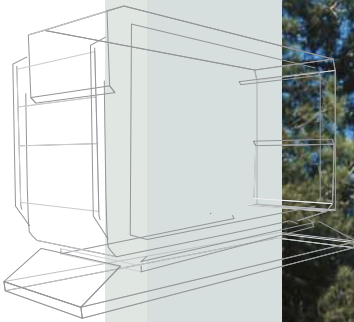


Viva Digital

DVB - SCENE

Tune in to Digital Convergence



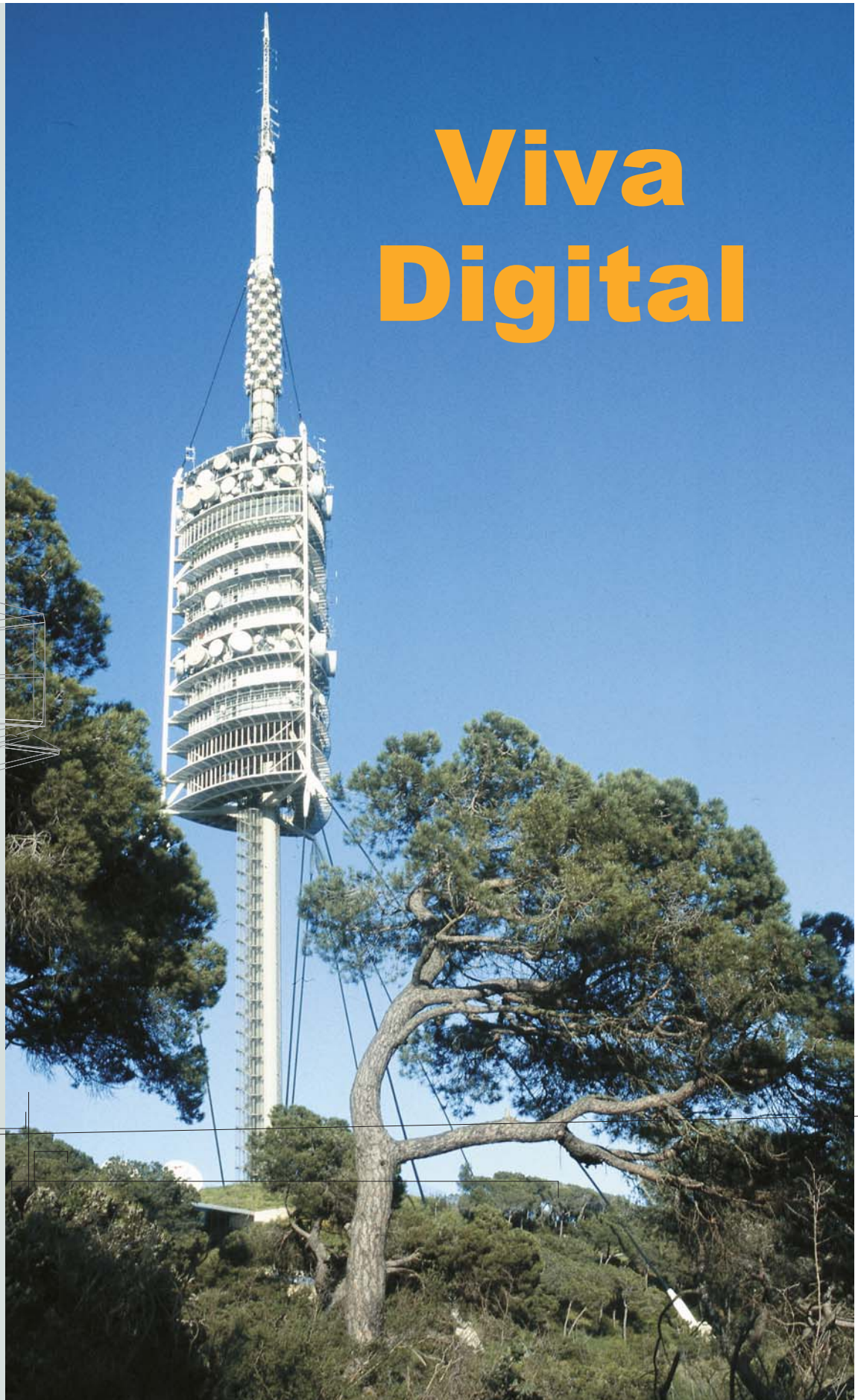
08

DVB®

The Standard for the Digital World

This issue's highlights

- > DVB-S2 Launches
- > Update: DTT In Spain
- > DVB-T Mobile In Australia
- > New Codecs
- > DVB World 2004



DVB World 2004

Mark your diary now... **Dublin, 3 - 5 March**

DVB at the Crossroads

With ten years of success in digital television, and with multimedia delivery systems now being used throughout the world, DVB has entered a new phase where the focus must be on new challenges and opportunities in media delivery.

How can the media delivery world capitalise on the convergence of multimedia APIs and help those with legacy APIs?

How should the DVB project best serve the personalised reception needs of the new generation audience?

How and when should DVB and PDR go to the altar for their long-awaited marriage in this highly price-sensitive industry?

Is the time approaching for high public demand for HDTV video and multi-channel sound as home cinemas fall in cost and become widely available?

DVB World 2004 provides the only opportunity to receive a direct briefing from all of the DVB Chairs. If you are in digital media you cannot afford not to be there.

There are sponsorship and exhibition opportunities available – please ask for details.

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A word from the DVB Project Office

RENEWED VIGOUR

As we reach the end of 2003, we come to reflect on this 10th year of the DVB Project, and look forward to the exciting developments in the coming years. Internally, the Project has just held its 11th General Assembly and this gathering elected the 6th DVB Steering Board. In the DVB world outside, we have just seen the re-launch of Spanish DTT, and movements in the Czech republic as well as developments on the MHP front in the US and Japan. This issue of DVB- SCENE includes news on DVB-S2 and exciting results from tests done on Hierarchical Modulation in Australia.

