dublin have been announced for 3 - 5 March. For further information, please contact seminar@iab.ch.

A FREE VIEW

Martin L. Bell, Director of Communications for the UK's Digital TV Group

The runaway success of free-to-view digital terrestrial television (DTT) in the UK has taken everybody by surprise. There are predictions of over two million sales this year, and that DTT take-up will match that of satellite within a few years. But less certain are longer-term predictions of digital take-up and hence the date when analogue switchover can happen.

For many UK homes Freeview - the brand name of the non-subscription DTT package of 30-odd channels - has had the appeal that subscription-based digital TV did not. And with the demise of the 'free box if you subscribe' offer, a real open market in receivers has developed, bringing wide market choice as a range of receivers with varying features - twin tuners, DVD record decks and hard disc storage - appears in the shops.

Key to this success is the strong programme line-up provided by the public service broadcasters, who, besides simulcasting their five analogue services in widescreen, provide additional digital channels - particularly the BBC, now with a total of eight.

Earlier technical shortcomings have now been rectified: transmitter power at many sites has been doubled; the calculations which predict where reception is possible now use more realistic assessments of aerial performance; retailers now always check that a customer is within coverage before selling a receiver. Coverage is better - at 75 percent. Returns of receivers to shops have dropped sharply to realistic levels. Also, the advertising is hitting the mark.

While optimism prevails, the certainties of reaching analogue switchover within the UK Government's desired timetable are less certain. A recent report from the BBC and ITC concludes, "it is unlikely that the Government's current criteria will be met to enable a nationwide switchover in the early part of the 2006-2010 target window", going on to admit that, "We do not feel confident, when DTT has only recently been re-launched as a wholly free-to-air platform, about making detailed projections for take-up in the latter part of the Government's target window and beyond."

Nevertheless, one influential industry voice, Barry Cox, has predicted that the UK will be fully digital by 2014. Cox is the chairman of the industry stakeholders group within the joint government/industry Digital Action Plan. This wide-ranging initiative - with the Digital TV Group's active involvement - is working on many issues, including how to extend coverage and uptake as the countdown to analogue switchover continues; on ensuring good quality aerial installations; on how to convert video recorders and how to provide schedule data for open standard PVRs; on how to solve the connectivity maze of a typical digital household; and, crucially, on how to ensure conformance and interoperability in the open market both in the increasingly diverse range of receivers coming to the market and in interactive broadcast applications.

While national routes to analogue switchover can (and should) differ, one lesson that we have learnt in the UK is clear: success comes only with willing and energetic co-operation between all the players in the market - broadcasters, network operators, manufacturers and retailers, working together with the active support and encouragement of regulatory bodies and government.

Pictured above: Former international footballer and BBC sports commentator Gary Linneker and actress Jerry Hall in the promo for the BBC's digital services available on Freeview.

DOUBLE YOUR PLEASURE, DOUBLE YOUR FUN

The Pace Twin Digital TV Recorder is an integrated digital terrestrial receiver and hard disk recorder that the company claims is easy to use and gives access to digital TV with all the functionality of a VCR. The product is the first integrated digitial TV recorder in the UK market with a one-off cost and no contract that is helping to drive the success of digital take-up.

LIFE JUST GETS EASIER

The new MediaHighway Advanced middleware platform from Canal+ that powers Canal Satellite's Pilotime, is for a new generation set-top box designed to boost operators' revenues and to enable a wider range of iTV services. The technology combines an MHP stack with

an HTML engine and a PVR module to access TV services and entertainment.

The MediaHighway Advanced enables the use of smart EPG, PPV, 'personal TV' services such as personal video recorder and time shifting, email connections and many interactive services.

Designed to run on hard disk drive equipped set-top boxes, the iTV platform allows seamless navigation from one environment to another and the use of the hard disk drive for many services so that applications data is cached on the disk, walled garden websites are pushed onto the set-top box without a telephone connection.

Viewers can easily record and store programming on the hard-disk drive. The dual tuner enables viewers to record a programme while watching another channel or while using an interactive application. Up to 40 hours of programming can be stored, and a programme can be watched from the start even if it is still in the middle of being recorded.

By continually and automatically recording the live feed, viewers can watch TV when they want. Viewers can pause live TV and watch it later, watch a programme in slow motion, or fast forward or rewind a show.

To choose a programme to watch or record from the EPG, viewers have access to a keyword and a multiple filter search engine. By combining EPG and recording functions, a viewer can record all episodes of a TV series over the course of several weeks.

Developing applications for MediaHighway Advanced has been made easy thanks to the specific structure of the applications which include a 'develop once, use many' feature.

The MHP compliance also ensures that many software houses can produce interactive applications for the platform.

MHP compliance allows the MediaHighway MHP middleware to integrate a wide range of digital set-top boxes, while providing the interactive platform for the creation and development of compelling MHP applications.

The MediaHighway Advanced platform has been designed to let the operator host a number of outside interactive content providers to generate additional revenues per subscriber. This openness is enabled by the use of the widespread programming languages Java and HTML and by the software architecture of the platform, which has been conceived from the start to create new revenue streams from the rental of the hard disk space.

The MediaHighway Advanced platform includes content-push functions to deliver video, music or data content and offer on-demand services. New revenue streams can be produced by programme downloads, video-on-demand and content rich games.

Over 20,000 subscribers have already chosen this new set-top box.

