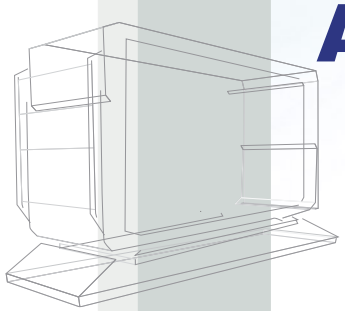
Edition No.20 **December 2006**

DVB-SCENE

Tune in to Digital Convergence



20

Auf Wiedersehen Analogue

DVB

The Standard for the Digital World

This issue's highlights

FUJITSU MICROELECTRONICS EUROPE
SmartMPEG-E DECODER

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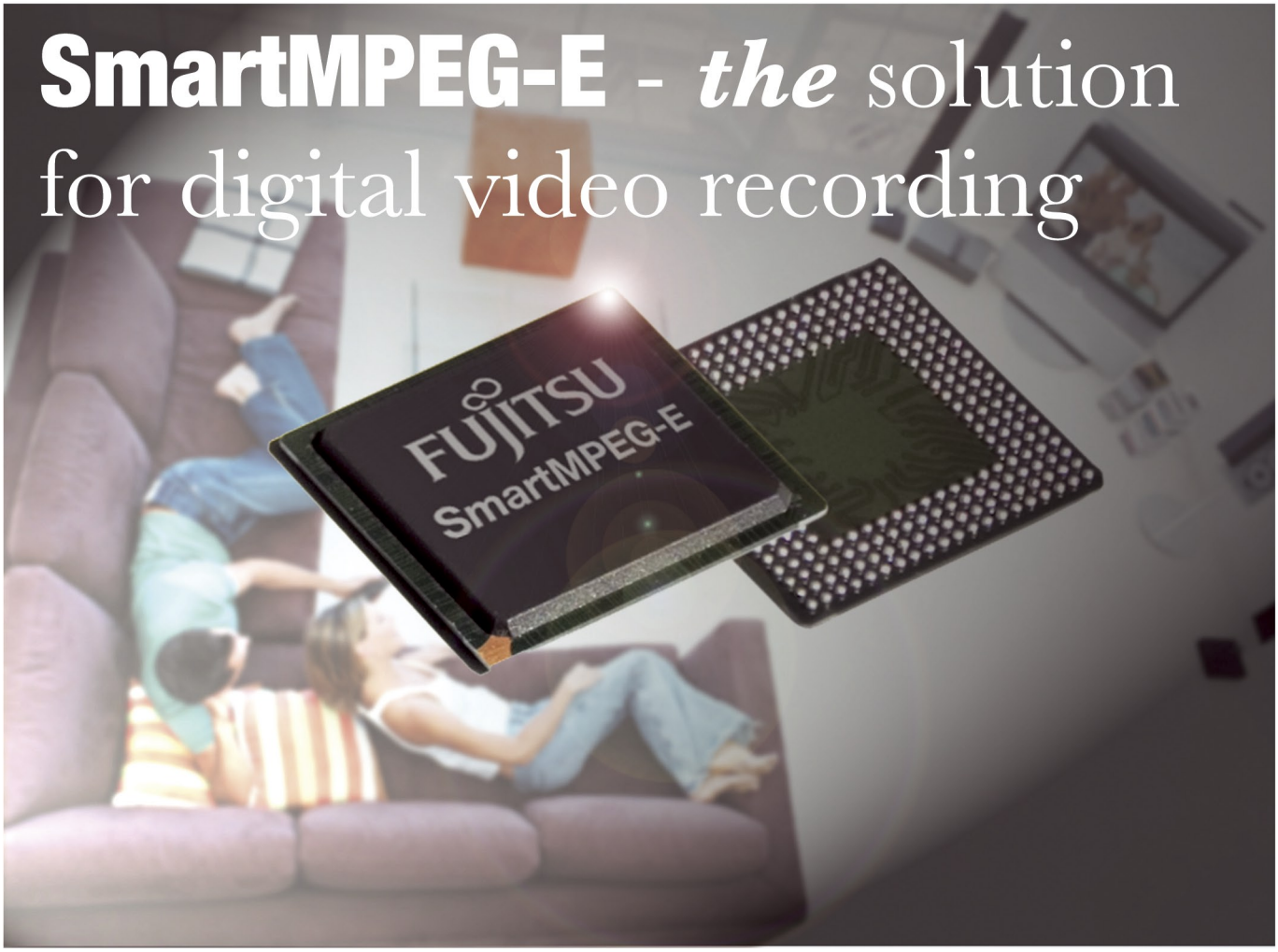
THE POSSIBILITIES ARE INFINITE

SmartMPEG-E - *the* solution for digital video recording

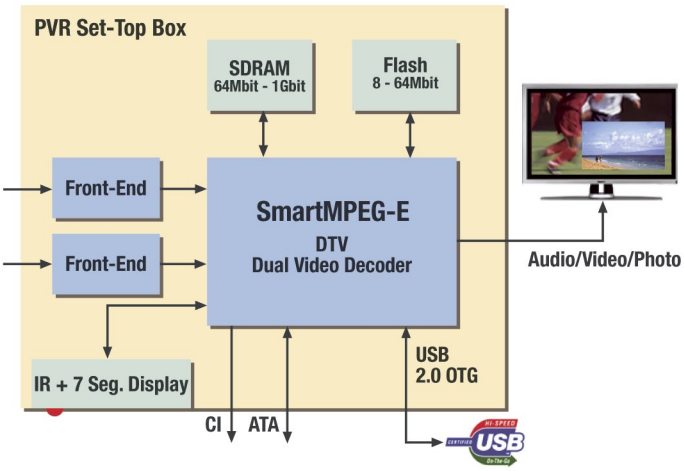


SmartMPEG-E is the latest member of Fujitsu's family of advanced MPEG-2 Decoders. It integrates all the features required for a cost-effective PVR solution:

- High CPU performance for added-value applications
- Dual MPEG video decoding
- High Speed USB 2.0 OTG
- A flexible configuration of interfaces
- Low power consumption

Plus Fujitsu's extensive software suit, covering full F-API, middleware and complete PVR application software.

SmartMPEG-E, was designed and developed in Fujitsu's European Development Centre.



MB86H30 incorporates highly advanced features such as high-speed USB 2.0 OTG functionality with both host and device.

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MORE GOOD NEWS

A word from the DVB Project Office

Peter MacAvock, Executive Director

Autumn and winter are typically busy months in the DVB Project, and this year is no exception. DVB's General Assembly (3rd November 2006) heard that the DVB Project, now in its 13th year is organising more meetings than ever on topics such as DVB-H, IPTV, MHP, Copy Protection and many others. In addition, DVB is currently investigating commercial requirements for DVB-T2 - a specification destined to exploit opportunities afforded by analogue switch off in many countries in the 2010 - 2012 timeframe.
Such work has attracted significant interest in many countries around the world choosing their digital terrestrial television standards for the future.

The most notable announcement has come recently from the Philippines where industry and government are recommending the adoption of the DVB-T standards for DTT services there. The Philippines currently uses NTSC in 6MHz channels for broadcasting, and their recommendation is a further endorsement of the abilities of DVB-T. We wish the Philippines well in their DTT future - and welcome them to the family. Finally, I would like to wish all DVB participants and DVB-SCENE readers the compliments of the season and good luck for 2007 from all of us on the DVB-SCENE editorial team and the DVB Project Office.