Korea has become the centre of attention recently with a debate raging about the suitability of the incumbent

ATSC system for the delivery of digital terrestrial television in today's highly competitive media landscape. With the advent of multimedia telecommunications services and the proliferation of satellite and interactive cable services, Korean broadcasters are asking themselves whether it wouldn't be a good idea to review the DTTB system selection and the criteria which drove this process. Broadcasters and many industry players are anxious to ensure that digital terrestrial television can take advantage of the 'tether-less' link between the broadcaster and the viewer. Recent experiments in Australia have shown spectacular results with the latest generation of DVB-T receivers. Australia runs DVB-T services carrying HDTV and simulcast SDTV; thus, the receiver market and the associated planning targeted fixed receivers. The current generation of DVB-T receivers has shown us that this (8K, 64QAM) DVB-T environment can also receive pictures in vehicles - this is an enormous boost for DVB-T supporters in the Australian broadcasting industry, and further vindicates their decision to adopt DVB-T in 1998. John Bigeni gives a tour of Sydney with the current DVB-T receivers.

H.264 and other advanced video/audio codecs are still high on the agenda in DVB. Aside from the significant performance advantage over traditional codecs, standards such as DVB-H (the standard for delivery of DVB services to handheld devices) will ultimately rely

exclusively on advances in them to ensure that the services can be appropriately targeted to the small screen sizes typical of the handheld environment. DVB has finalised its coding technology implementation guidelines for the delivery of IP based DVB services based on H.264, but is withholding publication of this key DVB document pending clarification on the all-important licensing issue from both Via Licensing and MPEG-LA.

There have been recent announcements about the adoption in the US of ACAP, a middleware standard bringing together CableLabs' OCAP and ATSC's DASE, both Java based middleware standards. In fact, ACAP is heavily based on DVB's MHP, and extensively references Globally Executable MHP (GEM). This is excellent news for application developers who can target MHP (and GEM) in the knowledge that their applications will run on DVB and non-DVB networks around the world.

Finally, don't forget that registrations are open for DVB World 2004 to be held on 3 - 5th March 2004 in Dublin. Topics to be discussed at this year's conference will be the latest news on DVB-H, DVB-S2 (the ultimate satellite distribution standard), and of course the latest updates on DVB and MHP issues world-wide. DVB World is an important part of the DVB calendar - providing a view of what is going on in digital television globally, and also providing the time for the Project to reflect on its work.

Cover: The cover of this issue shows the Tower of Collserola near Barcelona. Designed by Lord Foster the tower has a total height of 288 meters is located in the Collserola mountain range which runs parallel to the Mediterranean Sea. The location is a place known as Turo de la Vilana and is situated 445 meters above sea level. The construction rises to 268 meters. The tower consist of three parts: a concrete shaft, just 4.5 meters; a tubular steel mast 38 meters high and taking the tower to its full height, a 45-metre stretch of latticed steel.

Thirteen platforms, with a total floor area of 5,500 meters were constructed between the 84-metre and the 152-metre points of the tower. The tenth platform was designed as a public viewing deck 560 meters above sea level, affording excellent views of the city and its environs, the Mediterranean and 70 kilometres of the Catalan hinterland. The viewing deck is reached from inside the mountain by elevator which travels up the outside of the concrete shaft. The elevator is glazed to allow panoramic viewing, and its speed of one meter per second takes the public to the observatory in under two minutes.

A second lift is exclusively for access to the maintenance area of the telecommunications installations. The base of the tower, which is built into the mountain, houses a reception area and cafeteria.

DVB-SCENE acknowledges Alex Mestre at Retevisión for his contribution to this issue on the re-launch of DTT in Spain.

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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NEW MEMBERS

Opentech Inc.

ProTelevision Technologies A/S

Kabel Deutschland GmbH

It seems very appropriate to announce that, in DVB's 10th anniversary year, the second-generation specification for satellite broadcasting, DVB-S2, is ready to be released.

Alberto Morello, Director of The Research & Technical Innovation Centre, RAI, and Chairman of DVB-S2 ad-hoc group, explained: "The DVB-S2 standard has been specified around three key concepts: best transmission performance, total flexibility and reasonable complexity. The 'tool-kit' approach allows all the application areas to be covered while still keeping the single-chip decoder at reasonable complexity levels, say 10 mm² of silicon, thus enabling mass market cost reduction also for professional applications."

To achieve the best performance, DVB-S2 benefits from more recent developments in channel coding and modulation. The 'engine' of the system, the LDPC code, was selected from amongst seven proposals, and the comparison required something like one million Gbit simulations and 40,000 days of computer work. The result is a 30 percent capacity increase over

DVB-S under the same transmission conditions and more robust reception for the same spectrum efficiency. DVB-S2 is so flexible that it is able to cope with any satellite transponder characteristics, with a large variety of spectrum efficiencies (from 0.5 to 4.5 bit/s per unit bandwidth) and associated C/N requirements (from -2 dB to 16 dB).

When used for interactive point-to-point applications like IP unicasting, the gain of DVB-S2 over DVB-S is even greater. Variable Coding & Modulation (VCM) functionality allows different modulations and error protection levels to be used and changed on a frame-by-frame basis. This may be combined with the use of a return channel to achieve closed-



DVB-S2 is a giant step forward from DVB-S, itself a highly successful transmission standard for satellite broadcast and interactive services established less than ten years ago. The estimated 35-40 percent satellite capacity increase can significantly reduce the recurring cost of broadband satellite networks and services. The twenty plus combinations of modulation and coding formats over a 15 dB range of signal-to-noise ratio offer system designers the opportunity to optimize power and bandwidth tradeoffs. This feature coupled with its built-in capability to change formats on a frame-by-frame basis provides us with unprecedented flexibility for next generation systems and new applications. Due to their near Shannon Limit performance, reachable only with infinitely complex codes, network service providers can also rest assured that the DVB-S2 equipment they deploy will unlikely be superseded from any practical standpoint for decades to come.

Dan Fraley, Chief Technology Officer, Hughes Network Systems

S2 READY FOR LIFT-OFF

TO BOLDLY GO FORWARD



Alberto Morello, Director of The Research & Technical Innovation Centre, RAI

Shannon Limit) that nobody will ever have to develop a DVB-S3 specification."

Peter MacAvock, Executive Director of the DVB Project Office, remarked "The DVB doesn't see DVB-S2 replacing DVB-S in the short term. Millions of DVB-S decoders are already operating in robust conditions contributing to successful digital satellite businesses around the world. New applications are being envisaged for satellite environments such as the

loop Adaptive Coding Modulation (ACM), thus allowing the transmission parameters to be optimised for each individual user, dependant on path conditions. ACM allows the reuse of the 4 to 8 dB of power (the so called 'clear sky margin') which is typically wasted in conventional satellite links, thus doubling or even tripling the average satellite throughput and reducing dramatically the service cost.

