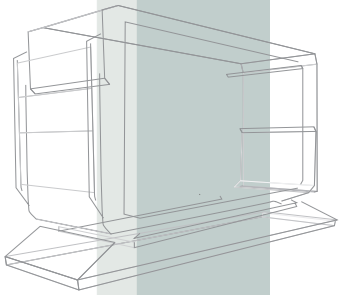
Edition No.23 **September 2007**

DVB-SCENE

Tune in to Digital Convergence



23

DVB SH

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READY FOR LIFT OFF

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The Standard for the Digital World

This issue's highlights

> DVB-T2 - Facts & Fiction
> DVB-SH Update
> Mobile TV in Italy
> DVB-H Comparison
> Interactivity for Mobile TV
> Market Watch

DVB-SH

PRODUCT LINEUP

Success with UBS

DVB-SH IP Encapsulator



The DVB-SH model adds the additional SHIP synchronization packets for DVB-SH compliance.

The UBportIPE DVB-SH IP Encapsulator incorporates the same class leading architecture of the UBportIPE DVB-H model with features such as:

- *Dynamic Time Slicing for highly efficient bandwidth utilization*
- *Internal SI/PSI table editor, parser, compiler and generator (UBS SI/PSI TDL)*
- *Internal SFN adapter*
- *Internal stream recorder and player*
- *Remote setup and monitoring through WEB GUI or SNMP*
- *Compact, reliable, solid state design. No moving parts.*

DVB-SH Modulator



The UBwaveDVB-SH modulator is a fully DVB-SH compliant modulator with all of the required timing and modulation modes for DVB-SH head end and repeater sites.

- *OFDM and TMD modulation modes available*
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- *Built in test signal generator*
- *Remote setup and monitoring through WEB GUI or SNMP*

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REAL INNOVATION

A word from the DVB Project Office



Peter MacAvock, Executive Director

Summertime in Europe is often a time of rest, when you get a chance to do the jobs in the office that you don't have time to do at other times. For some reason this summer DVB has been more active than ever. Those implementing DVB-H are working full time to deploy networks and services. DVB's S-band alternative is nearing implementation with extensive demonstrations taking place in different markets - most notably in the US. Italy and Asia continue to be the big DVB-H markets with important lessons being learnt on market expectations which will be of use when others come to launch. One of the most exciting work items in DVB at the moment is the DVB-T2 development work. The results of the Call for Technology are in and the work has begun analysing the results to determine how these might fit with the Commercial Requirements. One thing is sure, there is real innovation going on in this activity and we're expecting as innovative a technology as DVB-T was some 12 years ago.

NEW MEMBERS

Asociación de Investigación y Cooperación Industrial de Andalucía (AICIA) - Nonprofit association that encourages, guides, and promotes industrial research in Spain. www.aicia.es
Brunel University - The School of Engineering and Design is one of the largest and most successful engineering and design schools in the UK. www.brunel.ac.uk
Central Research Academy of SVA Group Co.,Ltd - Electronics and information technology company. www.sva.com.cn
Hitachi Europe Ltd. - A leading global electronics company. www.hitachi-eu.com
Hughes Network Systems Ltd - Designs and provides broadband satellite networks and services. www.hns.com
NXP Semiconductors - Independent semiconductor company founded by Philips. www.nxp.com
Shenzhen State Micro Technology Co., Ltd. (SMiT) - Company specialising in the development and sales of digital TV products with proprietary intellectual property rights and core technologies. www.smit.com.cn
Temex Sync – Provider of time and frequency synchronisation solutions for European broadcast transmitters' manufacturers and broadcast operators. www.temex.com
UniSoft Corporation – Provides broadcast, development and testing tools for MHP and OCAP. www.unisoft.com

NEW STANDARDS

TS 101 154 V1.8.1 (August 2007): "Implementation guidelines for the use of MPEG-2 Systems, Video and Audio in satellite, cable and terrestrial broadcasting applications"
TS 102 005 V1.3.1 (August 2007): "Specification for the use of Video and Audio Coding in DVB services delivered directly over IP protocols"