The DVB Project Office organised a high level seminar at the AutoWorld car museum in Brussels in September. Titled 'Driving Mobile Television', the seminar aimed to educate an audience of policymakers and regulators about the key issues facing those planning to roll out DVB-H services in Europe in the short to medium term. DVB-PCM Chairman Helmut Stein (pictured right) chaired the day's events, attended by more than 80 invited delegates. Also, pictured far right, from left to right, Alex Mestre (Abertis Telecom), David Bogi (Mediaset), Juha Ronkainen (Nokia) and Peter MacAvock (DVB).

Dr Ian Childs attended the very first meeting of the Working Group on Digital Television Broadcasting (WGDTB) which took place in Hamburg in June 1992. He represented the BBC in this meeting and was immediately nominated one of the two vice-chairmen of the group. Since that very first event Ian attended most of the 75 meetings of the WGDTB which later became the DVB Technical Module. In the early days of the work it had to be decided whether or not hierarchical source coding would be used in order to facilitate the transmission of SDTV and HDTV video in one stream. Dr. Childs volunteered to evaluate the consequences of this decision. He found out that the overhead resulting from hierarchical source coding would be so significant that the simulcasting of SDTV and HDTV videos would be preferable. The 'Childs factor' thus became one of the fundaments of the work in DVB. In addition to being vice-chairman of the Technical Module Dr. Childs was its special rapporteur on audio. "With Ian's retirement the Technical Module lost one of its key people and I lost an important advisor and a very good friend" commented Dr Ulrich Reimers, Chairman, DVB Technical Module on congratulating him on his nomination as the first Honorary Fellow of the DVB Project. (L-R: DVB Chairman Dr Theo Peek making the presentation to Dr Ian Childs.)

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Editorial and Advertising enquiries to: WHD PR
Email: news@whdpr.com
Telephone: +44 (0)20 7799 3100

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BAND WHICH?

UK Broadcast Networks for Mobile - What do we do?

Simon Mason, Head of New Product Development, Arqiva

One of the hottest topics at the moment in the industry is Mobile TV. Arqiva has conducted a number of trials in the UK that show there is consumer demand and that a broadcast one-to-many technology will be required to deliver customer satisfaction.

The main factors that will contribute to the success of Mobile TV are technology, handsets, spectrum and regulation. In the UK, the most problematic element is spectrum.

In terms of availability of suitable spectrum to be used for the delivery of Mobile TV services, UHF and L-Band are the most obvious candidates for terrestrial based systems.

This article looks at the options and issues around spectrum in the UK for Mobile TV.

UHF Spectrum

The UHF band is the cream of spectrum, because it offers a technically valuable combination of capacity (8MHz channel), small antenna on the handset at a reasonable gain and good propagation characteristics. The latter translates into reduced network density and therefore reduced deployment costs.

However, there is no guarantee of getting this spectrum for Mobile TV; there are a number of services that could occupy this band such as more standard definition digital terrestrial TV or new high definition TV services.

The UK, like many countries in Europe, is going through Digital Switchover (DSO). This is the process by which the five existing analogue television services are being switched off and the six existing digital terrestrial television (DTT) multiplexes are changing frequency and going up in power.

Ofcom, the UK regulator, estimates that up to 112MHz (or 14 x 8MHz channels) of spectrum in the UHF band will be released for new uses. This process of switchover in the UK is aimed to be completed by 2012.

Frequencies in the UHF band released by DSO are having their possible uses reviewed through the Digital Dividend Review (DDR) run by Ofcom. The DDR may give clarity on the use of the released UHF spectrum by mid 2007, but there is no clear opportunity to get early access to this spectrum pre 2012.

L-Band

The amount of L-Band spectrum on offer is 40MHz (1452 - 1492MHz), but only the bottom 25MHz is available for use terrestrially, the upper 12.5MHz being allocated for satellite systems.

The Ofcom consultation regarding this band closed in June 2006, and the terrestrial and satellite blocks are expected to be offered for auction in the first half of 2007. L-Band is coordinated internationally via the Maastricht

Table 1

	UHF	L-Band	Difference in dBs (positive value UHF better than L-Band)
Frequency MHz	600	1470	
Receive Antenna Gain dBd	-6	-4	-2
Channel width	8MHz	5MHz	
Height Loss (10m to 1.5m) dB	-16	-20	4
Penetration loss for sub urban dwellings	-12	-14	2
Number of channels	20	12	
Tx ERPs for a roof top (L-Band 3.0 dB greater)	3kW	7.5kW	-4
		Total difference	0 dB

Plan, which gives the UK the right to deploy 1.7MHz channelised services in this band, but also requires 1.7MHz channelised services in neighbouring countries to be protected. These rights do not currently extend to services and technologies other than those met by the definition of T-DAB (or its variants including T-DMB and DAB-IP).
The key disadvantage of L-Band over UHF is the Doppler performance of L-Band. As L-Band is approximately twice the frequency of UHF and Doppler shift is a linear relationship between speed and frequency of operation, the Doppler shift at L-Band is twice that of UHF. To accommodate this, the carrier spacing of the OFDM signal at L-Band is increased so reducing the number of carriers. To keep the data throughput constant, the symbol rate of the system is increased at L-Band but in so doing the guard interval is reduced to maintain the bit efficiency of the system. The size of the guard interval governs the size of the single frequency network (SFN) that can be built. The larger the guard interval the longer distance interference the network can tolerate. This gives UHF a significant advantage over L-Band.

Network Design Parameters

The key parameters for planning of Mobile TV networks include:

- Target carrier to noise performance for the receiver
- Tolerance to Doppler shift - the target speeds for the device operation
- Building penetration loss
- Type and quantity of spectrum available
- Receive antenna gain
- Rooftop safety in urban areas

In planning the network one of the key dominant factors in the network design is the RF safety limits on rooftops. In the UK, a mobile broadcast SFN design would be characterised primarily by low height transmit antenna and small cell size. In this case there is no significant risk of long distance self-interference from the site. However, the biggest factor affecting the coverage would be the effective radiated power (ERP) of the site and the height of the transmit antenna above the local clutter.
For an L-Band network, the transmit antenna height above the local clutter is very significant. The wavelength of an L-Band signal is smaller than UHF, and hence the L-Band signal diffraction is significantly less than UHF. This factor gives the signals being transmitted on UHF an advantage since it will generally have better building penetration characteristics than L-Band. However, the safety exposure limit at L-Band is higher than at UHF because the human body is less resonant at L-Band wavelengths. In highly populated areas such as city centres, the L-Band transmission could potentially provide a safer environment for the workmen having to access such sites.
Table 1 shows the main differences between UHF and L-Band for an urban or sub urban network, using DVB-H

in both cases. In built up areas where the sites are predominantly rooftops, there is little difference between L-Band and UHF when it comes to the number of transmitters. In contrast, if rural coverage is necessary, UHF is the most cost effective option as masts, as apposed to rooftops, tend to be used for rural coverage.