In its design the DVB-S2 system has been optimised for several satellite broadband applications: broadcast services, interactive services including Internet access, digital TV contribution

"... so flexible that it supports any input stream format..."

and satellite news gathering, data content distribution/trunking and other professional applications.

DVB-S2 is not limited to MPEG-2 video and audio coding, but is designed to handle a variety of codecs (MPEG-2, MPEG-4, HDTV). It is so flexible that it supports any input stream format, including continuous bit-streams, single or multiple MPEG transport streams, IP and ATM. This future proofing will allow other current and future data schemes to be used without the need for a new specification.

Professor Ulrich Reimers, Chairman of the DVB Technical Module commenting on the successful work of the DVB had this to say "DVB-S2 is so powerful and so close to the theoretical performance limit (the so-called

delivery of consumer HDTV and the delivery of IP based services. A few examples can highlight the revolution we have in front of us. Combining DVB-S2 and the MPEG-4 AVC video coding schemes recently introduced in DVB, up to 20-25 SDTV or 5-6 HDTV programmes may be broadcast in a conventional 33 MHz transponder. In the area of fast Internet connection via satellite, combining the DVB-S2 ACM technology with multi-spot Ka band satellites and DVB-RCS return link, current satellite capacity prices can be reduced by a factor of 10. This may re-open the competition with terrestrial infrastructures, such as ADSL and fibre optics, at least in rural areas. In these new application areas, DVB-S2 will do what DVB-S could never have done."

MANUFACTURERS TAKING THE LEAD

EXUDING CONFIDENCE

The consumer electronic manufacturers are taking a giant step for the development of DTT in Spain. At the SIMO consumer electronic show in Madrid in the first week of November the leading manufacturers launched in the Spanish market the first DTT receivers to be distributed to the horizontal market in time for the Christmas season.

On the DTT stand at SIMO Retevisión, alongside Spain's other key broadcasters, with the support of the Ministry of Science and Technology and nine manufacturers jointly presented a wide range of receivers covering all the needs of consumers.

Sony, Samsung, Philips, Panasonic, Pace, Nokia, Loewe, Hauppauge and Finlux presented a complete line up of receivers ranging from zappers, MHP set-top boxes including some with hard disk drives, widescreen MHP IDTVs and IDTVs incorporating hard disk. Several demonstrations were made using various MHP applications available on air. Stand visitors were even treated to a competition to win free set-top boxes.

The joint promotional campaign is considered to have made an important impact in delivering the message to consumers that all the manufacturers and key broadcasters are pushing the



DTT stand at SIMO

same offer: 'Discover Free Digital TV. More channels, More Quality and New Content available for a one off payment'. That message is supported under the umbrella of a single logo to help the consumer identify digital ready television products.

The importance of this mood of confidence shown by the manufacturers belies the fact that the Spanish Administration has yet to reallocate the frequencies that were previously taken by the fourteen channels operated by QuieroTV.

A DRIVING FORCE

Carlos Estévez, Director of RTVE Digital

All the stakeholders involved in the re-launch of DTT in Spain agree on one aspect and that is that there is the need for a leading entity to be able to ignite the process, and all of them point to the content leader that holds a very important brand recognition. They look to RTVE, the public broadcaster.

It is RTVE's intention to develop a DTT model based on an open and free proposal for everyone, following the successful Freeview model running in the UK, initiated by the BBC.

In order to face this important challenge, probably one of the most significant in its recent history, RTVE

is willing to contribute with a wide offering of content to satisfy viewer expectations with news, entertainment and other services.

The successful roll out of this plan relies on three basic things: the existence of adequate channels in order to bring the content package free to air; the creation of a free to view platform under the leadership of RTVE involving as many content providers as possible; and the adequate financial model to kick start the project.

It is our expectation that in a very short period of time we will reach



such an agreement and can therefore break the current vicious cycle.

Carlos Estévez, currently is the Director of RTVE Digital. In the past he had several management responsibilities at RTVE including Director of Content, Director of Regional Centres and Diplomatic Correspondent as well as other responsibilities at Antena3.



Consumer broadcasting is continuously evolving, with multiple targets including higher quality content, high definition transmission, more channels, interactivity, and mobile/portable data terminals, all of which need increased efficiency of bandwidth use.

STMicroelectronics, a world leader in MPEG2 technology since 1994, is now leading the development of DVB-S2 demodulators and H264/WM9/MPEG4 part 10 A/V decoder system-on-chip devices that will power the new set-top boxes very soon to be on the market.

ST's DVB-S2 solution will enable HD transmission or SD compressed video over satellite at comparable cost to current DVB-S QPSK set-top boxes.

This ST technology will enable the realisation of the broadcasters' and consumers' dream of 'more content and better quality audio/video at lower cost'.

Armando Caltabiano, Satellite and Terrestrial STB Business Unit Director, STMicroelectronics

Advantech is proud to have been a contributor to the emerging DVB-S2 standard and to be forging ahead with early product introductions of modulators and demodulators for the professional broadcast industry. Over time we see this new standard as having a much greater range of applications than the current DVB-S, including telecommunications and Internet transmission. The coding and modulation systems proposed offer a seminal leap forward in system performance, enabling a strong business case for its adoption. The inclusion of Adaptive Coding and Modulation also offers a degree of future proofing which, we believe, will ensure that DVB-S2 enjoys a long life at the forefront of satellite technology.

Mark Lambert, Director of Sales & Marketing for Advantech in the EMEA region.



KEY DECISIONS

Anatolio Alonso Pardo

Representative in DVB Steering Board Ministry of Science and Technology Spain

their transmissions in June 2002.

- The five channels of the traditional analogue, private and public national broadcasters were transmitted in a multiplex for national coverage with provincial requirements (implemented by fifty-two SFNs for provincial coverage) since April 2002.

“...the impetus should come from the creation of a wide variety of free channels...”

Unfortunately, this DTT model based mainly on a pay TV offer resulted in commercial failure. Quiero TV ceased its transmissions in 2002 and its spectrum capacity was returned to the State in May 2003. Obviously, this fact forced a reshaping of the DTT strategy. Now, the impetus should come from the creation of a wide variety of free channels, occupying the vacant 3½ multiplexes.

This model established by the Technical Plan also includes regional and local services. The Plan includes one multiplex with four channels per region (nineteen regional coverage SFN), to be licensed by the regional governments. At present, six regions have awarded licences for DTT services (public, private or both). Two of them, Catalonia and Madrid, have services on air since the middle of 2002. Another five regional governments have announced plans to award licences in the near future.