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UNINTERRUPTED SERVICE

DVB-T2 - Facts & Fiction

Ed Wilson, European Broadcasting Union,
Project manager of DigiTAG and Secretary to the Commercial Module

In April the DVB Steering Board formally approved the publication of the Commercial Requirements for DVB-T2, as captured by the Commercial Module's Advanced Modulation for Terrestrial sub-group. The Technical Module took these requirements and annexed them to its formal Call for Technologies for DVB-T2, which was addressed without restriction to any DVB or non-DVB member companies who felt they had some technology to offer. In total 31 proposals for technology from 21 companies were submitted to the Project Office by the closing date in June.

The complicated process of sifting through these proposals to find the combination which has the potential to meet best the Commercial Requirements has now begun in earnest.

But with the publication of the Commercial Requirements came voices from countries which are close to launching DVB-T services, and those which have yet to choose their preferred terrestrial broadcasting technology: "Is there something wrong with DVB-T?", we heard, and, "Do I need to wait for DVB-T2 to be able to deliver HDTV?". Well, of course, the answer to both questions is a resounding NO! All over the world DVB-T has proved itself as a brilliantly successful method of broadcasting digital terrestrial TV and can be seen supporting MPEG-2 high definition TV in Australia and soon MPEG-4 high definition TV in France and Singapore.

To look for a moment at the United Kingdom, the first European market to roll-out terrestrial DVB-T services, the latest research figures published by the government's broadcasting and telecommunications regulator Ofcom show that with over 80 percent of homes now converted to digital reception, close to 19 million DVB-T devices have been sold. One third of homes rely upon DVB-T for their primary TV set, and the other devices are used with the second and third sets in kitchens and bedrooms. Such a buoyant mass market is a direct result of the economies of scale which have been achieved in highly sophisticated consumer products, and this applies also to professional equipment for the transmitter network. Selecting DVB-T for new services to launch over the next several years is an obvious way of removing financial risk from the business plan.

So what exactly is DVB-T2 going to offer that DVB-T does not? Well it should not be surprising to anyone, 12 or more years after the definition of the original Commercial Requirements, that we can look back in 2007 with '20-20 hindsight' and exploit recent advances in semi-conductor and digital signal processing technology.

"...we can look back in 2007 with '20-20 hindsight' and exploit recent advances in semi-conductor and digital signal processing technology."

In fact, what is surprising is just what has been achieved by DVB-T over the years. For instance, who would have predicted that hundreds of thousands of Mercedes-Benz and BMW vehicles are factory fitted with full-diversity DVB-T in-car TVs? At the other end of the scale, some of us saw a prototype standard definition plasma display panel with its large rack of associated electronics at Montreux in 1991, but we heard no one predicting the present 'must-have' popularity of large flat screen HD-Ready IDTVs in the consumer market.

In defining the Commercial Requirements for DVB-T2 we have focused on market pressure for ever increasing payload capacity over the digital multiplex. This is driven by interest in both multichannel standard definition TV and new high definition TV services linked with the high market uptake of HD-Ready flat screen TVs. The number of these sold in Western Europe is already around 24 million units and this is predicted to more than quadruple to 115 million* by 2010. Broadcasters are gradually gearing up to produce more and more programming in HDTV, and DVB-T2 aims to be an efficient way of delivering this attractive material to every home.

The principal Commercial Requirement is for DVB-T2 to offer at least 30 percent more payload capacity than DVB-T under similar reception circumstances. The main application for DVB-T2 will be to allow broadcasters to launch new terrestrial broadcasts, alongside existing DVB-T services, whilst benefiting from increased capacity of the DVB-T2 system. The DVB-T2 System is designed from the outset to be received by existing domestic DVB-T antenna systems and to coexist with existing DVB-T transmissions.