IT HAPPENED
ONE NIGHT

Dr. Wilfried Geuen, Managing Director Pansonic European Laboratories

It has happened. The switch over from analogue to digital in the Berlin-Brandenburg region was a success. On 28 February, more than twenty digital television channels came on air. The change took place in the early hours and was a success from an organisational and technical viewpoint.

The exciting question was, would the change from analogue to DVB-T transmission be possible in one night and how would the TV viewer react? The answer to the first question is quite clear. At 2am the countdown started when the analogue transmitters where shut down. By 6am the first DVB-T transmitted channels were on air and by 8am all the other TV channels had followed suit. This running change was a real challenge, because in Berlin a SFN (single frequency network) system was introduced and to achieve this the numerous transmitters had to be synchronised during this short night session. Most of the work for the switchover was prepared well in advance allowing the whole operation to be a great success.

The press had done a wonderful job in informing the nearly two million households of the imminent change to digital, so most knew exactly what to expect. Hotline services had been set up to deal with any query the public might have during the switchover. Except for a few glitches, most viewers were able to tune in to the new digital channels and overall greeted the new service warmly. For those viewers who can no longer receive analogue channels they have three choices: first to buy a DVB-T receiver (the cheapest DVB-T STB's are in the range of EUR159 to EUR199), second to install a satellite dish if possible or third to move to a cable operator (in Berlin there is approximately 90 percent cable TV penetration).

There were, however, some problems in homes that had cable TV services. In Berlin, there are a lot of small and medium size cable TV networks. The head-end station receives public and private TV channels mainly via an analogue TV receiver. Some of the head-ends were equipped with simple consumer DVB-T receivers and in some cases the video and audio were not synchronised properly. There were also cases where artefacts were observed.

Will Berlin be an island in Germany regarding the launch of DVB-T? Of course not. Berlin is the test case for the world's first DVB-T launch strategy with a clear shut off scenario for analogue terrestrial TV transmission. The first indicators from the launch look positive and therefore the Berlin approach will be introduced in several other regions. Almost all the necessary agreements are in place in two other regions. The first is the Cologne-Bonn- Düsseldorf region with approximately seven million potential DVB-T viewers where digital transmissions are planned for April 2004. This is to be followed by the northern region of Hannover - Hamburg - Braunschweig in mid 2004 with nearly five and a half million potential DVB-T viewers. Three to four other regions are planning to join by the end of 2004 and the beginning of 2005. This means that in just two years the major regions of Germany will be switched to DVB-T - again a world's first.
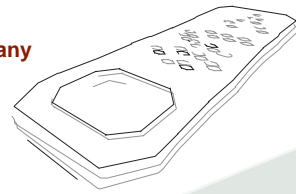
A regular contributor to DVB-SCENE, Dr. Geuen, is an elected member of the DVB Steering Board and chairs the national German TV Platform, the market launching group of DVB-T in Germany.

LOOKING GOOD

Dr. Helmut Stein assesses MHP in Germany

Interoperability Meeting at IRT

Let's start with the good news first! In September 2001, the German broadcasters, together with the media regulators of the German departments (Länder) signed the Mainz Declaration, where all signatories committed themselves to use MHP as the common technological platform for the introduction of interactive services in broadcasting. These broadcasters included the public broadcasters ARD and ZDF as well as the private RTL and Kirch Group (at the time) including Premiere the pay TV operator. Later on, the declaration was joined by all the major manufacturers so that a unique alliance to introduce MHP was formed. The common goal was to introduce interactive services and appropriate receivers in the German market on 1 July 2002.

What happened then? First of all, finalising the MHP standard in DVB took longer than expected. This was due to the immense complexity of the development of test suites which of course could only follow the progress of the specification itself. As a result, MHP version 1.0.2, including test suites and rules for the use of the logo could only be approved by the DVB Steering Board in November 2002. This affected mainly the rollout of receivers, as their software and approval process could not be done earlier. Services were already on air over satellite, so that testing was efficiently supported.

Given all these obstacles for an early rollout, what were the countermeasures of the MHP signatories? First of all, the development of new and interactive services had continued all the time and progress was shown at major fairs and exhibitions. Here ARD, Premiere, RTL and ZDF have been in the driver's seat and an impressive spectrum of MHP applications exist today and can be downloaded from a dedicated MHP test transponder on Astra satellite. To support

the receiver development, a very important decision had been taken by the industry partners as a spin off from Ulrich Reimers's MHP Implementers Group. According to the logic that you will find any open points or unclear definitions of a specification best when trying to use it, a series of interoperability tests was organised, where manufacturers could bring prototypes and test them with all existing applications. This open forum is a unique approach to gain speed and is very successful in its outcome. The host for these tests has been the IRT in Munich, a common research institute of the public broadcasters. Another important result of these activities was the interaction between application and receiver development as the overall performance of MHP applications needs a good hardware/software match.

Furthermore, a general marketing campaign and market introduction was successfully initiated by the German TV-Platform, a group of companies and institutions active in the field of television broadcasting in Germany. The MHP promotion group's efforts were accompanied by press activity, flyers, seminars, demonstrations, website, etc., so that a positive attitude towards MHP could be achieved. An important outcome of these marketing activities was the F.U.N. group, which had a limited amount of Open TV based interactive receivers in the German market, announcing a move to MHP and the cessation of existing services this year.