For local DTT services, the Parliament last year approved a modification of the Local TV Law, which established digital as the only permitted technology for local broadcasters and fixed July 2004 as the deadline for awarding local licences. The Local DTT Technical Plan will be adopted before the end of this year replacing local

analogue stations' transmitters with digital transmitters to cover two hundred local districts.

Together with regulatory measures, the Government is carrying out a variety of actions to give a boost to DTT:

- An agreement for the implementation of MHP sponsored by the Minister of Science & Technology was signed on 15 February 2002 by the leading manufacturers and broadcasters.

- A Digital TV Forum was established as required by the agreement. It is open to participation by all organisations and companies or personalities interested in promoting the development of digital television in Spain.

The Forum has created five working groups addressing matters such as the public education strategy, audience measurement and navigation, e-Government services using MHP, service parameters, interoperability, software updates, coexistence with analogue signals, etc.



Finally, to summarise the situation on DTT in Spain, we should view today as a key moment in the effective deployment, with the strong commitment of all the parties involved, and the impending key decisions and agreements to take advantage of the upcoming exceptional year for broadcast media with the Olympic Games, the European Football Cup, and the Royal Wedding.

Spain was the third country in the European Union to introduce digital terrestrial television services. The regulatory framework to make it possible was approved by the Spanish Government in October 1998. That decision was a coherent consequence of the active role played by the Spanish government, broadcasters, network operators and the DVB.

The model for DTT in Spain took into account some basic conditions:

- The overcrowded spectrum for TV bands. That led to the choice of the 8K option of the DVB-T standard to make viable SFN for the large geographical extension for both national and regional territories.
- The territorial organisation of Spain, with strong political and administrative autonomy at regional and municipal levels. Accordingly, national, regional and local coverage channels had to be allocated.
- DTT was considered an important tool to promote the Information Society for all social sectors.

The DTT National Technical Plan, approved in October 1998, established a spectrum allocation for national DTT services with the following elements:

- Fourteen digital channels (in 3½ multiplexes through national coverage SFN) for a concessionaire offering pay television. These services, offered by Quiero TV, started in May 2000.
- Two channels were reserved for free TV, in the remaining half national coverage multiplex. The licensors started



LAYING FOUNDATIONS

Josep Ventosa Sales & Marketing Director, Retevisión



There is a consensus in Spain to base the re-launch of DTT on a mainly free TV business model, offering free digital TV to the consumer, with more channels, improved picture and sound quality, new entertainment and information content, as well as easy installation.

DTT will offer the consumer the chance to enjoy more free channels with a similar quality to that of DVD, increased participation and interactivity, and all simply by buying and installing a digital receiver or set-top box.

The re-launch must be content driven but, in order to broadcast this content it is absolutely necessary that the government reassign the frequencies that Quiero TV has vacated and that the national public broadcaster

becomes the leader in the process.

To be a success the free TV model needs an horizontal market frame for receivers where people can buy digital integrated receivers or set-top boxes in the distribution chain. This can only happen if there is the existence of a technological framework where content, applications and products can be developed. Once the technology is in place, it becomes important for a coordinated effort among the relevant players to develop the market and to create the demand for DTT.

In fact, for many years we have had two independent markets running in parallel with almost no interaction, on the one hand, the broadcasting market (formed by advertisers, network operators, content providers and broadcasters) and on the other, the consumer electronics market (manufacturers, retailers, aerial installers). Now is the time for both markets to coordinate their activities and come out with the right message to the consumer and at the right time.

Retevisión is putting a great deal of effort into cooperating with all the players offering the DTT technological platform already available and into becoming the DTT technological facilitator for whoever requires it. Out of this, several activities were put in place to push the market forward. Back in June the ActúaTV Project set up the basic technical elements and together with Telemadrid several MHP applications were put on air utilising SMS as a return channel. Then five manufacturers and two major retailers (Carrefour and El Corte Inglés) got involved to start demonstrating services and products in the retail stores.

In July, Retevisión went on air jointly with the national public broadcaster, TVE, with a demonstration of interactive applications based on the archive content of Informe Semanal, which

was celebrating its thirtieth anniversary.

In the beginning of November at the consumer electronic show, SIMO, in Madrid, and together with nine manufacturers, five broadcasters and the support of the Government, Retevisión successfully set up 'The DTT Stand' with a unified message targeted at the consumer. When you take into account that all these manufacturers are now launching product into the market with a unique concept and under a single umbrella it creates a very important impact on the consumer. For that reason a single logo identifying DTT was designed and adopted.

In parallel, DigiTAG came to Madrid to host one of its seminars to analyse the Spanish situation.

It is clear that there are still a few more steps to climb, but it is also clear that with the massive introduction of DTT receivers this Christmas and the right commercial offer, the basic foundation for a successful DTT market is already in place.

The Torrespaña, Madrid



ActúaTV Project Promotion

MAKE IT FREE



Elizabeth López,
Digital Content & Interactive
Television Manager, Telecinco

It is not difficult for today's commercial broadcasters to make the transfer from analogue to digital. However, it is important that you have the right business model to ensure that the investment pays off. Here in Spain after being one of the first countries in Europe to launch digital terrestrial television three years ago we are still faced with the problem of how to actually make it a success. Tele 5 is actively involved in finding a solution. As it turned out, Quiero TV, Spain's first venture into DTT employed the wrong business model, and it failed. Today we are left with that legacy. One of the main sticking points of this legacy is the reallocation of the spectrum used by Quiero TV and the provision of the necessary bandwidth to implement interactive services. Spain also has a healthy digital pay TV market which could hinder the acceptance of DTT in the market. It is important that if we are to make another attempt at DTT that this time we get it right. There is no room for second chances.

There is strong evidence that retailers and consumer electronics manufacturers have the confidence to enter the DTT market. Now what we need from the government is a formal agreement stipulating the conditions and a realistic timeframe for the real transition to digital.



BARCELONA INTERACTION

TESTING MHP SERVICES

Joan Rosés, TVC Multimedia Manager

In the last quarter of 2003, Catalonia launched a unique project in digital terrestrial television. One hundred homes in the Barcelona metropolitan area were invited to try out the advantages of digital television. MHP interactive services, broadcasts in 16:9 format, digital audio and encrypted signals are all part of the digital package that users are testing every day for a period of three months.