The products and services using DVB-T2 are intended to be commercialised from 2009, but with a particular sweet spot of opportunity from 2012 when 'Analogue Switch-Off' is planned to be completed in much of Western Europe. A typical scenario could be the launch of high definition TV services over DVB-T2 on new frequency allotments alongside existing standard definition TV services using DVB-T, after analogue broadcasts end.

So good luck to DVB-T2, but please don't interrupt your plans for DVB-T services!

*Source: Understanding & Solutions

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HYBRID ENTERPRISE

Philip Kelley, Alcatel-Lucent

DVB-SH is the name of the latest mobile broadcast standard designed to deliver video, audio and data services to small handheld devices such as mobile telephones, and to vehicle-mounted devices. The key feature of DVB-SH is the fact that it is a hybrid satellite/terrestrial system that will allow the use of a satellite to achieve coverage of large regions or even a whole country. In areas where direct reception of the satellite signal is impaired, and for indoor reception, terrestrial repeaters are used to improve service availability. DVB-SH has been introduced to DVB-SCENE readers in a March 2007 article by Prof. Dr-Ing. Ulrich Reimers, entitled “A New Star in the Sky”. Since its publication as a DVB Bluebook in February 2007, the new standard has gained significant momentum, demonstrating both technical robustness and fitness to enter the regulatory scene. And it has been sent to ETSI for publication as formal standards EN 302 583 and TS 102 585.

Combining the best of satellite and terrestrial technologies, DVB-SH seeks to exploit higher frequencies such as S-band, where there are opportunities for Mobile Satellite Services (MSS) systems, operating in conjunction with Complementary Ground Components (CGC). DVB-SH also leverages on the experience gained in 3G networks while delivering video streams in cellular terrestrial networks operating in the 1.9 to 2.17 GHz UMTS band, which is adjacent to the S-band. This experience is particularly useful when planning the deployment of repeaters for good indoor coverage. Additionally, significant savings in deployment costs are expected wherever cellular site reuse, including 3G antennas, is possible. Furthermore, the DVB-SH set of specifications allows the development of products and services for user terminals that can be easily operated in dual mode with other DVB-based similar services. In particular, leveraging on early deployments of DVB-H systems, DVB-SH allows the extension of the present UHF-based service offer to S-Band with a common cross border allocation, a reduced total network infrastructure cost and an expansion of the offer in terms of number of channels/services. Since the overlapping use of the DVB-IPDC specifications ensures that the two systems will be fully compatible, seamless IP Datacast (IPDC) services will be offered, such as Electronic Programme Guides, Content Delivery Protocols and Service Purchase and Protection.

In February 2007 the European Commission confirmed that 30 MHz of S-Band spectrum could be used for mobile satellite services and that complementary ground components of a hybrid satellite/terrestrial system are also permitted. This clears the way for those companies with access to suitably equipped satellites to launch services in the coming years. As early as October 2006, Eutelsat had announced the decision to include an S-Band payload on the W2A satellite to deliver DVB-SH services over France, Germany, Italy, Poland, Spain or the UK, creating on the occasion a joint venture with SES Astra dedicated to the commercialisation and operation of this S-Band capacity. In May 2007, ICO Global Communications Limited announced the selection of DVB-SH for the mobile video component of its Mobile Interactive Media services deployment of an Ancillary Terrestrial Component. This operator is planning an alpha trial in the US for spring 2008 with Alcatel-Lucent and Hughes Network Services (*see page 8*). A number of manufacturers have already announced their intention to support the market both with head-end equipment, chipsets and terminals by the end of 2007.

DVB-SH also is the cornerstone of the Unlimited Mobile TV project lead by Alcatel-Lucent with other innovative companies and supported by the Agency for Industrial Innovation (AII). EU approval of the public financial support was granted by the European Commission in April this year.

> “...allows the development of products and services for user terminals that can be easily operated in dual mode with other DVB-based similar services.”