What is the status and outlook for MHP in Germany? First of all, receivers are available in the shops and services are on air. The interoperability of the different receivers and services has been reached and the services have been adapted to the performance of the receivers. Also, manufacturers can write more efficient software with their growing experience of Java based applications. As a further result of the introductory work, over a thousand modifications have been added to MHP 1.0.2, so that the last DVB Steering Board could approve version 1.0.3 as the latest and most mature specification. Also, the price of receivers will decrease sharply this year once the market has begun, as even the cheapest microcomputers have the necessary power and with the price of memory still following Moore's law, the price per bit is still falling rapidly.

So the technical and service environment for a successful introduction of MHP in Germany is looking pretty good. This leads to the final and essential point to be considered. That is the attitude of the consumer who has to purchase new equipment and subscribe to the new services. Different to the vertical markets of the pay TV world of the past, in a horizontal market the rapid introduction of technologies cannot be enforced by an operator, but each consumer makes his personal decision about it. That makes the process slower and more vulnerable as the consumer's decision is based on cost, benefit and convenience. If he does not get an emotional kick from the new services, if they are neither cool nor 'life stylish', then he may want to spend his money differently. That is the challenge!

However, in a German market that has about thirty free-to-air public and private TV stations, a pay TV operator not using a return channel, widely accepted satellite services, an analogue based cable network and a digital terrestrial service that has started positively, there should be enough competition and a potential for good ideas. Ideas that will get customers excited about new things that give them something special that they always wanted but never expected to get on their screens. And that certainly will be MHP based!

Dr. Helmut Stein - Chairman DVB - PCM and founder of International Strategies for Digital Media (ISDM)

In My Opinion - Anil Chopra
DIGITALWALLAS

Digital TV in India as yet only means "Digital Channel" as popularised by satellite broadcasters on their own promos in 'going digital' to deliver 'best quality'. Otherwise, most members of CETMA, the Indian TV manufacturers association, don't have a clue about the DVB-T project by Doordarshan, India's only terrestrial broadcaster. And digital TVs are as yet unavailable in India. India is definitely not in the transition stage anytime now, though if you visit the office in New Delhi of R K Gupta, Chief Engineer, Doordarshan,

the implications of future growth and future standards, etc., even the funding is forthcoming, and generously too, for a country such as India, but with regard to the DVB-T project, with all due respect to Doordarshan, the attitude is that DVB-T might never have anything to do with the public or viewers, and is only a perpetual digital experiment to reward the Doordarshan engineers for their technical excellence!

The one hundred odd Indian language satellite broadcast channels in every regional language meanwhile are state-of-

the CAS deadline the interactivity hype is underway in the mainstream media announcing to the Indian middle class a new utopia in the digital domain. Some telecom companies are promising interactive digital TV, frenetically investing millions of dollars on fiber optic networks.

India I always say is a poor country full of rich people, and the prospect of watching the latest spicy Bombay Dreams *fillum* in the back seat of one's chauffeur driven car is the only excitement that DVB-T is tantalizing.

"Some telecom companies are promising interactive digital TV, frenetically investing millions of dollars on fiber optic networks."

you cannot fail to notice the 'oblong' (16:9) flat digital TV with a distinctly sharper image in comparison to the 'square' (4:3).

As chief engineer of possibly the world's largest network of terrestrial transmitters (1314 in number) it ought to be a gravely exciting challenge introducing digital TV, however, the sense of urgency was missing, but pride in declaring Doordarshan as a frontline DVB-T broadcaster is justified. After all Doordarshan has commenced DVB-T broadcasting in New Delhi and digital terrestrial broadcasting is supposed to expand in the country in a phased programme spanning 10 to 12 years. The tenth five-year plan provides Rs 35 billion for going digital. Policy is perfect, like all things in India, progressive and modernist to a fault, fully understanding

art-digital, with digital decoders in the millions. Encrypted signals for the *cablewallas*. Yet India does not have any DTH, PPV, or CAS, so really speaking there is no digital reception into the homes. It's happening now though. 31 July 2003 is the deadline for all metros to go on CAS. Doordarshan is all set to launch its DTH bouquet of 20 channels on KU band in 2004. In fact DVB-T has been specifically discounted on two counts a) high capital cost and b) remote direct access for DTH serving all the objectives, commercial as well cultural, of a state owned broadcaster.

With regard to the raison d'être of digital TV, that is high quality fonts, text, graphics and most of all interactivity, none of the digital satellite channels has even mentioned the word, because the actual signal into the home is not digital. But with

Anil Chopra is founding editor of the professional audio video & broadcasting publication Studio Systems. Launched in 1986, Studio Systems has served the interests of the broadcasting industry reliably in India providing a credible source of information to the Indian broadcast fraternity.

Anil has organized, in association with the AES India section, the PALM (Pro Audio & Live Musician) Studio Systems Conference in 2001, 2002 and 2003 will be the third successive PALM conference. Studio Systems also organizes the PALM exhibition and technical seminar and the Cinema India Exhibition and Conference on Digital Cinema. The Studio Systems website can be found at www.studio-systems.com.
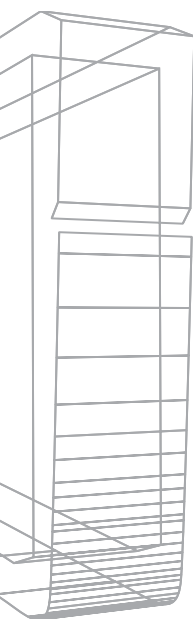
OPERA STUDIES

In 1994 when the plans were made to begin reconstruction of the new Liceu opera house at its historic location on Barcelona's La Rambla, all those participating shared an idea. The idea was to build an opera house for the 21st century, in which technology would play a leading role, and would be able to meet the challenges that the new information and communication technologies were beginning to set.