This pilot project, called 'Micromercats', uses Televisió de Catalunya's digital transmissions. Companies such as TVC Multimedia, CCRTVI, LaSalle Engineering and Communi.tv, in addition to the main manufacturers of televisions and decoders, Sony, Philips, Panasonic and Samsung have all taken part. The project is backed by the Department of Industry of the Catalan government.

More than two thousand users were initially selected through various websites and applications. This sample was analysed to ensure that it was representative of the society. Selection criteria took into account technical capacity, socio-demographics and attitudes towards new technologies. Selected candidates were asked to register through the system's user registry. The application also provided step-by-step installation instructions and technical support.

The MHP interactive applications developed by TVC Multimedia offer an EPG, news tickers, weather forecasts, programming and special events, chat and text messaging, and interactive advertising.

Special components for tracking users and profile management provide useful feedback on how the applications and services work.

Data compiled from these studies and surveys will help determine consumer preferences with respect to receivers, usability, look and feel, value analysis, customer service needs and installation process.

Today's digital technology should give Spain's television viewer a greater choice and higher quality environment in which to view content and together with interactive services offer them a level of participation of their choice. Spain has a tradition of free to air TV.



The terrestrial television viewer, unlike the pay TV subscriber, is accustomed to free television services. This formula for DTT with extra channels and a freedom of choice should be of great value to the viewer. That's what free viewing is all about!



CZECH STRATEGY

of CT1, CT2, Prima TV, Galaxie Sport and Ocko via Eutelsat's Eurobird.

UPC Direct, a commercial DTH service started in 2001 reaching 61,000 subscribers by the middle of 2003.

East Box Digital was awarded a DTH licence in 2002 and has announced that its services will launch in December 2003.

The licence to digitalise the Czech cable networks was awarded to Karneval Media (formerly TES Media and Intercable), the number two service provider in the cable TV market. DVB-C technology tests are scheduled for some time in the next two years.

In 2000 CDG and the traditional broadcast network operator, České Radiokomunikace (CRA), each launched DTT test projects in Prague to speed up DTT in the Czech Republic. The CDG DTT project is based on an SFN consisting of three transmitters on new sites in Prague, while the CRA DTT project covers two transmitters on existing television towers in the

city. The plan was made for frequency 46 for CDG and 25 for CRA. Both of these projects cover territory around fifty kilometres from the centre of Prague. Since 2000 there has been a multitude of tests carried out, including MHP interactive services, to prove the reliability of digital transmissions. There are currently four CDG channels on air, five CRA channels and three radio channels on each of the two multiplexes, some carrying demonstrations of MHP services.

The business plan of the Czech Digital Group, wholly owned by FTV Premiera, the licence holder of the national commercial station Prima TV, covers the potential scenarios for frequency planning, as well as legislation limitation. As February 2004 is the next milestone for the possible governmental acceptance of the DTT strategy in the Czech Republic, CDG and its owners are planning for a DTT roll out in early 2004.

Digital television distribution and digital broadcasting began in the Czech Republic seven years ago. The first joint venture of the Czech Digital Group (CDG) and UPC (formerly Cable Plus) called Czech Link was launched in 1996 with the aim of distributing nationwide, the Czech television channels CT1 and CT2, TV Prima and Cable Plus (Hallmark) to transmitter sites and cable head-ends. Non-commercial DTH was also a consideration. Czech Link services began in 1997 and currently offers a five channel package

PRO TV IN SWITZERLAND

Television subscribers throughout the Rhone valley are now enjoying the full benefit of DVB-T in the form of a wider choice of programmes, excellent picture and sound quality. Originally eight analogue channels were transmitted in this area with four of the channels owned and operated by the local municipality. In 1999 the municipality decided to upgrade to digital technology rather than simply renewing their ageing analogue equipment and selected the general contractor, Mamie Rundfunktechnik Switzerland to develop, plan & install the entire system.

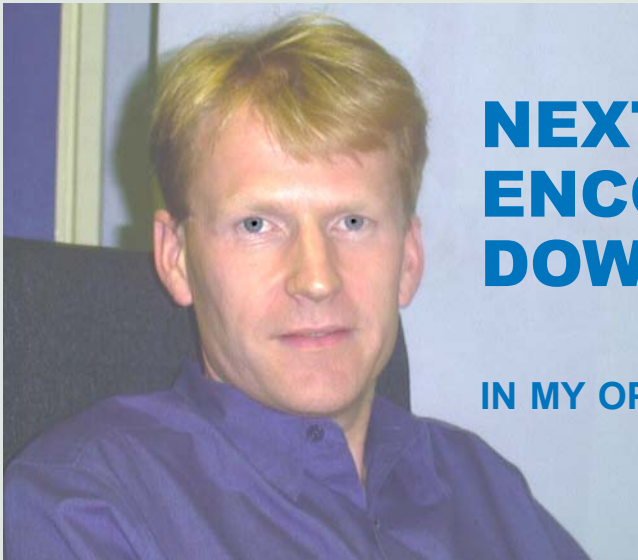
An initial investment in new digital head-end equipment and DVB-T transmission equipment was made in 2001. This first roll-out included four primary DVB-T transmitter sites and twenty-one transposer sites. This investment increased overnight the number of TV programmes available to the subscribers from only four to thirty-seven and in addition thirty-two radio programmes. The package is all managed by a NagraVision CA system.

During the first year of operation, it was found that the use of traditional digital converters for DVB-T at some



of the more 'difficult' sites was not an ideal solution. Interference from strong adjacent channels at the affected sites meant that the bit error rate and modulation error ratio of the processed signal were rapidly degraded below acceptable levels. Several optimisations of the equipment were tried without success. Mamie Rundfunktechnik decided to try the new DVB-T Re-

modulator PT 5788 from ProTelevision in Denmark. The highly selective state-of-the-art tuner and the full demodulation before re-modulation featured in the product provided the long sought after solution. The results obtained by using the Re-Modulators were amazing, after a cascade of five transposers, the signal quality remains the same as it is at the main transmitter.



NEXT-GENERATION ENCODING: THROWING DOWN THE GAUNTLET

IN MY OPINION – JOHN MOULDING

Some major themes emerged from IBC this year including an apparent consensus that the future of DTT is as a free-to-air platform, the reinvigoration of HDTV in Europe, and the technological potential (rights permitting) for video to become increasingly mobile. But for me the story of the show was the decision by Microsoft Windows Digital Media Division to submit its Windows Media 9 (WM9) Series video compression technology to SMPTE to be standardised, and the simultaneous announcement by encoder vendor Harmonic Inc. that it would support the WM9 codec for real-time, broadcast quality compression by NAB next year, on its new Divicom MV 100 encoding platform.