Adjacent Channel Interference Issues

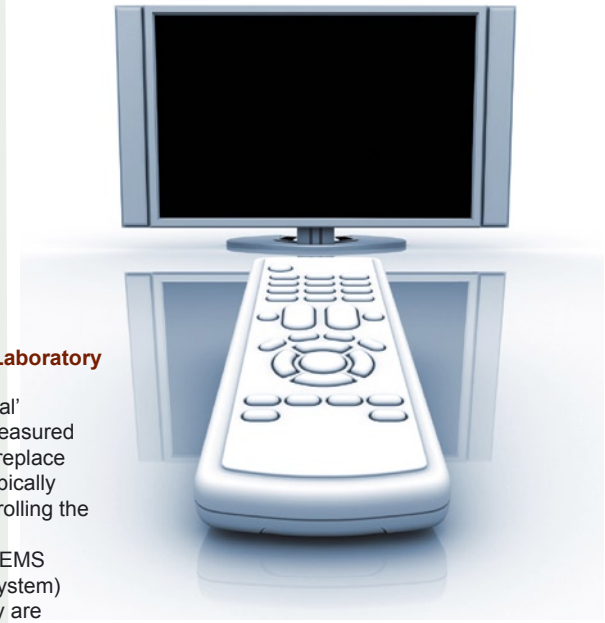
In band III the UK radio industry has had problems with adjacent channel blocking. This has been due to network operators rolling out their networks with different design criteria. Some networks have been designed for portable-indoors and some for handheld-indoors reception, with the latter requiring a higher density of sites to achieve the necessary field strength. This means that services on adjacent channels that are not co-sited will knock holes in the network transmitted from another site. Strict regulation could have helped to avoid this situation, however the UK regulator (Ofcom) with its light touch approach to regulations believes this is an industry matter and therefore should be dealt with by the industry.
This same problem may occur in L-Band and UHF as each network operator will have a different business model and possibly different target devices, thus designing the networks differently. This may create adjacent channel issues which could potentially bring extra costs to the network operators.

Conclusions

Finally, the table below summarises the overall comparison between UHF and L-Band.
To conclude the UHF vs L-Band debate, Arqiva believes that UHF is technically the most suitable spectrum for Mobile TV but that there are increased opportunities from aligning a timely L-Band auction with certainty about the availability of UHF spectrum. There is great potential for a range of new, innovative Mobile TV applications for which various trials have shown clear consumer demand. Having L-Band and UHF auctions in a similar timeframe will ensure the optimum outcome for both bands.

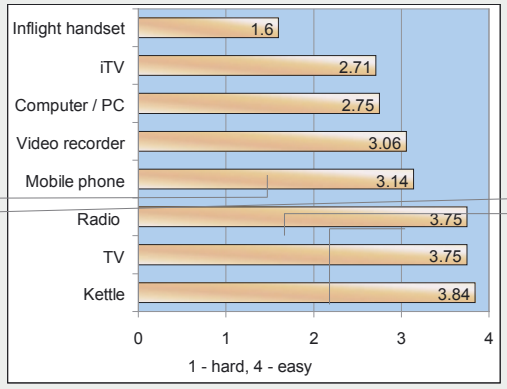
	UHF	L-Band
National networks	Can build wide area national networks	Struggle due to guard interval and propagation characteristics of L-Band
Cost of building a network in the urban or sub urban areas	Similar	Similar
Cost of building a wide area national network	Lower Cost	Higher cost due to propagation characteristics and guard interval
Spectral efficiency	With longer guard interval large area SFNs easier to construct so spectrally more efficient	With short guard interval more difficult to build wide area networks so more spectrum has to be found
Channel capacity	As 8MHz channel can carry 50% more services (18 v 12) when both frequency bands compared using QPSK	As 5MHz channel can carry fewer services
Adjacent channel issues	Existing services in the band using different network topology so network design has to be carefully thought through	Spectrum is partitioned 25MHz for terrestrial and 15MHz for satellite applications need to be planned carefully to sit adjacent channel in the terrestrial part of the spectrum
Ability to receive at 120 km/h	Similar	Similar

TILTING THE REMOTE



Daniel Stefl, Team Leader, Panasonic Europe Software Development Laboratory

Interactive television is often perceived as being difficult to use. It is considered to be almost as difficult to use as a PC[1]. However, the functionality of iTV is not as great as that of a PC and therefore should not be perceived as similar in terms of ease of use. Some of the complexity issues identified with iTV usage are: the excessive number of buttons, the need for a complex sequence of button presses, simple functions being hidden in nested menus and menu structures that are too complicated, which can be difficult to navigate [2]. This is not surprising. As a product's functionality increases, it is bound to be perceived as harder to use. The more features the system has, the more buttons the remote control needs. However, every new button contributes to an excessive number of buttons. If a button is not added to control a new feature, a new menu structure or nested menu must be added instead. Is there a solution to this closed loop?



Ease of use rating

One possibility would be a completely new concept of iTV control – for example, voice activation. The question is how much effort would be necessary to create a reliable solution for mass production and if such a concept would be viable. Another possibility, less revolutionary, but much closer to mass production reality, would be preserving the well proven remote control and augmenting its features.

The remote control is usually handheld for operation. Therefore, it is possible to track the motion of the hand by an accelerometer embedded in the remote control. The accelerometer measures the acceleration of the remote control in three axes and the measured data enables the calculation of its trajectory and other features. The advantage – for the conservative TV receivers/ consumer electronics industry – is that the remote control looks visually unchanged and all its 'traditional' features are preserved. The measured motion and tilt can be used to replace the missing pointing device (typically the mouse for the PC) for controlling the advanced GUI of iTV.

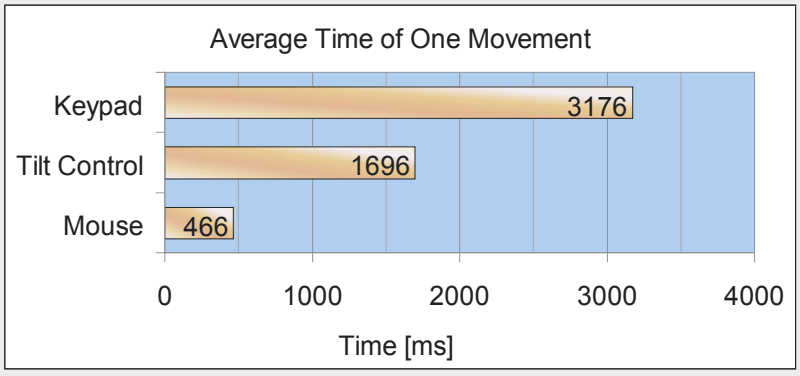
The parameters of so called MEMS (Micro Electrical Mechanical System) accelerometers available today are sufficient enough to measure the hand motion during the controlling of the TV. Due to the earth's gravitation, which is nothing more than static acceleration, it is also possible to calculate the tilt of the remote control without embedding an additional sensor. This is important because experimentation with the motion and tilt interface for iTV GUI control shows that the tilt interface performs better. iTV control based on translational motion requires moving the hand in free space similarly as when Harry Potter charms with his magic wand. It is not comfortable and the hand soon tires. A tilt based interface allows the controlling of the TV through hand manipulation, as well as moving it freely in the space. Accordingly, the tilt of the remote control can directly control visual components on the screen (e.g. scrolling) or the cursor can be moved similar to the computer mouse.

Is it comfortable to control the cursor on a screen by tilting the remote control? To find out we compared three different ways of controlling the cursor on a screen. Although moving the cursor around a screen is not a common task in the GUI of contemporary interactive receivers, it reveals the general performance of the device and provides measurable results - even if the final interaction would be based on something more than the action of point and click (e.g. direct manipulation of visual components).

A good reference for comparison is the computer mouse because of its prevalent usage. A four button narrow key keypad, a common part of TV remote controls, was used as an additional reference. The results are represented by the average time needed to complete the task of moving the cursor to a defined target (48 trials of multiple combinations of target size, distance and angle). The best times achieved were when it was easier for the participants (6 female, 6 male volunteers) to control the cursor.

As expected, the best result was achieved with the computer mouse (hand manipulated, all participants had previous experience with the mouse). The tilt control was approximately four times less favorable. However, it was still significantly better than the performance of the keypad that was tested. In addition, further investigation has shown that increasing the resolution of the tilt control improves the results achieved [3].