The result was a modern theatre, connected to the major communications networks, in which audio visual technologies have a key role, with a stage and auditorium that are probably the best equipped in the world.

Today, the Liceu is working towards the full development of the theatre's technological possibilities. These developments are bringing the art of opera to new audiences, especially young people.

In early 2001, the Gran Teatre del Liceu decided to implement the Opera Oberta project. The project would experiment with different ways of spreading opera at the highest quality levels permitted by technology.

The result was the live broadcast in December 2001 of the opera "La Traviata" in the Cinesa Diagonal digital cinema, in high definition format. At the same time, a very high quality signal was broadcast across the Catalan academic network to the universities of Lleida and Girona and the Polytechnic University of Catalonia on its Barcelona and Terrassa campuses.

The result of that experience encouraged the Liceu to consider continuing with it,

especially in the university environment. The project received a new definition, with its mission being to spread the art of opera among university students around the world.

As a means of fulfilling this resolution, it was decided to structure the project as a University course that would have curriculum value for the students.

New requirements, such as the need to provide subtitles in various languages simultaneously or content security during Internet distribution meant that it was necessary to define a new technical architecture. This took the form of DVB technology.

The encoding is MPEG-2, which enables information ratios of over 10 Mbps to be obtained, supplying a better image quality than that of DVD. This encoding was successfully tried in the pilot test for Opera Oberta, and has provided highly satisfactory results in the first year of the course.

Using the SDI (Serial Digital Interface) 270-Mbit signal from the 6-8 robot cameras in the theatre, the production team feeds the DVB-MPEG2 encoder.

As far as audio is concerned, an MPEG1 encoded 3 to 384 kbps layer stereo mixture is transmitted, and in the next course, a 5.1 (surround sound) Dolby Digital 640 kbps stream will also be transmitted.

Simultaneous subtitling in various languages requires specific equipment and is one of the greatest technical difficulties in the project. The use of DVB enables the inclusion of subtitle

streams in a single MPEG2 transport stream containing the audio and video MPEG2 stream, synchronising all the signals. Clients can thereby select the language in which they wish to see the subtitles.

The maintenance of the rights to the productions to be broadcast and compliance with legal obligations makes encryption of the transmitted signal essential.

For this, VPMN (Virtual Private Multicast Network) techniques are used, based on the creation of a virtual private network at each end, i.e., encryption before the output router and decryption after the input router, thereby allowing the destination universities' firewalls to be crossed without any problem.

The Irdeto Access system chosen is very similar to the systems used by digital television platforms and operates based on keys entered in a card and the periodic change of the encryption keys used.

Broadcasting is carried out by creating two multicast groups. The first contains an MPEG-2 transport stream which includes all the content (audio, video, subtitles and control tables), and the second contains the codes necessary for decoding the content.

The involvement of the universities in the project also is an excellent opportunity for the participating technical managers to exchange opinions and to establish new relationships and enhance their knowledge of todays' advanced technologies.

Göran Lindgren,
SVT's MHP Project Leader

ADDING
VALUE
24/7

Although a launch date hasn't yet been confirmed, Swedish public service broadcaster Sveriges Television (SVT) is fine tuning an exciting new raft of interactive services for digital viewers that will exploit the power, flexibility and growing industry support for MHP.

A key player in the NorDig industry alliance, SVT has already signalled its commitment to MHP as a common standard for delivering digital interactive services. With its recent investment in the Sony Open DataCast platform, the broadcaster has streamlined all aspects of authoring, distribution, scheduling and control of data services for its ongoing MHP pilot.

SVT has spent the last couple of years experimenting with the creation of interactive services on the back of the proprietary OpenTV API. High profile examples of this experience have included an audience voting system for digital viewers of the Swedish Eurovision qualifier round, and an application providing background information about award winning movies and performers in Sweden's equivalent of the annual Oscars ceremony.

As SVT's MHP Project Leader Göran Lindgren explains: "In return for a lot of hard work developing these services we've gained some invaluable lessons. While we've learned an enormous amount, these projects have primarily been one offs. The challenge now is to focus on moving forward to a new generation of 'always-on' services enabled by our migration to MHP that are available 24/7 to add some real value to the viewing experience."

"A crucial thing that we want to achieve with our approach to MHP is to benefit from transparency between all the various ways of DVB transmission", continues Lindgren. "In other words we want to create a single transport stream containing audio, video, and data services - namely MHP applications - that we can deliver to all networks and operators, regardless of whether they're terrestrial, cable or satellite." SVT boasts the Nordic region's most avidly viewed Teletext service with almost three million viewers daily. Following the recent implementation of a new content management system, the broadcaster is confident that open interfaces with the Sony Open DataCast platform will dramatically simplify the task of repurposing content across Teletext, iTV and web platforms.

SPECIAL
DELIVERY

In an initiative that is hoped will open the door to new content distribution scenarios to PCs, PDAs and mobile phones, Tandberg, NTL and Microsoft delivered real-time video content at bit rates as low as 150 kbit/s using Windows Media 9 Series in a recent demo in the US. TV news from Europe and live UK radio broadcasts were distributed to a Windows XP PC and Pocket PC using DAB and DVB transmission standards.