Philip Kelley is Director, Mobile TV Standardisation for Alcatel-Lucent’s Convergence Business Group. Philip has over 20 years of experience in Telecommunications and Information Systems, including positions in marketing and business management within Alcatel, Thomson, McDonnell Douglas and Alstom. He is Secretary General of the French ‘Forum de la Télévision Mobile’, and Chairman of the DVB work group which is currently standardising Satellite Services to Handheld devices (DVB-SH).



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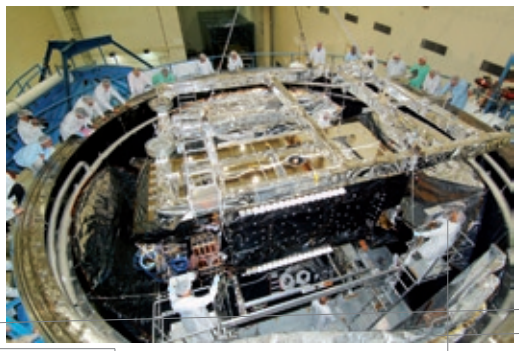
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ALPHA TRIAL



The satellite communications company ICO Global Communications (Holdings) has announced the alpha trial of Mobile Interactive Media (MIM) services in the U.S, set for spring 2008.
ICO MIM is a converged mobile media service which addresses a wide variety of consumers' entertainment and communication needs, based upon ICO's next generation geostationary satellite and the deployment of an Ancillary Terrestrial Component (ATC). ICO MIM will provide multiple channels of high-quality mobile video to large-screen user devices. Alcatel-Lucent has been chosen to supply the system architecture and design based on the mobile multimedia DVB-SH open standard. The company has also been contracted to be the end-to-end network integrator for both the satellite and terrestrial networks and to provide corresponding installation and network integration services.
ICO MIM will provide full-duplex, IP data communication services between customer devices and ICO satellite base station equipment using Hughes Network Systems' ETSI standard GMR air interface technology, with Internet access, VoIP, and other data applications. In addition, Hughes will develop an integrated satellite terminal and antenna system to incorporate GMR and DVB-SH technologies, as well as a GPS receiver.
Tim Bryan, ICO's CEO commented, "ICO MIM lies at the intersection of three highly prized consumer services: interactive location-based services, using GPS with GMR for navigation plus live traffic, weather and social networks; emergency calling and messaging, for times and places when the traditional terrestrial networks are unavailable; and mobile video, on larger screens and with better quality than currently available. We plan an alpha trial on ICO MIM for the spring of 2008, including the deployment of a terrestrial network in two cities, to demonstrate the attractiveness of ICO's assets being deployed for these services."
"We consider hybrid satellite/terrestrial networks very powerful solutions for providing mobile broadcast services to consumers. Moreover, by leveraging the large ecosystem of the DVB-H open standard family, we believe that DVB-SH will enable a broadband range of mass market multimedia applications," stated Olivier Coste, President of Alcatel-Lucent's Mobile Broadcast activities.
Matthew Mohebbi, vice president and general manager of the Mobile Satellite business unit at Hughes added, "GMR is a proven, high performance open air interface, optimised to operate over satellite. We are proud to have been selected to deliver GMR base stations for the ICO alpha trial, as well as terminals that combine DVB-SH and GMR technologies that can offer consumers mobile integrated communications and entertainment."