Harmonic thus joined Tandberg Television (which announced its EN5920 WM9 hardware encoder at IBC 2002) as backers of the Microsoft technology. Scopus Network Technologies threw its hat into the ring too, with the announcement that its UniversalEncoder platform, which will be launched next summer, will support WM9, while other leading MPEG-2 encoder vendors like Scientific-Atlanta and Motorola Broadband refused to rule out working with Microsoft for next-generation encoding.

Harmonic's MV 100 will support the already standards-based MPEG-4

generation codec market share, but it was the moment the broadcast world accepted the company's presence and started to offer network operators a real choice for their post-MPEG-2 compression requirements.

Technically there is little to choose between these codecs, certainly not in the terms that a CEO or Chief Finance Officer would understand or care about*. Both WM9 and MPEG-4 AVC will deliver at least twice the encoding efficiency of MPEG-2, which means bandwidth savings or more services (or in the case of some telcos, it means they can offer multi-channel broadcast TV or VOD where it was simply not possible before). There is much debate about which technology offers the best picture quality at a given bit rate today, and which has the stronger core algorithm and the most potential for further improvements, but all of that is a sideshow when it comes to the issue of standardisation.

The fact is, the broadcast community likes standards, especially when it comes to compression. MPEG-4 AVC/H.264 is the standards-based technology everyone wanted but right now, the companies who hold core patents for this codec are still deciding what the licensing terms should be. On the eve of IBC, back in September, Via Licensing Corporation announced that

The licensing issue is in danger of holding up deployment of MPEG-4 AVC/H.264 encoders/decoders. Even before Microsoft opened up its specification via SMPTE, licensing was a competitive weapon for the company as it has already published its terms (www.microsoft.com/windows/windowsmedia/create/licensing.aspx) openly, and they are based on flat rate charges per device. Now, with the impending standardisation of WM9 Series, the MPEG-4 AVC supporting community is under pressure to resolve the licensing quickly, otherwise it will provide Microsoft with a window of opportunity during which it may get encoders deployed unopposed.

It is hard to overstate the significance of the standardisation of WM9 Series. In the first instance, it has won the support of encoder vendors who may not otherwise have built products based on the Microsoft inspired codec. Harmonic for instance, with its Divicom brand, is acknowledged as having some of the world's best encoders. Before September it was a firm supporter of MPEG-4 AVC because, from its market research, it believed the broadcast world wants standards whereas Microsoft was offering a proprietary technology. Harmonic says the decision to take

Only a widely backed, interoperable standard could mirror the competition seen in MPEG-2

AVC/H.264 codec too, again by NAB next year. UniversalEncoder from Scopus will also support MPEG-4 AVC, while Tandberg Television will introduce its own MPEG-4 AVC encoder in 2004 to complement its Windows Media next-generation offering. So IBC 2003 was not a glorious victory for Microsoft in the battle for next-

generation codec market share, but it had the support of nine key patent holders for its largely pay-per-device licensing model (where you pay X cents per decoder, and Y cents per encoder etc), following the pattern of the successful MPEG-2 licensing. MPEG-LA, which represents other patent holders, has not yet announced its terms.

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And of course, once you get many major vendors working on a codec, using their proprietary knowledge to improve the core algorithms or tweak the compression with pre-processing etc., you can expect the codec to improve over time.

MALAYSIAN CHOICE

DVB-SCENE recently spoke with James Sinclair, Director of Technology for NTL Asia Pacific about the company's DVB-T activities in Malaysia.

How do you see digital television rolling out in Malaysia?

Malaysia is well positioned to benefit from digital terrestrial television broadcasting (DTTB). The groundwork has been set by the Communications and Multimedia Act of 1998 (CMA98) which many consider to be one of the most forward looking communications and multimedia acts in the world.

There have been a number of significant developments in Malaysia on DTTB. A number of trial licences have been issued for DVB-T related services and some broadcasters have taken the opportunity to trial some of the more complex aspects of the DVB standards.

What is the status of DVB-T in Malaysia?

Malaysia has yet to announce the choice of a standard for DTTB. Indications are that DVB-T will be the choice but a formal decision is still pending. The Multimedia Commission issued a discussion paper in April seeking industry feedback on DTTB coverage, service and the migration from analogue to digital. The report on this consultation has not been published



as yet. A fifteen month consultation project, commissioned by the Government of Malaysia, to study the technical and commercial options for DTTB in Malaysia is nearing completion. NTL participated in this project and among the recommendations is adopting DVB-T with DVB-MHP as the choice of middleware.

Another key recommendation is a fully converged DTTB platform for Malaysia with broadcasters realising economies of scale through shared infrastructure and services. The EPG would be shared creating a single point of entry to viewers.

Recently, NTL signed a new partnership agreement with

AsiaSpace, why did NTL decide to partner with them?

AsiaSpace is well positioned in Malaysia. They have a full suite of licences and have a core focus on infrastructure development and the company brings its expertise and unique licence to supply and own broadcast towers and infrastructure in addition to their telecommunication towers, which have already generated significant interest. It's an important partnership for us as it paves the way for Malaysia to accelerate its development towards a truly shared infrastructure that will provide significant benefit to wireless services operators.

As well as the economic benefits and increased reliability that transmission infrastructure sharing brings, the sharing of towers will also significantly lower the number of new sites, reducing the environmental impact, which is also an important consideration for the government.

What is the timeline to start operations?

Development will be nationwide and initially focus in the two key areas of Putrajaya and the Klang Valley. AsiaSpace has already completed the first of its towers and is well under way to deliver a total of fifty towers by the end of this year.



Indeed, ever since Windows Digital Media Division committed WM9 to silicon, announced at IBC 2002 that it would allow the codec to be used on a broadcast quality, hardware-based encoder (Tandberg's), and proved its technical worth, the big argument in favour of MPEG-4 AVC has been that it alone was a standard. Only a widely backed, interoperable standard could mirror the competition seen in MPEG-2, which has resulted in continued encoder improvements that have driven broadcast-quality bit rates down from around 6Mbps in the mid-1990s to below 2Mbps today, with another 25 per cent improvement expected yet.

Only a widely backed, interoperable standard, the argument goes, can provide the durability needed in a market where legacy investments are

on a colossal scale. Again, MPEG-2 provides the benchmark. A set-top box decoder shipped in 1998 for example, can still decode the output of the latest and greatest MPEG-2 encoders at today's best quality.