The demonstration utilised RadioScape infrastructure technology to build a DAB data stream for file transfer of cached audio and video clips to PDAs, as well as live streamed audio/video content to a Windows XP PC. It also showcased an end-to-end DVB-S broadcast system.

The video sources were encoded using Tandberg Television's EN5920 real-time hardware encoder for Windows Media 9 Series. The DAB audio and video sources were IP encapsulated and multiplexed through RadioScape's Digital Radio Broadcast suite of products. The DVB and DAB streams were uplinked by NTL from the UK to one of the 24 high-powered Ku-band transponders on PanAmSat's Atlantic Ocean Region satellite PAS9.

A satellite receiver dish, located at the demo site, downlinked the signals enabling them to be decoded for re-transmission over DAB.

The DVB feed was decoded by a satellite receiver card within a Windows XP PC delivering high-quality live content at a data rate of 1.5 Mbit/s and displayed on a large plasma screen.

The DAB transport stream was first decoded by a QPSK satellite receiver before being retransmitted by NTL from a low-power local DAB antenna. This retransmission makes a 'real' DAB digital radio signal available at the location.

GEM
Q&A
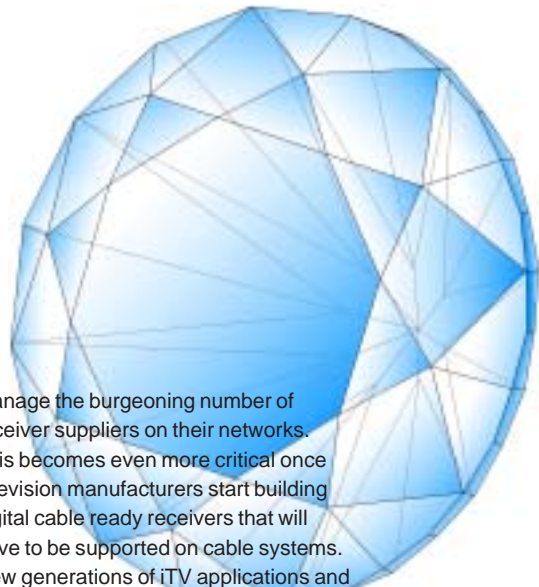
In the last issue of DVB-SCENE, Bill Foote the Chairman of the MHP Umbrella Group introduced GEM (Globally Executable MHP). The goal of the new specification is the adoption of the core of MHP as a universal global standard where iTV applications can be authored once and work in all markets. With the adoption of MHP by CableLabs as the core of its OCAP specification and the recent announcements on the harmonisation of standards for iTV in the U.S., DVB-SCENE puts some questions to Don Dulchinos, CableLabs VP of Advanced Platforms and Services.

What is the status of OCAP development in CableLabs?

OCAP 1.0 and 2.0 are stable specifications, and OCAP 1.0 has been standardised as SCTE 90-1. We are now engaged in completion of the OCAP Test Suite, and have just begun utilising a preliminary OCAP implementation to refine the test environment.

How are OCAP, MHP and GEM related?

The simplest answer is GEM is the common part between MHP and OCAP. The MHP Umbrella Group (MUG) was created as a vehicle for keeping MHP and OCAP in sync as much as possible going forward as well.

In December 2002, CableLabs and ATSC issued a joint release about middleware harmonisation involving OCAP and DASE - how is this related to the question above?

Digital broadcasting in the U.S. has run behind its introduction in Europe. As part of efforts to speed what is known as the digital transition, the U.S. cable industry sought to bring ATSC's DASE specification into harmony with the work CableLabs has done with DVB on GEM. The harmonised specification does not alter the hard won unity of GEM at all, and so developers already working on either MHP 1.0.2 or OCAP 1.0 may continue at full speed.

When do you expect to see the first OCAP receivers becoming available?

Based on responses to the CableLabs RFP for OCAP solutions, several U.S. cable operators are developing OCAP solutions for their leased, set-top box deployments. Some of these may be in field trials as early as the end of this year. On the television manufacturer side, Samsung has signed a license with CableLabs (PHILA) that enables it to build two-way television receivers with OCAP, and is in current development of such a product. Negotiations are underway between U.S. cable companies and television manufacturers to establish ground rules that may result in OCAP-enabled television receivers to be developed in 2004.

Is OCAP likely to be adopted outside the US?

The existence of GEM means that essential portions of OCAP are already being adopted. There may be some features unique to OCAP that will be of particular interest to operators of bi-directional networks, and may lead to some preference for OCAP solutions. We are working closely with DVB as they evaluate whether some of those features might be adopted in future versions of MHP.

How do you view the current economic climate's impact on the deployment of iTV (interactive television)?

I think cable companies have the ability to weather short-term ups and downs, and their current strategies revolve around driving penetration of first generation digital services like digital cable programming, EPGs and especially video-on-demand. As these services may be introduced into already upgraded cable systems, capex requirements are not a limiting factor.

What is the major commercial driver for iTV with US cable operators?

Same as any other prospective service, return on investment. It's important to distinguish between OCAP and the services it enables. The first task of U.S. cable operators will be to port their first generation EPG, VOD and other interactive applications to OCAP. But the first big payoff will be the ability to manage the burgeoning number of receiver suppliers on their networks. This becomes even more critical once television manufacturers start building digital cable ready receivers that will have to be supported on cable systems. New generations of iTV applications and services then can follow, drawn by the growing footprint of OCAP-enabled consumer devices.