ITALIAN STYLE

Vincenzo Novari, CEO 3 Italia



10 a.m., June 5, 2006, is a date for historians to highlight when writing about the evolution of the TV industry. For more than 50 years TV has been a loyal companion to Italians, however, a new era was ushered in when 3 Italia launched the world's first commercial DVB-H digital mobile TV service. Initially with nine channels (Rai1, Rai2, Mediaset, the in house produced La3 Live and LA3 Sport, Sky Sport, Sky Cinema, Sky Vivo, Sky Tg24) the service has now increased to twelve. In November 2004, 3 Italia was receiving 20 percent of its data revenues from UMTS mobile TV. Many customers were watching ten minutes of mobile TV daily even though there were only a few channels and the quality on offer could be considered as 'best effort' with a price that was quite high. However it confirmed that there was a market out there. Then news arrived of an emerging technology called DVB-H, able to solve the main issues of 'UMTS powered' mobile TV, and providing DVD-like quality, many

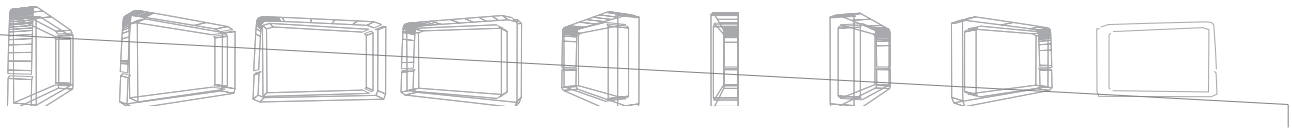
VIDEO BLOGGING

Alessandro Floris, Mobile TV Director 3 Italia



During the FIFA World Cup 3 Italia introduced interactive programming where viewers could send live SMS messages via their mobile TV phone to La3 Sport and La3 Live commenting live on the programmes and interacting with the presenters. It soon became apparent that a very appealing idea, both for the consumers and the mobile TV operator, was around the corner with User Generated Content (UGC) and in general - 'Video Blogging'.
All 64 matches in the 2006 World Soccer Championship were broadcast live on digital mobile TV and included the first UGC DVB-H service. Soccer fans could send videos, pictures and SMS messages to 3 Italia which were then broadcast during "Il Mondiale in Tasca", a live TV programme dedicated to the World Championship.
For 3 Italia, UGC was not exactly new. At the end of 2004, when the concept was almost unknown, the company launched on its InVideo mobile portal the first mobile UGC service. So instead of building a business model on advertising, a revenue sharing model was chosen. Each time a user pays to download a video, the company pays a percentage of that revenue to the user who uploaded that video. In less than 3 years, more than 120 thousand videos have been uploaded, with more than 8.2 million downloads and half a million euros paid out.
With the launch of the programme Tifosi 2.0 (Italian for a group of fans), aimed at soccer supporters, 3 Italia is building on its belief that the role of the consumer content maker is one of the main features for mobile TV. The soccer community was 'mobilised' into creating content for La3 Sport and Tifosi 2.0. TV made by viewers for viewers.
Unlike the Internet which is a 'box' in which you can put almost everything, with TV you have to be more selective. 3 Italia carries a cherry picking exercise before broadcasting to ensure that only the best UGC clips are used to produce the programme. 3 Italia believes in a Television 2.0, where UGC and classic content co-exist and are distributed via an increasing number of platforms creating a new social media with traditional broadcasting, UGC and interactivity.
New technology , i.e. videophones and TV phones - has made it easier to capture and distribute imagery and videos, leading to a citizens' journalism that is increasingly relevant to the news cycle. This new genre will never replace the award-winning photo and video journalism, but it is a highly complementary offering. It is clear that UGC is playing a valuable role in today's communication landscape. By implementing rigorous quality standards, digital mobile TV can deliver powerful images and videos captured from a unique perspective while ensuring journalistic integrity.

"User Generated Content is playing a valuable role in today's communication landscape."