The tilt control enhances the performance of the remote control while keeping it visually unchanged and preserving all the original features. It could be used to create a two fold remote control with basic functionality for users that may have no interest in specific features of the receiver, but are simply interested in changing channels, volume or basic MHP applications operation while at the same time accommodating users that want more advanced television interaction and a richer set of features.



Comparison of control interfaces – the shorter time, the better performance

[1] Freeman, J. & Lessiter, J. (Dec 2001). ITC-UsE Ease of Use and Knowledge of Digital and Interactive Television: Results
[2] Freeman, J., Lessiter, J., Williams, A., Harrison, D. (Jan 2003). Easy TV 2002 Research Report
[3] Stefl, D. (Sep 2006). Use of Hand Motion for Control of Digital Television Receiver

INNOVATIVE CONCEPTS

Advanced Digital Broadcast (ADB), well known for its set-top box innovation, demonstrated a number of new technologies at this year's IBC show in Amsterdam and amongst them was its concept for a mobile television device. The unit was developed to bring together a number of open standard technologies including MHP middleware and DVB-H and DVB-T reception as a means of receiving broadcast television. Mark Goodburn, Director of Marketing for ADB discusses the market for portable television devices and the reason behind the company's desire to create such a concept product.

ADB's portable television device is the fruit of close collaboration between ADB Group's divisions and is a platform to showcase the ability of the Group as a whole in creating new and innovative products. ADB Group contains a consumer technology company, ADB S.A., two open standards middleware companies, Osmosys and Vidiom and content and applications company, Simple. The result is a concept packed full of new technology.

ADB decided some time ago to explore the requirements for emerging handheld devices seeing that the market was roughly dissected into two - portable digital video recording (DVR) and handheld reception devices. Television on-the-move presents a unique set of challenges both from the technology and applications perspective. Television is essentially a passive medium so lends itself to portability, however unlike audio, it requires visual interaction so it is not possible to carry out other tasks whilst watching – any technology or application therefore must be relatively on demand. The key to creating a successful portable product is in understanding the unique challenges that television presents in the portable world and ensuring that a product is designed to access a variety of mobile services and applications. For example, a DVR facility would allow a consumer to download content stored on a STB for playing a movie during a long journey, whilst DVB-T and DVB-H reception would allow a consumer to tune into a short five minute broadcast news update service during a short bus or train journey. ADB's goal was to create something that would offer best-of-breed and combine the ultimate convenience of a portable DVR with the flexibility of broadcast reception.

It is also important to understand that as with any television service, content creation is crucial – it would not be successful to simply take what you have on a home based broadcast television service and stream it to a mobile device – the content has to fit the application. Our sister company Simple has already started to create innovative bespoke Mobile TV content for the Italian marketplace which is an acknowledgement of the need to repurpose home centric television content.

As such, ADB's mobile television concept has been compared to the 'Swiss army knife' with many complementary technologies built into it to ensure that it can access multiple sources for content. The unit contains a dual core processor from Texas Instruments optimised for mobile applications; its low power consumption helping to maintain battery life. It was also important to provide consumers with an acceptable screen size so we selected a 7" touch-sensitive display. Digital recording is supported by a built in 60GB hard disk drive and the inclusion of a USB port ensures that content can be synchronised with a dedicated DVR or STB. We also believed that it was necessary to allow this device to interact with the Internet and other consumer electronic devices as consumers would look to source content from many different locations – providing a built in Ethernet port for wired access and more importantly providing Bluetooth and wireless connectivity through 802.11b/g standards to ensure that the unit was home networking-ready.

In terms of video, the unit is ready to receive DVB-T and DVB-H transmissions to MPEG-2 standards, but owing to the constraints of mobile spectrum, includes Advanced Video Encoding (AVC) codecs such as MPEG-4/H.264, to ensure that transmission costs are optimised. The unit also incorporates MHP allowing for the creation of additional applications including a web browser, email client and personal organiser. One of the great features that stole many peoples attention at IBC was the innovative Gravinavi navigation system. Gravinavi allows the user to navigate through an application such as an EPG by tilting the unit using a single hand – this lends itself perfectly to on-the-move applications where people are often multitasking.

It will be interesting to see how the market for mobile television develops. Many countries face spectrum availability issues and of course, with the vast array of devices that are being offered to consumers for watching television on-the-move any device manufacturer is going to face major competition. At this point in time ADB's handheld television device remains a prototype; however, the company remains positive in the outlook for Mobile TV.

"...key to creating a successful portable product is in understanding the unique challenges that television presents in the portable world..."

THE HILLS ARE ALIVE WITH DIGITAL

Karl Fischer, Technical Director, Austrian Broadcasting Services

It all started back in April 2004 in Graz, Austria's second largest city. The country conducted a four month digital terrestrial television trial that involved 150 households receiving four programmes distributed by one multiplex that included a special MHP based interactive channel called !TV4Graz. The original launch date of September 2006 was postponed until after the national elections and a new date of 26 October was set to coincide with the country's National Day, which commemorates the end of foreign occupation (in 1955).
With approximately 40 percent of the nation's households receiving the Austrian channels (ORF1, ORF2 and ATV) via analogue terrestrial broadcasting, DVB-T was always going to play an important role in the success of digital television. To facilitate the take up of the new services a public relations campaign was implemented that featured a smiling, talking, cartoon DTT ambassador to help spread the word. A website was launched extolling the benefits of DTTV along with how to receive it via a household antenna and DVB-T set-top box. A nationwide information roadshow was carried out, and ORS together with the Chamber of Commerce communicated information to the consumer electronics stores about the new DTTV service.
Earlier this year the Austrian government awarded broadcast network operator ORS a licence to launch DTT services in Austria. The goal for the government was to provide a nationwide supply of TV programmes and multimedia based services digitally in a new and future proof way with no restricted access, no monthly charges, and reaching all rural areas. ORS used 11 DVB-T transmitters for the launch of MUX A in order to reach 70 percent of the population allowing viewers to receive 3 television programme services, ORF1, ORF2 and commercial service ATV. In addition, a second regional version of ORF2 would be made available to viewers. By the end of 2008, 90 percent of the population will be covered.
Phase one in the roll out of DVB-T services saw Vienna and the provincial capitals including their surrounding areas, which represent the majority of the Austrian public, receiving the new DTTV services. By 2010, which is generally seen as the analogue switch off date, it is expected that the digital coverage will reach the existing analogue supply level of 95 percent.
Phase two will see the launch of Multiplex B in the summer of 2007. The programmes carried in MUX B will be determined in a tender where programmes that focus on Austrian related contents will be preferenced. MUX B will be offered in Vienna as well as the provincial capitals and their surroundings.
The plan for the digital roll out includes a period of time of up to seven months, after digital transmissions are available in a region, for households to continue to receive the analogue signals. This simulcasting of digital and analogue services will allow the public to purchase the necessary set-top boxes to migrate to the new services. The final changeover to DTT will start in western Austria in March 2007. Step by step, all eight provincial capitals and Vienna will be switched over. It is planned that from mid June these areas will only receive a digital signal. Information will be transmitted via the analogue signal two weeks before the final changeover in each region to remind the viewers to prepare for the switch off.
Teletext, the country's familiar and highly popular information service is also making a digital migration in the form of a new multimedia based service named MHP MultiText. Considered to be an integral featurer of Austria's new TV platform, the state-of-the-art version of teletext, is based on MHP 1.1.2.
The service offers new features such as integrated pictures and Picture-in-Picture functionality. Austria is the first country worldwide to implement this MHP version. There are also plans to offer interactive services such as voting and gaming applications in the next step. Teletext will continue to be offered next to the new MHP MultiText information service.
MHP MultiText is seen as a gateway to today's multimedia world that bridges the digital gap. Therefore, the Austrian Regulatory Authority for Broadcasting and Telecommunications (RTR-GmbH) has worked out a concept of subvention. The first 100,000 households in the supply areas that buy set-top boxes featuring MHP MultiText receive a subsidy of EUR 40 – as well as all households that are indigent. The RTR-GmbH assumes that this incentive will lead to a STB price reduction at an early stage, which makes all households benefit from the subsidy. Only STBs with a coloured test mark by TÜV Austria (Technical Supervisory Association) can be bought at the reduced price. So far 7 STBs have received the coloured test mark. They are manufactured by STRONG, HB, Schaub Lorenz, Opentel, Hirschmann and WISI.