How do you view the CableLabs relationship with DVB?

This has been an extremely rewarding relationship. I think Dick Green and Theo Peek broke through with a framework for cooperation that made an ongoing relationship practical. I think So Vang, our director of software, has established a solid working relationship with Ulrich Reimers as our contribution to the DVB Technical Module, under which the MUG serves as a great vehicle for moving our respective standards forward in alignment. Our attorney Jud Cary has been able to positively contribute to the DVB IPR Module with the help of Anthony Dixon and Carter Eltzroth - getting a stable IPR regime for both GEM and OCAP are priorities of ours. And I've committed to support efforts of the DVB Commercial Module for MHP, led by Georg Luetteke and Peter McAvock. The U.S. cable companies are eager to leverage DVB's work to build a community of software integrators, tool builders, and equipment manufacturers for GEM and OCAP.

Do you think there is a real opportunity for a single worldwide open middleware system?

I think we're well on the road to such an animal. There is a clear motivation on the part of service providers to get to common middleware so that content can easily be repurposed around the globe.

What are the next hot topics on the CableLabs agenda?

We have direction from our membership to both help solve the practical challenges of operating an OCAP environment in their systems, as well as build on the capabilities of the OCAP platform to explore revenue opportunities in areas like video-on-demand, interactive advertising, and in-home networking.

SPOTLIGHT ON
KOREA AND CHINA

In Asia, operators and their vendors are rolling-out MHP services and proving its commercial viability. According to David Mercer, VP, Global Broadband Practice, of Strategy Analytics "The success and leadership shown in Asia, and particularly in Korea shows what can be achieved. It could also give Korean vendors a valuable head-start in European and other global MHP markets."

MHP in Korea has progressed because the government advocates open standards to promote price competitiveness and help the national industry to export its open standard contents and products. The Korean strategy has already been proven to be successful. Already three MHP 1.0.2 set-top boxes are available from Samsung Electronics, LG Electronics, and Humax, with more set-top boxes in the conformance test process.

All three set-top boxes are powered by middleware from Alticast, an iTV solutions provider established in Korea. Moreover, now that MHP and the OCAP standards are merging, Korean companies are well positioned to be among the first to get OCAP set-top boxes to the market. For the past year, LG and Alticast have been working on an OCAP set-top box for cable operators.

On 21 May, SkyLife launched SkyTouch, one of the world's first commercial data broadcasting services distributing 50,000 first generation MHP set-top boxes. Altogether, it targets 350,000 MHP boxes during 2003. SkyTouch launched an initial service with fourteen services, mainly games and information services.

A set-top box with return channel will be deployed in July. An MHP based HDTV service will be available by the end of 2003, and a combined HDD (for PVR service) and HDTV service will be available in the first half of 2004. This phase is significant because it will provide one of the world's first examples of an integrated satellite/broadband/PVR solution making a wide range of new applications possible.

In January 2002, the Chinese State Administration of Radio, Film, and Television (SARFT) delegated a technical committee to evaluate the commercial viability of MHP. In February 2003, the committee finalised its recommendation to adopt all modules defined in MHP with a simplified Chinese font set as the middleware requirements for all Chinese operators and broadcasters and submitted it to SARFT for review. The SARFT review is expected in the Autumn and the impact of the decision will be far reaching when Beijing broadcasts the 2008 Olympics. All the enhanced data could be broadcast and received seamlessly by other operators around the world.

Shenzhen is planning to launch 20,000 digital cable set-top boxes (without MHP service) by the end of this year. There are a few more steps before the MHP set-top boxes will be deployed and Alticast and Shenzhen are in trial stage with MHP set-top boxes. But with digital cable broadcasting underway, Shenzhen already markets its digital television services with pay TV packages.

Korea and China are hoping to create mature DVB-MHP environments with many European, US, and other Asian operators watching closely the precedents and models set by SkyLife and Shenzhen Cable TV.

STANDARDS FOR BUSINESS

Dr. Michael Sharpe of ETSI takes a look at the new standards guidelines for Europe

In March, European standardisation policy was brought up to date as the result of the adoption of new guidelines for co-operation between the European Commission (EC), the European Free Trade Association (EFTA), and the three official European Standards Organisations (ESO); CEN, CENELEC and ETSI.

The new guidelines now appear in the Official Journal of the European Communities and are thus available in all the official Community languages (http://europa.eu.int/eur-lex/en/index.html and search for Official Journal C91 from 2003).

The document reflects the changes in standardisation over the previous nineteen years, since the last guidelines and reinforces the role of recognised standards organisations in supporting EU Policies. In particular, standards are seen as a preferred route rather than technical regulations to achieving policy objectives.

While recognising the formal status of European Standards (EN), ETSI has pioneered the use of other deliverable types (for example TS and ES) which are developed under the same disciplines of transparency, accessibility, openness, efficiency, coherence and voluntary application.

These new deliverable types are produced using faster procedures, allowing the standards base to react quickly to market needs, a critical plus in this quickly developing market sector. This activity is encouraged under the new guidelines.

The new guidelines encourage the standards bodies to work with groups like the DVB project with a view to possibly transforming their output into deliverables of the European Standards Organisations. The DVB Project has been an active contributor in the JTC (Joint Technical Committee) Broadcast, chaired by the EBU, supported by ETSI with the participation of CENELEC.