more channels and at an affordable price. 3 Italia decided to enter the field and after acquiring a national digital TV operator's license created its own DVB-H network within record time. 3 Italia consolidated its position in mobile digital broadcasting by introducing and launching a service created by television professionals.
Following a successful trial in March 2006, 3 Italia launched its history-making digital mobile TV service. From that moment on TV officially left the home and became mobile.
The digital mobile TV service is offered as part of an all inclusive deal that combines a pay TV subscription model with a daily bundle of voice and mobile Internet. There is also a pay-per-view model that offers TV on contracts from one day to three months.
From the beginning, 3 Italia had a pay TV model approach with advertising on its mobile TV channels - the in house produced La3 Sport and La3 Live. Early advertisers included companies such as Puma, Nike, Mercedes, Renault, Mastercard, L'Oreal and Sisal (the main Italian betting agency). A strong point of mobile TV advertising is the unique audience measurement tool which gives the opportunity to track in real-time the main usage data on each mobile channel. While traditional TV audience measurement is done on a sample, 3 Italia's accuracy allows advertisers to hit their targets.
One of the first findings from the audience research tool has been that digital mobile TV viewing has new peak times, different from fixed TV. The majority of the customers uses mobile TV during lunch breaks and while commuting. Moreover, digital mobile TV expands the audience by gaining viewers who wouldn't necessarily be able to watch fixed TV but can use the TV phone wherever and whenever they want.
With the boost of the World Cup in July 2007, 3 Italia gathered 100,000 customers before the end of the month-long competition, no doubt helped by the victory of the Italian national team.
No new technology has had the same ramp-up in the Italian market, not GSM, or UMTS. But above all the launch worked in terms of value creation: DVB-H mobile TV customers are worth 60 percent more than the market average. There are now over 600,000 customers, and new TV phones are being launched exclusively for the Italian market - the Pocket TV, the first DVB-H 'personal TV' (pictured left). A media analyst once said "The idea of watching TV on the move is like having sex outdoors - exciting, but not always possible". It was only 15 years ago that some analysts were saying that nobody would have the need to make a phone call on the move. Today, in its first phase and having made a soft landing, we have a mobile TV service that is aimed at primarily educating the market and which can become the research workplace to test new formats, new business models, fully maximizing the characteristic of being 'always with you' which differentiates the mobile phone from the fixed line phone.

SQUARING OFF

DVB-H and FLO – a performance comparison

Khaled Daoud, Institute for Communications Technology, Braunschweig Technical University

DVB-H and FLO (Forward Link Only, the system developed by QUALCOMM) are two mobile broadcast solutions the commercial deployment of which, in different countries, has just begun. DVB-H mobile TV services have been launched in Italy (June 2006), Finland, Vietnam and India, with more to follow this year, whilst FLO has been operational in parts of the USA since last March. FLO and DVB-H feature many similarities. They can be used in 5, 6, 7 and 8 MHz channels and target mainly the VHF and UHF bands. DVB-H has the special feature of being backwards-compatible with DVB-T. DVB-H specifies three possible OFDM modes and four different guard interval lengths (GI) whereas FLO specifies only one OFDM mode with one guard interval length. These parameters have a significant influence on broadcast network planning affecting, for example, the maximum possible distance between the transmitters in a Single Frequency Network (SFN). In addition they affect the highest achievable reception speed. Considering this, DVB-H offers more flexibility and in consequence the possibility to be adapted to the topography of the regions to be covered and to the business plans of the operators.
For the aim of power consumption reduction both systems make use of time slicing technology. The slice spacing in DVB-H amounts to a typical value between 1 and 4 seconds. In FLO this duration is fixed to 250 ms. Time slicing leads to high power reduction ratios compared to continuous data transmission. However the receiver synchronisation time has a negative influence on power reduction, an influence that is more considerable for lower slice spacing.
We have carried out simulations of FLO, the DVB-H 4K mode with GI 1/8, and the DVB-H 2K mode with GI 1/4. The simulations were carried out in 8 MHz mobile COST 207 TU-6 channels, using 16 QAM modulation, an MPE-FEC and an outer code rate of ¾ for DVB-H and FLO respectively, and an inner code rate of ½. The three modes considered have similar features in terms of bandwidth efficiency and SFN transmitter distances, an important factor in determining the network construction costs. The channel estimation for mobile channels was conducted using one-dimensional Wiener filters in the time and frequency domains, which were conceived for a rectangular Doppler spectrum and a rectangular delay power spectrum respectively. The required signal to noise ratio (SNR) values for a packet error rate of 2.5 percent, which is quite reasonable for acceptable video quality, were determined for different Doppler frequencies. The results are shown in Figure 1.