"...MHP MultiText is considered to be an integral feature of Austria's new TV platform..."

Karl Fischer holds a degree in telecommunications engineering and electronics from the TGM institute of technology in Vienna. Fischer joined ORF in 1968 where he gained experience in broadcasting technology. As head of radio coverage planning he was responsible for ORF's frequency and coverage planning. From 1995 to 2005 Fischer was head of Broadcasting Technology at ORF. He is currently technical director at Austrian Broadcasting Services.

IT'S OK FOR AUSTRIA

Wolfgang Rittsteiger, Siemens

The 26th October 2006 marked the beginning of a new digital era for TV audiences in Austria. DVB-T offers a lot of advantages over analogue broadcasting, in particular the so called MultiText feature, where exciting applications use MHP to offer viewers numerous new possibilities. Austria is the first country in the world to use MHP version 1.1.2.

Ever since the !TV4Graz pilot project, where about 500 TV viewers were able to test the first interactive applications in 2004, ORF, ATV and Siemens have been concentrating their efforts on MHP. Over the past two years, the layout of the user interface has been further developed, editorial systems have been created, and not least, the capabilities offered by the interactive channel have been further enhanced based on lessons learned in the pilot project.

Thanks to a combination of text and images, MHP MultiText offers a wide range of information. It also offers Picture-in-Picture so the viewer does not miss any of their programme whilst surfing the MultiText content.

The EPG provides content related information including pictures, and offers a preview of the next eight days. The clearly designed graphical interface based on CEBALIST navigation (Center Based List System) and the FUSE (Flexible Unified Service Environment) concept of the ORF makes for the easy and simple use of the MHP applications. The OK button on the remote control is the central controlling element to open the way to the broadcaster's offerings.

ORF OK ... and TV becomes even more exciting

The ORF OK logo is superimposed in the top right corner of the screen during ORF programmes, so viewers know that the diverse MHP MultiText portals are available. One click on the OK button on the remote control opens the ORF OK entry portal.

Hans Hrabal, head of digital TV projects at ORF and responsible for the new ORF OK MultiText at the ORF commented, "An entirely new form of multimedia television opened up for viewers on October 26. Our offerings are like colourful TV magazines that can be enjoyed in parallel with the television programmes. Colourful images and a multitude of interactive options boost the television experience and make it even more exciting and informative."

On the ORF OK portal users can see which portals are available (news, weather and sports) at a glance along with the latest headlines. As soon as one of the portals is chosen (via a quick selection or with the cursor) it opens and displays the latest headlines. Selecting a headline then takes the viewer to the full report.

The new ORF OK MultiText offers a multitude of broadcast related multimedia features including a portal for the popular talent show 'Starmania'. ORF OK also offers Sudoku and memory games. Viewers with interactive DVB-T boxes can compete with other game enthusiasts, right from their own couches.

ATV OK ... the fast and easy way to get more information and entertainment

ATV utilises its trademark 'black dog' to alert viewers to press the OK button that clearly directs the user to enter the ATV's MHP MultiText portal.

Currently the ATV MultiText offers five main sections. One has information about ATV Highlights, everything worth knowing throughout the world of ATV, from TV programmes to its presenters, ATV events, castings and applications. 'Headlines' informs of the latest national and international news, sport happenings, economy and people. The part called 'Worth knowing' offers entertaining daily tips from the lunar calendar, the farmer's almanac, historical occurrences of the day, gossip and hearsay, fashion advice, etc.

Last but not least, ATV has got a permanently changing option created to enhance the day's main event programme. Here the viewer gets all the background information and the latest pictures of the show, the participants, etc. It is ideal for quizzes and interaction with consumers.

In the future, ATV will offer several games, and platforms for advertisers are also planned.

"ATV OK provides additional entertainment value, set up in an understandable and user friendly way. Committed Teletext users will be surprised and delighted by the simpler and faster handling of MHP MultiText. We are firmly convinced that MHP MultiText will have a greater reception than the tried and true Teletext, thanks to its contemporary presentation of additional information and its attractive layout," explains Daniela Maranda of ATV's Business Development.

SIEMENS ... interactive applications need a competent partner in the network

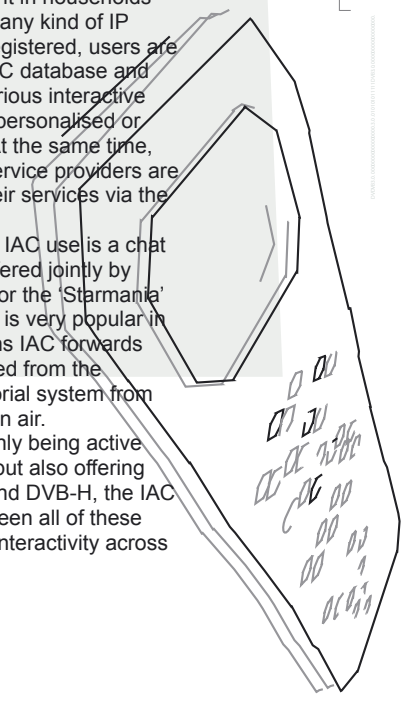
At a very early stage, when the first MHP STBs with an interactive channel became available, Siemens seized the opportunity to enter this new market by offering new applications for TV viewers. While TV is considered to be a classic lean back medium, there are still a number of aspects that make it interesting in terms of interactivity. Applications tested so far include classic voting, background information on commercials including the ordering of brochures or products, automatic programming of TV content in the music sector, and real time betting on ongoing sports events. "In order to make all of this possible, Siemens is not only programming MHP applications, but also taking care of the server environment in the network, with a view to providing an end-to-end solution," summarises Stefan Unterhuber head of the DVB integration team.

> **"...like colourful magazines that can be enjoyed in parallel with TV..."**

Using the Siemens IAC (Interactive Application Center) as the central server, it is possible to enable the various STBs present in households to communicate via any kind of IP connection. Once registered, users are recognised in the IAC database and can then use the various interactive MHP services on a personalised or anonymous basis. At the same time, broadcasters and service providers are able to configure their services via the IAC.

A recent example of IAC use is a chat application being offered jointly by Siemens and ORF for the 'Starmania' casting show, which is very popular in Austria. The Siemens IAC forwards contributions received from the audience to an editorial system from where they go live on air.

With Siemens not only being active in the field of MHP, but also offering solutions for IPTV and DVB-H, the IAC provides a link between all of these platforms, allowing interactivity across system boundaries.