The guidelines also encourage the European Commission and EFTA to consult to the ESOs on matters relating to standardisation and trade, and to co-operate on global aspects. New initiatives for digital television under the Framework Directive are the subject of mandates addressed to the standards bodies and JTC Broadcast are expected to take a leading role in the work generated under such mandates.

CHANGES FOR TAIWAN

Dr. Chi-Fang Huang, Associate Professor of Tatung University, Taiwan

Dr Huang led the team that carried out the field evaluation on ATSC 8-VSB and DVB-T COFDM systems in Taiwan, and explains the background to Taiwan's decision to change its digital television transmission standard to DVB.

As a key supplier of consumer electronics to the world, Taiwan recognises the manufacturing opportunities presented by digital broadcasting as well as offering high-end digital TV services to its people. The government and Taiwan's broadcast industry view this new technology and services as a means of extending the nation's economic strength in the post-PC era.

In 1998, the government announced the adoption of the U.S. ATSC transmission standard. However, the trial testing in 1999 in Baltimore executed by Sinclair Broadcasting attracted deep concern worldwide about the performance comparison between the European

DVB-T COFDM and the ATSC 8-VSB systems. Moreover, it was especially noted that the mobile reception which is associated with DVB-T COFDM, could be a new business opportunity from the broadcasters' point of view when data broadcasting is added.

Subsequently, the Television Academy of Arts & Sciences, ROC, decided to conduct intensive field tests in order to evaluate the capabilities of ATSC 8-VSB and DVB-T COFDM.

The project looked at three items, namely outdoor fixed point, outdoor mobile reception and indoor fixed point measurements. The testing involved 108 locations for outdoor, 12 long highways or streets with high/slow speeds and 103 points inside seven buildings. According to the data of the field measurements, the following conclusions may be drawn in evaluating the two different digital TV transmission systems.

For the outdoor fixed point reception, DVB-T is better than ATSC by statistics, yet not so obviously. As reported by the other countries, basically the vision quality is mainly dependent on the strength of LOS (Line Of Sight). In Taiwan where most people live in high rise buildings, the concept of traditional terrestrial broadcasting is not suitable. As a matter of fact, many of the tested locations could not receive basic reception using the ATSC system. So, the European DVB-T system seems more suitable to such a situation.

As for fixed point indoor reception, DVB-T is obviously superior to the ATSC system, mainly due to the COFDM modulation scheme being capable of dealing with the multipath signals. Moreover, it could be skillfully used to enhance the reception by those signals. Especially when the receiver is not on

the LOS, DVB-T is able to provide good reception. For some situations where the low end of the channel spectrum is destroyed because of the usage of a pilot signal, ATSC is even worse for reception without regard to the received field strength. Technically, DVB-T is a better candidate for indoor reception.

For mobile reception, it was shown that the ATSC system is not able to function for such a service. Due to the optional

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low data rate modulation and coding scheme DVB-T is capable of mobile reception. Also, the DVB-T COFDM modulation technique has the function of managing, instead of 'overcoming', the multipath signals, making it a strong point and a good solution for mobile reception.

The results of the project were submitted to The Directorate General of Telecommunications, Taiwan, for consideration, and it was thus decided that Taiwan would adopt DVB-T for the transmission of digital terrestrial television. With the penetration of cable TV being nearly 80% in Taiwan, DVB-T and its ability to offer easy reception was most welcomed.

VIETNAM DIGITAL PROJECT

Vietnam's Ho Chi Minh City Television (HTV) has purchased a Harris DVB-T transmitter for its trial digital transmission project. The trial began on 30 April and will run for one year before the project is officially launched.

"For this project we needed a medium-power DVB-T transmitter that has the same control mode as other high-power transmitters," said Mr. Thai Hanh, Vice Manager of Technical Management Department, HTV. "This is so the operators will experience a smooth transition to the high-power transmitters that will be installed when official digital transmission begins."

Key features of Harris's DTV640/750T DVB-T transmitter include a sophisticated air cooling system, a web-based graphical user interface, alarms which can be sent by SNMP or email, and high compactness and modularity with a wide range of options. In addition, HTV opted for a state-of-the-art exciter from Harris' DTV 660 series.

HIERARCHICAL
MODULATION

A synopsis of a paper by Alexander Schertz (left) and Chris Weck of the Institut für Rundfunktechnik (IRT)

Hierarchical modulation (HM), a variant of DVB-T, enables the transmission of two independent DVB-T multiplexes on a single TV frequency channel, with different transmission qualities (high priority and low priority). The high-priority multiplex can be used, in particular, for portable indoor and mobile reception.

In DVB-T, HM is designated as an alternative to the conventional modulation methods used (QPSK, 16-QAM and 64-QAM). With the use of

The big advantage of HM, however, is that two data streams having different transmission performance are available within a single TV frequency channel.

In addition to obtaining two independent data streams in HM, the data stream with the lower data rate is less susceptible to noise than it would be in a non HM scheme. At the same time, the HM data stream with the higher data rate is not noticeably less robust than an equivalent data stream in a non-

given to utilising the principle of HM, in order to confront a fundamental problem of digital transmission - the abrupt breakdown in reception below a critical field strength level. If, in the case of MPEG source encoding, a coarse and a fine resolution were to be divided up into two data streams (SNR scalability) then, with appropriate HM, the reception would not fail at a single stroke when the field strength diminished at the reception location. Instead, the resolution of the

"...two data streams having different transmission performance are available within a single TV frequency channel."