So with Microsoft now promising a separate standard that is equally open (and the company says vendors will have access to the core code and the ability to modify and improve upon it), where does it leave the market for next-generation compression?

Three possibilities come to mind. First, by increasing the pressure on supporters of the MPEG-4 AVC/H.264 standard, it could bring about a swift resolution of the licensing debate and lead to the ultimate triumph of MPEG-4 AVC. Second, if the MPEG-4 licensing is not resolved quickly, and WM9 does

indeed achieve standards-based 'legitimacy', there is a slender but real chance it could become the de-facto standard for next-generation encoding itself. Third, there is no overall winner and we end up with two competing standards, with maybe one codec more dominant in the telecoms world (probably WM9) and one codec more dominant in the broadcast world (probably MPEG-4 AVC).

By going to SMPTE, Microsoft has thrown down the gauntlet. We must now watch to see how the fight ensues.

* If you are interested in the technical differences between MPEG-4 AVC and WM9, they are covered in the November/December issue of Cable & Satellite International. The magazine's website is www.cable-satellite.com



PLATFORMS, PLATFORMS, PLATFORMS!

Ian Valentine, Technical Alliances Director Sky Interactive

The DVB has been very successful at establishing early standards for digital broadcasting, with consequent near universal adoption. However, the same has not been achieved for interactive television services where, due to the lack of available DVB standards (until very recently), broadcasters have had no option but to use various proprietary standards. This has been good in the sense that the competitive nature of 'the middleware business' has stimulated innovation, but it has led to claims that there are interoperability problems.

Interactive services delivered via digital television fall broadly into two categories, firstly broadcaster driven enhanced television (e-TV), and secondly industry driven 'electronic lifestyle' services such as email, online information services and e-government.

In Europe, a number of solutions have already been successfully utilised to achieve interoperability of e-TV applications. These applications can often be authored once and automatically adapted to suit differing platform specifics.

However, no such solutions exist for the delivery of electronic society services from Internet infrastructures.

Even among digital TV platforms supporting Internet style HTML formats (and many do not!), differences in the 'flavours' supported by the platforms have required some re-authoring to support each one.

The DVB's 'Portable Content Format' (PCF) working group, under the chairmanship of the BBC's Graham Plumb, is now focussing on this issue in a significant initiative which could provide a unified model for the authoring of these services for digital TV platforms throughout Europe. The specification of such a 'Portable Content Format' will allow services authored for television to be deployed on almost any TV centric or 'small appliance' device (e.g. mobile phone, PDA). Instead of the service author managing differences between devices, the manufacturer or network operator will be able to dynamically transform each page of the service into a device specific form.

Whilst some criticise these initiatives as diverting attention away from MHP, the reality is that those who are in the process of deploying MHP based platforms probably stand the most to gain from this initiative, since MHP operators will be able to launch with services that have already been



developed for other platforms. It will be another good example of the industry working together to reach a consensus on solutions to technical problems.

As an encouraging sign of what can be achieved, BSkyB recently demonstrated on the DVB booth at IBC a range of interactive applications authored for its 'WTVML' browser running on different platforms, including MHP. These demonstrations showed two distinct methods for delivering interoperability, a browser running on an MHP set top box, developed by Espial, and a BSkyB developed 'Transcoder' gateway. The Espial browser, is able to natively display WTVML authored applications, directly from their application servers, and the transcoder is able to translate WTVML applications on the fly to a number of other HTML 'flavours' (e.g. Microsoft TV, Internet Explorer, Liberate etc). In both cases, the applications displayed were live BSkyB services, with zero re-authoring effort.

BOOK NOW

DVB AT THE CROSSROADS - DVB WORLD 2004

Digital Video Broadcasting has weathered a decade of intense development, its original objectives long ago achieved. Digital television on all the standard platforms is becoming the norm in most parts of the world.

At the end of ten years, the transition to digital being well under way, it is appropriate that we take stock of our achievements and look to the future. New challenges have manifested

themselves brought about by the public's ever increasing appetite for new media devices and services.

The DVB Project being at the centre of developments in broadcasting, computing and telecommunications has been in a unique position to identify these opportunities. A good example is DVB-H, 'television on the hoof', building on the phenomenal success of the mobile phone. Another example is the

reception of television on the personal computer again supporting portability with the emergence of wireless connection to the Internet.

These and other aspects of digital broadcasting will be addressed at the now well established conference DVB World 2004 which will be held in Dublin from the 3 - 5 March.

This is the annual opportunity for all involved in the various aspects of the

DISCOVERING NEW CAPABILITIES

DEMONSTRATING MOBILITY IN AUSTRALIA WITH DVB-T

There has been a very high interest worldwide by terrestrial broadcasters in mobile services. DVB-T mobile services are now operating in Singapore, Germany and Taiwan. The advent of diversity receivers has introduced another dimension to mobile services because in combination with hierarchical modulation it is now very feasible to provide both fixed receive services such as high definition television as well as mobile services in the one package at the same time.

DVB recently demonstrated extremely successfully the mobile reception of Australian digital transmissions.

Although these services are targeted to fixed aerial reception they include both HDTV and SDTV. All these transmissions are at the least robust mode of 64QAM and as low as 3/4 coding rate and 8K. In the recent past, this mode was not receivable under mobile and portable reception



Mr Yun Taeho (r) of KBS with John Bigeni (c) during the mobile demonstration in Sydney.

conditions. However, with the latest diversity technology, reception has been demonstrated in most of the Sydney service area. Signals were reliably received as far away as 40 km from the transmitter at speeds of up to 120 kph. At these modes the demonstration showed it is perfectly feasible to receive mobile HD. However, there clearly is no business case for such services. It also showed that using 16QAM (which is the preferred mobile mode for DVB-T) with diversity reception can deliver absolute reliability.

The receiver is a commercially available receiver manufactured by Hi Top and uses the DibCom chipset, which was developed specifically for such mobile applications.

John Bigeni of DVB demonstrated the system's capabilities to representatives from the Korean national broadcaster, KBS. It is understood that the Korean broadcasters are now reviewing their earlier choice of ATSC for digital terrestrial broadcasting largely because of this system's relative

shortcomings in providing mobile services. Mr Bigeni said that the absence of the mobile capability limits terrestrial broadcasters in effectively exploiting this unique capability, as well as their ability to compete commercially with satellite and cable service providers.