ON AIR AT IBC

Eoghan O'Sullivan, DVB Project Office

At IBC 2006 in Amsterdam, the DVB Project Office wanted to make an open, unencrypted DVB-H signal available to all exhibitors to use for demonstrating their Mobile TV products. This goal was achieved with the help of two companies in particular: SIDSA, who came forward with an offer to install and operate a DVB-H platform, and National Grid Wireless, who provided the transmission components.
Four DVB-T services that were free to air for the duration of IBC were transcoded to H.264 and rebroadcast in a single DVB-H multiplex on UHF Channel 24. In fact, to maximise the number of receiver implementations that would be able to display the content, whilst ensuring the best possible picture quality would be demonstrated in each case, each service was transmitted twice, once at 12.5 frames per second, and once at 25 fps.
Throughout the exhibition halls at IBC, visitors could view the services that were being transmitted from the Tlc Tower just south of the RAI Centre at 1kW ERP. (In fact, cycling back to the hotel one of the evenings, we discovered that much of Amsterdam city centre was covered by the signal. Please note, however, that the DVB Project Office doesn't recommend cycling whilst viewing DVB-H services!)
On the DVB Pavilion at IBC, receivers

from Motorola, Siemens/BenQ and Sagem were on display, all receiving the DVB-H signal. An Electronic Service Guide, based on the DVB-IPDC specifications, was also inserted at the headend, and many of the receiver implementations also made use of this ESG to show how detailed schedule information can be delivered to the viewer. Almost every DVB-H receiver implementation at IBC was capable of picking up these broadcasts, with many also receiving other more localised DVB-H transmissions from their own and other stands.
The DVB Project Office would like to extend our thanks to our colleagues in SIDSA and National Grid Wireless for their support in mounting this demonstration. Further thanks is also due to Mier Comunicaciones (who provided gap fillers that we eventually did not need!), VolkerWessels Telecom, Nozema Services and Novec bv.
Throughout the weeks before IBC valuable feedback was also received from those designing and making DVB-H receivers, from both member and non member companies. We hope that the experience of putting together this demonstration will, in time, feed into the greater project of ensuring ever-improved interoperability for DVB-H and DVB-IPDC.

READY **STEADY GO!**

Dietrich Westerkamp, Thomson & EICTA HDTV Issue Manager

TV displays get larger and larger, and flat at the same time. On entering a television retail store the customer is overwhelmed by a huge variety of large LCD and plasma displays. Many of these can display more lines and pixels than needed for the good old PAL standard with its 576 active lines. The new generation of displays needs more pixels and lines because the growing diagonals and numbers like 720, 768, and 1080 tell the customer that the HDTV era has started – at least on the display side. But what should the customers go for now? Most are not aware of all the technical subtleties that make up the difference between a standard definition large flat screen TV and a large flat screen that can display real HDTV pictures.

In order to help the customer with his investment decision the European CE Industry Trade Association EICTA has designed the HD ready logo. This logo indicates that the display device can handle HDTV at its input and display it with the required physical resolution on the screen. The following four conditions need to be met by a device in order to carry the logo:

- At least 720 physical lines on the display;
- Capable of handling 720p/50(60), as well as, 1080i/25(30) HDTV signals;
- Digital HDMI or DVI interface, as well as analogue YPrPb input;
- Digital interface with HDCP copy protection.

This is needed because the content owners of some premium content request such a protection against illegal copying, mostly in pay TV programmes.

Obviously, there are different processing steps needed to, for example, display a 1080i/25 HDTV picture on a 768 lines progressive LCD display. The first and most difficult is de-interlacing because motion dependant processing is necessary. There are various solutions on the market, ranging from simple interpolation to very elaborate motion compensating de-interlacing algorithms. Due to the spectral overlap generated by interlaced sampling not all artefacts can be eliminated. The next step is a scaling process to meet the target resolution of the number of physical pixels available. Both steps can be implemented at different costs and consequently will result in different picture qualities. More obviously, there will be HD ready display products of different quality on the market, but they will also have different price tags.

No matter what quality the signal processing in the display device is, there is one problem the displays can never solve. The best quality display will never compensate for any coding artefacts brought into the picture on the broadcast channel. With today's CRT displays some artefacts are masked by the visible line structure of the CRT. However, this is no longer possible with a large flat panel display. The higher resolution does not give any more masking effect and the increased size makes coding artefacts more visible. Care needs to be taken in the broadcast operation.

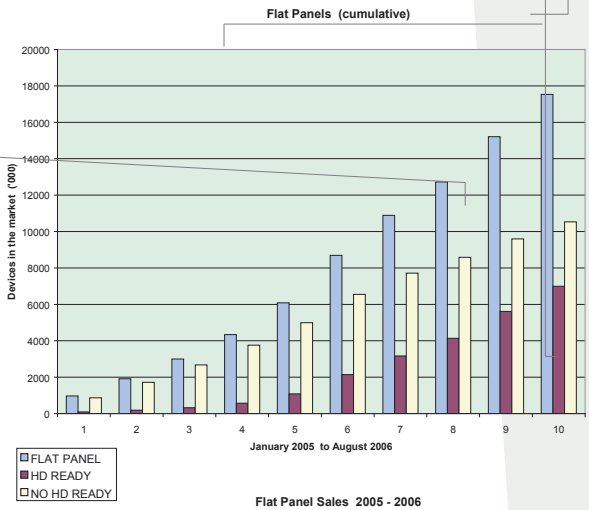
The HD ready logo was published in January 2005. At IFA 2005 in Berlin HD ready was all over the trade show, one could hardly find any large flat panel display without the logo. Today, 123 companies producing more than 190 different brands are licensed by EICTA to use the logo. At IFA 2006 several large manufacturers announced that all their flat panel displays with diagonals larger than 26" will be HD ready.

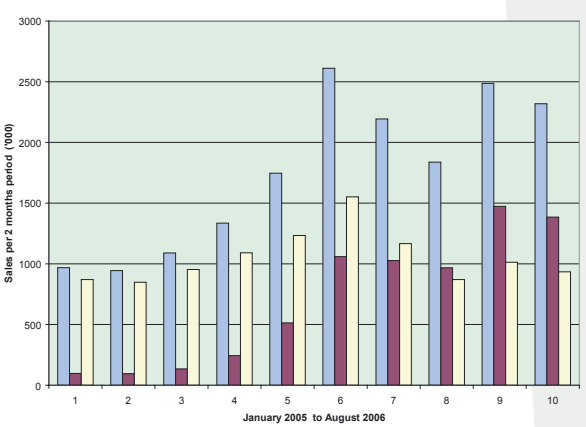
The sales figures for HD ready displays indicate success in the market place. With the first service roll outs of HDTV services - Premiere in Germany in December 2005, BSkyB in the UK in June 2006, TPS and Canal+ in France - sales have further increased to almost 700 thousand displays per month. HD ready sales are now higher in the flat panel market segment then sales of non HD ready devices.

By August 2006 the number of HD ready displays in consumer households had reached seven million. The HD ready logo is well known and people are deciding to invest for the future with HDTV receivers.

With HDTV capable large flat panel displays more and more common in consumer households, CRT based TV receivers are decreasing in sale numbers and since the beginning of 2006 more flat panels than CRT devices have been sold.

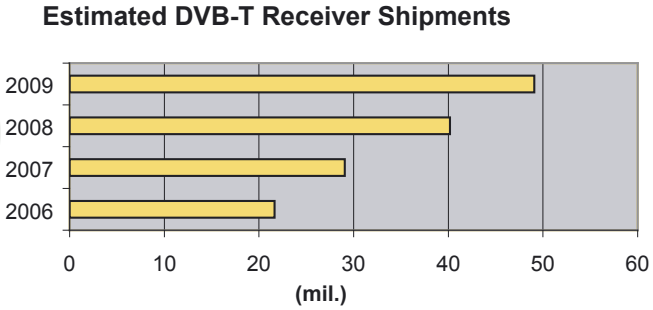
Consumers are getting HD ready, now the HDTV programmes need to follow quickly. Also, HD-DVD and Blu-Ray disc players should hit the European market soon.