HM, two autonomous DVB-T multiplexes can be transmitted on a single TV frequency channel.

The DVB-T standard defines a method for transmitting MPEG-2 encoded TV signals, adapted to the specific features of the terrestrial transmission channel (e.g. multipath reception). Its basis is COFDM (Coded Orthogonal Frequency Division Multiplex) modulation technology which uses thousands of narrow-band frequency carriers that are orthogonal to each other.

hierarchical realisation. The total data rate of the two HM streams is identical to that of a non HM scheme. The net data rate will be slightly lower because twice the MPEG-TS overhead is incurred in the case of HM, on account of the two multiplexes.

The data streams of HM vary in their susceptibility to noise. In other words, the service coverage areas differ in size. The better-protected data stream is referred to as the High-Priority (HP) stream; the other one is referred to as the Low-Priority (LP) stream. Compared with non-HM, the HM data stream with the lower data rate can be used to supply a larger coverage area, whereas the coverage area of the data stream with the higher data rate is only insignificantly smaller than for the corresponding non HM variant. This subdivision alone can be of practical benefit.

Originally in the development of the DVB specification, careful consideration was

source encoding would initially decrease by one stage.

This possibility was not actually realised in the DVB-T standard because it would have increased the hardware costs of the source decoder in the receiver and would not have been compatible with standard MPEG decoder chips.

However, the transmission side application of the HM principle is incorporated in the DVB-T standard. Here, the varyingly robust constellations are utilised for the transmission of different programme multiplexes with unequal priority (high priority, low priority) over one frequency channel.

Of course, different sized coverage areas are not always desirable for the programme multiplexes broadcast by a transmitter. But should this really be a fundamental objection against using HM? It must be kept in mind that even without HM, different sized coverage areas can be inevitable because the radius depends on the power constraints at any considered frequency. (Because of national and international frequency co-ordination, DVB-T multiplexes cannot in most cases be operated on different channels with the same transmission power). Coverage areas also depend on the selected method of modulation and on the code rate. It is therefore advisable to verify, in each specific case, whether HM would be a better alternative under the existing constraints.

It has been demonstrated that HM enables greater overall data supply
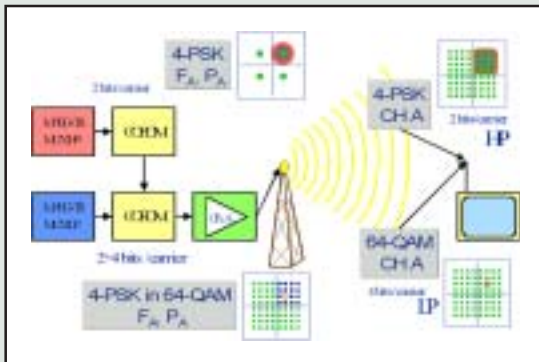
4-PSK and 16-QAM separated over two TV channels using non-hierarchical modulation
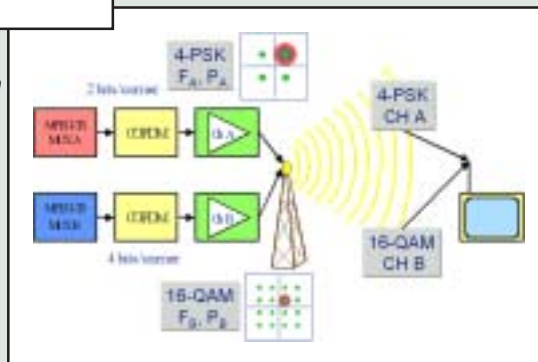
4-PSK in 64-QAM over one TV channel using hierarchical modulation

capability than non HM. However, HM should only be used if it fulfils the broadcasters existing service requirements. For example, using the HP multiplex to broadcast major programmes and the LP multiplex to broadcast supplementary programmes

"...can also be used to accommodate more programmes in the multiplex..."

is quite conceivable. The HP programmes can be received on portable and mobile equipment over the surrounding rural areas. The LP transmissions are suitable for stationary reception in rural areas and portable reception in the higher populated areas or in the proximity of the transmitter, respectively. The higher data rate of the LP stream can also be used to accommodate more programmes in the multiplex or, in the future, to broadcast HDTV programmes for displaying on high-resolution screens.

In certain thoroughly realistic cases, HM can represent the better alternative. It provides two autonomous multiplexes (HP and LP) over a single TV frequency channel. The total data rate (HP + LP) of

4-PSK in 64-QAM is higher than in the case of non HM using 16-QAM (the reference system). A portion of the HP data rate can be used in particular for portable indoor and mobile reception. With this arrangement, very flexible service coverage concepts can be

developed for future requirements.

To ensure that HM actually becomes available to digital terrestrial broadcasters as a future option, the receiver industry should incorporate the relevant parameters of the DVB-T standard in their firmware from the very outset (presently, it is less thoroughly considered in some aspects of the receivers. control software / firmware). Furthermore, the transmitter industry in general should follow the lead of several manufacturers by making HM available as an option for their transmitters.

The complete paper by Alexander Schertz and Chris Weck can be on European Broadcasting Union website at www.ebu.ch/trev_home.html.

The views expressed in this newsletter are those of the individual DVB members or guests and are not necessarily the views of the DVB Project Office or Steering Board.

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