Mr Bigeni further noted "DVB-T has certainly come a long way and we are only now starting to see some of its capabilities. One of the most significant observations made during these demonstrations was the complete absence of any impulse noise interference. When driving in the CBD and on the expressway adjacent to heavy traffic one would have expected some noticeable effects but there was nothing but perfect reception."

Another interesting observation was the value of SFN operation for mobile. The SBS (Special Broadcasting Service), which operates at UHF, also operates its translators on the same frequency. For mobile this is invaluable, as in moving from one service area to another the receiver is completely oblivious of the change.

The KBS team accompanying Mr Bigeni on one of the demonstrations is compiling a documentary covering the issues underlying the debate on Korea's digital standard.

digital media to receive an update, directly from those involved in the Project including the Chairs of the DVB modules, on progress to date and expectations for the future.

Appropriately, the keynote address this year will be given by Professor Ulrich Reimers who has earned the well-deserved appellation of the 'Godfather' of DVB.

Registration for DVB World 2004, hosted by the International Academy of Broadcasting, will open on December 1st and intending participants are advised to register and book hotel accommodation early as March tends to be a busy time for Dublin hotels.

Further details can be found at www.iab.ch and www.dvb.org.



TRUE POTENTIAL

HIERARCHICAL MODULATION FIELD SURVEY AND STUDY

Roger Bunch, Director of Engineering, Commercial Television Australia

In 2001, Australian free to air broadcasters recognised no field or predictive testing had been undertaken on the DVB-T hierarchical mode of DVB-T transmission equipment or receivers. The FTA Specialist Group-DTTB identified that should hierarchical be implemented in the future, the parameters required in receiver design should be identified to ensure inclusion in DTTB receivers to avoid a legacy issue in the future.

The development of a field trial methodology commenced with a search of the literature on the topic already in the public domain. The literature search indicated that hierarchical broadcast transmission equipment and DVB-T receivers capable of receiving hierarchical transmissions should be subjected to bench testing to establish performance of the equipment to be used in the field trials, which would then evaluate the performance of the equipment:



within the licence area; beyond the licence area; and the robustness of the technology for mobile reception.

The Free to Air Specialist Group received support for the field trials from the Australian Broadcasting Authority, SBS, Rhode & Schwartz, NTL, ABC, Tx Australia, Network TEN, Seven Network, WIN and Nine Network who all committed equipment and staff time to the trials.

A consultant, BTC Australia, was engaged by Commercial Television Australia in June 2001 to develop a methodology for the field testing, data collection, technical analysis and presentation of the survey results. The field trials were undertaken in February 2002.

Analysis of the survey data confirmed enhancement of DVB-T transmissions using the Hierarchical Modulation (HM) mode over current non-HM transmissions. The overall finding was that both the High Priority, nominally many broadcaster's SDTV service, and the Low Priority (HP) stream, nominally many broadcaster's HDTV or multi-programme service showed significant improvement over non-HM modes of up to 8 dB in complex reception environments.

The relative extent of improvement using the HM mode is dependent upon the current transmission parameters used by a broadcaster, the hierarchical parameters chosen by a broadcaster and the performance of individual DTV receivers.

The following results were confirmed:

- a) The hierarchical High Priority (HP) stream, nominally many broadcaster's SDTV service, would provide strengthened coverage and robustness of the signal along with the potential for viable mobile reception. Dependant upon the hierarchical parameters chosen by a broadcaster the level of improvement would range from 2.5 dB to 8 dB over the currently received DVB-T non hierarchical transmissions.
- b) The hierarchical Low Priority (HP) stream, nominally many broadcaster's HDTV or multi-programme service, would see some decrease in the reception margin and coverage relative



to the current service. Dependant upon the hierarchical parameters chosen by a broadcaster the level of change in reception characteristics would be from no change in the coverage to a noticeable change in reception characteristics.

c) Hierarchical mode will provide an improvement of between 1 to 3.7 dB in shadowed location areas where an improved receiving system such as a masthead amplifier is used. The HP mode shows a greater tolerance to multi-path and has a lower field strength threshold.

d) The extent of over-spill into adjacent service areas is dictated by the mode of operation. In one hierarchical mode the reception would improve and provide a marginal increase. The extent of improvement being dependent upon terrain and the coverage area being considered.

e) Near continuous two hour mobile reception was achieved over motorways within a 25km radius of the transmission tower. It is clear from the results of the survey that for mobile reception to be successful, optimised antenna and receivers are essential. The diversity reception system has the potential to provide successful commercially available mobile reception with hierarchical transmissions.

TWO ARE BETTER THAN ONE

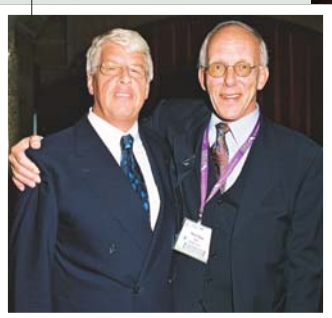
The first product from TeamCast's ModulCast family is a professional DVB-T receiver for implementing antenna diversity reception. Equipped with two antennae the receiver utilises spatial reception diversity to recover the broadcast DVB-T signal in the worst possible reception situations, providing a C/N advantage of not less than 6 dB, when compared with single antenna reception.

Offered as 'ready to integrate' the module offers DVB-T reception capability to professional products in the broadcast chain. The product is expecting to ship in the first quarter of 2004.

Another new product in the ModulCast family is a professional DVB-T modulator. Also a 'ready to integrate' module, this DVB-T modulator is able to manage up to four ASI inputs to

operate SFN and HM (Hierarchical Modulation) while offering input redundancy management. The core modulation supports all DVB-T modes and is ready for DVB-H upgrade. The modulated DVB-T signal is produced as an analogue IF signal. The TeamCast DVB-T modulator provides the state-of-art modulation at an affordable price. This product is expected to ship in second quarter of 2004.

10th ANNIVERSARY



At this year's IBC the DVB celebrated its 10th anniversary in great style. The DVB stand which also hosted demonstrations by ADB, Osmosys, Philips, BSKyB, Microsoft and Teamcast was an amazing success with visitors filling the stand over the entire five days. The highlight of the event however was the DVB anniversary dinner held at the prestigious Beurs van Berlage which itself was celebrating its 100th anniversary. The evening was a resounding success with many DVB founders and luminaries enjoying an evening with other DVB members and celebrating the enormous achievements of the past ten years.

Photos: Marilene Dubois, Tony Faustini and Goran Walkberg

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