Moore Analysis

BUSINESS MODELS



If you don't get to be a technological pioneer, sometimes you get to be a business innovator. This rule applies to Eastern European digital TV providers as they roll out their first DVB-T deployments.

Select Western European countries have long been the technological proving grounds for digital terrestrial TV. Eastern Europe can now build on that foundation by coupling the well established transmission standard with new, more efficient codecs and IPTV offerings that enable new business models.

DTC estimates that more than 20 million DVB-T receivers will ship in 2006 growing to nearly 50 million in 2009. In 2007 DTC forecasts that the greatest number of DVB-T receiver sales will continue to occur in the Western European countries of the U.K., France, Spain, Germany and Italy. The vast majority of those receivers will be used to view free-to-air channels – the dominant business model for DVB-T services today.

But in countries such as the Czech Republic, Estonia and Turkey where DTT services are new, or are in the planning stages, broadcasters and new service providers may offer free/pay hybrid services, HDTV programming, and/or over-the-air programming and IP-delivered programming in the same package. It may be some time before these countries generate the kind of high volume receiver sales common in Western Europe, but they can look for new revenue streams by charging for high value content such as high definition programmes. Although pay DTT business models have gone into a sound sleep after high profile failures in the U.K. and Spain, new DTT entrants are operating in a different landscape that should support some form of subscription or PPV fees.

Countries building their first DTT services have the luxury of adopting more efficient video codecs, such as MPEG-4 AVC. In countries with well established DTT infrastructures, legacy MPEG-2 programming and equipment don't afford the flexibility that can be realised in new infrastructures. And greater compression is making room for high value HD programming, which can be sold on a subscription or PPV basis. In addition, there are new players entering the TV service market by combining DTT and IPTV transmissions into a single service – usually creating a free/pay hybrid service.

This has created an environment for nontraditional TV providers to test the digital TV waters. ISPs, telcos or other providers, can distribute set-top boxes that will receive their IPTV and DVB-T signals. Whether or not traditional terrestrial broadcasters will seize these new opportunities is not yet known, but the opportunity to experiment is on the table.

Myra Moore is chief analyst for Digital Tech Consulting (DTC), a market research firm that tracks and analyses the consumer digital video marketplace. More information on the company and its research can be found at www.dtcreports.com.

NEW OPPORTUNITIES NEW STANDARDS

Delegates returning to DVB World in 2007 will notice a number of key changes over previous years. Having taken place in Jurys Hotel for the last three years, the conference now moves a little closer to Dublin city centre in the prestigious Burlington Hotel. This move will offer more space for both the conference and the exhibition, as well as more modern facilities.

Of more importance than the venue, of course, is the conference programme and here too there are changes. Rather than attempting to cover the entire scope of ongoing work in the DVB Project, the focus is rather on three key areas.

The Keynote Presentation will be delivered by Google's new Head of TV Technology, Vincent Dureau, a man with a long history of involvement in the DVB Project (pictured). The subsequent 'Flagship Presentations' are then intended to set the scene for the following days. Phil Laven of the EBU will ask 'Is there a future for open standards?'; Ma Ju of Beijing's Academy of Broadcasting Sciences will present an overview of important developments in DTT in China; and Ulrich Reimers will present a DVB timeline, pointing the way to the future work of the Project. This opening session will be completed by Ofcom's Greg Bensberg on 'Allocating the Digital Dividend' and Ken McCann with his 'State of the Union' address on the subject of HDTV.

Day 2 will open with a session titled 'Moving DVB-H Onwards'. Presentations will cover a broad range of topics, from the question of finding frequencies, to a progress report from Italy, updates from the USA and Spain, and a presentation on the launch of free-to-air Mobile TV in Japan.

That afternoon will see a session titled 'Demystifying IPTV', opening with a beginner's guide to IPTV and continuing with presentations covering DVB's standardisation work in this area, the internet video phenomenon, commercial rollouts, and interactivity in IPTV.

The conference will close on the third day with a session that looks to the future. From work on satellite services to portable devices (SSP), to advanced modulation and coding for next generation DTT, this session will be of interest to anyone keen to see where the next big growth areas will be. David Wood of the EBU will chair a closing round table discussion that will attempt to tie together all of the key issues that have arisen during the conference.

You can register now for DVB World 2007. Visit: www.dvbworld.eu

ANALYSIS:
DTT GOES EAST

DTT in Eastern Europe: markets are ready but legal framework lags.

Alexander Shulzycki, Senior Media Analyst, EBU

While some countries in Western Europe are already on the verge of analogue switchover, no Eastern European market has yet seen a full commercial launch of DTT services. This may soon change as governments and industry players move forward; however, the technology, business plans and evolution of DTT will not exactly follow the Western pattern. And analogue switchover may prove to be more problematic.

With roughly half of the forty million TV households in Eastern Europe relying on terrestrial television, the region represents a large market for free or low cost multichannel television. There are several reasons why DTT has not yet been fully introduced into this very ripe market.

Political wrangling about the regulatory framework and licensing for DTT has stalled progress and delayed implementation. Recent elections resulting in virtual draws have exacerbated the problem of finding a strong proponent to drive consensus especially among broadcasters.

Following a pattern seen in the West, commercial broadcasters have been passive and not willing to give up their analogue cash cows for digital uncertainty. Moreover, most of the region is dominated by a handful of Western media companies that have strong market share, high profits, and a shared ambivalence toward DTT.

Meanwhile, with few exceptions, public service broadcasters (PSBs) are in a weaker relative position than their Western European counterparts. A strong and enabled PSB has been the cornerstone of the most successful launches in the West.

Deliberations about the most appropriate business models are not complete. Although the free-to-air model has been the proven driver for mass adoption in the West, shortage of public funding in Eastern Europe has convinced many DTT planners that a commercially funded model may be necessary.

Finally, the Eastern countries are also faced with more technology choices and many are opting for MPEG-4 compression. This complicates the decision making process as DTT planners realise that the impact is far reaching, especially because it implies higher costs to consumers.

Yet, these bottlenecks are beginning to dissolve; here is a rundown of developments.

The Baltic Tigers

Estonia is taking the lead in the region with a full launch scheduled for the end of this year. Operated by a joint venture between transmission company Levira and cable operator Starman, the DTT platform will start on a pay basis targeting 50,000 subscribers after two years. Initial coverage will be high at almost two thirds and reach 96 percent at the end of next year. Based on MPEG-4 compression, the platform will include 18 channels with 3 to 6 free channels also available. Levira (partly owned by Télédiffusion de France) has been setting up infrastructure since 2003 and doing test transmissions since 2004.

In Lithuania, national licenses were awarded last year and a limited service using MPEG-4 video compression is already up and running. It is likely to cover 95 percent of the country by 2009.

Among the Baltic tigers, Latvia was de-clawed last year as the National Radio and Television Council stalled progress by pushing for a far greater role by the private sector and seeking to limit the involvement of the public broadcaster. The issue revolves around control of the transmission infrastructure, but if compromise is achieved Latvia could quickly advance with its neighbours.

The Big Three

Smaller and more nimble, the Baltics may achieve earlier success but DTT plans in the Czech Republic may be more fruitful in the long run. The platform will be based on the proven formula of a free-to-air model, MPEG-2 compression, and strong public service broadcaster support. So far, limited DTT services are up and running with coverage now at more than a third of the population. Public broadcaster Czech Television is simulcasting its two primary channels plus a news channel and sports channel. Even this limited offering has already attracted several tens of thousands of households to purchase STBs. With a full launch next year the country could see explosive growth. Meanwhile in neighbouring Slovakia, a four channel DTT trial operated by the Slovak Telecom subsidiary Rádiokomunikácie began in Bratislava late last year.

Poland, whose TV market is similar in size to Spain, is also getting closer to launch. In 2005 a government committee adopted a roadmap for digital switchover, however, earlier this year the DTT multiplex licensing process was delayed and allocation of licences is now expected at the end of 2006. Public broadcaster TVP is supporting the platform and is likely to launch based on MPEG-4 compression.

In Hungary a draft legal framework is in the works and trials have been operating in Budapest and Kabhegy since 2004 but disagreements between the government and the broadcast regulator persist. Currently, five channels are available to one third of the population. By some estimates, one hundred thousand DTT households may already have purchased set-top boxes. Once passed, the new broadcast law is set to pave the way for the launch of a full DTT platform in Hungary.

In summary, expect a lot of activity in this region next year starting in the Baltics. If political issues can be resolved we could also experience a real breakthrough in the larger markets. We will also see a different approach both technologically (MPEG-4) and in terms of business models (more pay channels). However, there is a real risk that higher equipment costs and a limited free offer will likely impede mass adoption and may result in insufficient penetration levels by the end of the decade. But first things first: little can happen until full launch strategies are implemented.

"...DTT plans in the Czech Republic may be more fruitful in the long run. The platform will be based on the proven formula of a free-to-air model, MPEG-2 compression, and strong public service broadcaster support."

UBS DVE-6000

UBS has released the latest upgrade of its DVB-H IP Encapsulator DVE-6000. The IPE is fully DVB-H compliant and compatible with all available receivers on the market. The product supports Dynamic Time Slicing technology for unprecedented bandwidth utilisation and network efficiency, internal SI/PSI table editor, parser, compiler and generator, and internal SFN adaptor. www.uniquesys.com

The new **Advantech** SatNet Series 5000 DVB-RCS VSAT Terminal is a slim, rack mountable unit that offers connectivity for corporate LAN with return link rates up to 8Mbps. The 'always-on' SatNet Series 5000 achieves optimal bandwidth use thanks to its DVB-S2 capability. It is available with two premium options: dual DVB-SCPC/DVB-RCS capability for Pay-as-You-Grow solutions, and new Mesh feature allowing DVB-RCS terminals to communicate directly with each other through the satellite transponder. Thanks to its high power internal supply, it provides inline power to Block Up Converters up to 4W without any add on equipment. www.advantech.ca

Advantech SatNet Series 5000

Conexant Systems' CX2417X family of HDTV set-top box broadcast decoders has been certified to support Dolby Digital Plus. This technology allows satellite, cable and terrestrial broadcast operators to significantly improve bandwidth utilisation and deliver additional, higher quality audio programming using their existing infrastructure.
The CX2417X decoder family includes all of the major elements required to implement the core system and decoder electronics of high performance personal video recorder-enabled HDTV STBs deployed in digital satellite, cable, terrestrial or IPTV networks. www.conexant.com

Enensys Technologies has introduced several new products. The IP-eASI is a MPEG over IP to DVB-ASI interface for creating a cost effective primary distribution scheme by sharing an IP link between sites. The DVB-H mini transmitter with IP input accepts MPEG over IP distribution signals and provides a DVB-H compliant broadcast with 1 Watt (30 dBm) output power. And, DiviCatch RF-C a USB 2.0 based digital cable analyzer for performing real time RF measurements and MPEG TS analysis, capture and MPEG streaming over IP. www.enensys.com

Enensys DiviCatch RF-C Digital Cable Analyzer

Scientific Atlanta's latest release of DCM adds support for DVB Simulcrypt compliant scrambling and digital programme insertion on MPEG-2 SD and HD streams. With DCM, operators can manage digital services, processing up to 1680 streams; deliver more programmes over less bandwidth with best-in-class video quality; generate new revenue with ad insertion opportunities; and depend on the DCM's DVB SimulCrypt compliant platform to secure content. www.saeurope.com/dcm

BigBand's GNA module, designed for its BMR platform, is the platform's primary engine for high density IP transport de-jittering. The module provides operators with complete control over the quality and bandwidth use of each SD and HD programme; allows the bit rates of programmes to be converted to fixed values for deterministic transport across networks; and digital programme and zoned ad insertion. www.bigbandnet.com

BigBand's GNA module

Newtec's SkyShaper is a compact DVB-S2 solution to establish an adaptive transmission between an SNG van and a broadcast centre where the television material is used or recorded. Adaptive and Coding Mode functionality allows the transmission to be operated with a minimum rain margin and therefore ensures that the maximum data rate is available, and that the link is never interrupted by rain or snow conditions. www.newtec.eu

The **Tektronix** Spectra2|VQM v2.0 is an integrated, multi-user video media quality, signalling and control protocol analyzer to help bring triple play and IPTV services to market. It leverages the Spectra2 VoIP and converged voice networks testing platform to deliver IP video and network quality metrics, such as presence, accuracy and delivery. www.tek.com/video

DTS and its technology partners, **Coding Technology** and Linear Acoustic, are offering an advanced, high quality, high efficiency, end-to-end solution for multichannel audio for HDTV broadcasts. A transcoding technique enables aacPlus-encoded 5.1 channel audio, transmitted at a rate of 160 kbps, to be transparently converted in a set-top box to DTS Digital Surround. It provides previously unattainable efficiencies in the delivery of high quality surround sound broadcasts. www.dtstech.com & www.codingtechnologies.com

Radyne now offers ACM and VCM versions in its DM240XR family of high speed DVB modulators that meet the exacting standards of high data rate video, Internet and fiber restoral satellite applications. The modulators perform at data rates of up to 250Mbps and are DVB-S and DVB-S2 compliant. Models can be purchased with a minimal configuration and are available with Pro-MPEG Gigabit Ethernet interface for reliable MPEG over IP. www.radynecomstream.com

Radyne DM240XR

Neotion's new Core Module is a plug-n-play motherboard that enables MPEG-4 and IP hybrid capabilities that facilitates network delivered entertainment, personalised television, and advanced conditional access layers certifications. The all in one add on card enables seamless integration, unrivalled time to market and cost savings for tackling new opportunities with secured digital receivers employed in a digital home environment. www.neotion.com

Pace Micro Technology has launched the TDx850 HD PVR for satellite and cable customers. The TDx850 comes with H.264 decoding and triple tuners, as well as Dolby Digital Plus for the ultimate HD experience. Together with a 250Gb hard drive, the TDx850 enables operators to offer a dedicated push-VOD service with an enhanced EPG. www.pacemicro.com

Pace TDx850

Strategy & Technology has introduced TSBroadcaster 2, an integrated software product that allows a broadcaster or network operator to configure and automatically generate MPEG-2 transport streams containing DSM-CC object carousels compliant with the latest versions of MHEG, MHP, OCAP and ETV standards. It provides broadcasters with continuous control of application insertion and playout, data updates and stream event generation. www.s-and-t.com

Rohde & Schwarz offers a new option that allows broadcasting network operators to monitor single frequency network functionality with its R&S ETX-T DTV monitoring receiver. The R&S ETX-K10 option helps to prevent transmission failures by monitoring the compliance of specific requirements and signals possible malfunctions at an early stage. www.rohde-schwarz.com

R&S ETX-T DTV Monitoring Receiver

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