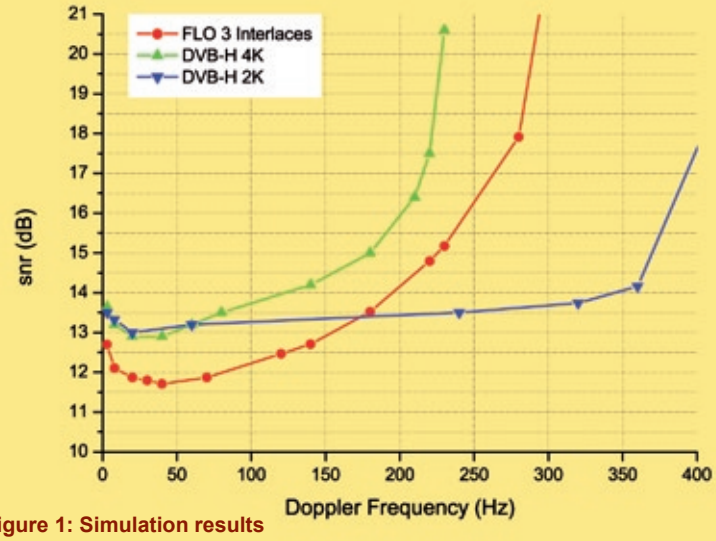


Figure 1: Simulation results

> **"FLO features a lower subcarrier spacing than both DVB-H modes, which makes it more susceptible to Interchannel Interference..."**

Comparing FLO to the DVB-H 2K mode we find that for the Doppler frequency range below 175 Hz, which corresponds to a device velocity of 270 km/h at 700 MHz carrier frequency, FLO requires between 1 and 1.5 dB less SNR than DVB-H 2K depending on the Doppler frequency considered. This performance difference reduces as the Doppler frequencies approach 175 Hz, the frequency at which both systems feature the same SNR requirement. Beyond 175 Hz the DVB-H 2K mode performs significantly better than FLO and reaches clearly higher Doppler frequencies. When we compare FLO to the DVB-H 4K mode we find that FLO requires between 1 and 1.5 dB less SNR for Doppler frequencies below 175 Hz and that FLO reaches higher Doppler frequencies than the DVB-H 4K mode.
FLO features a lower subcarrier spacing than both DVB-H modes, which makes it more susceptible to Interchannel Interference (ICI) caused by high velocities of the device. This explains the fact that DVB-H 2K reaches higher Doppler frequencies than FLO. However, in spite of its lower subcarrier spacing, FLO allows for higher Doppler frequencies than DVB-H 4K mode. This is due to its more dense pilot structure which allows for a slightly better channel interpolation in the time direction during channel estimation and compensates for the lower subcarrier spacing.
The simulation results show that where FLO has a better performance it can be typically ascribed to the use of turbo inner coding. In DVB-H convolutional inner encoding had to be used in order to ensure backward compatibility to DVB-T, enabling herewith the transmission of DVB-H and DVB-T services in the same multiplex.

Khaled Daoud received a Dipl.-Ing. degree from the Braunschweig Technical University (Germany) in 2003. He is a research associate at the Institute for Communications Technology at Braunschweig. His research interests focus on the comparison of the different current mobile broadcast technologies.



INTERACTIVE MOBILE TV

Since the launch of the first mobile TV services, operators and broadcasters have turned to interactive services to enhance the TV offering and improve the business case with new revenue streams through premium services. Java based interactivity aims to speed up the user acceptance in mobile TV. Markku Koponen, Vice President, Sales, Axel Technologies reports.

Most of the mobile operators already offering streaming video services through 3G networks are developing strategies for transitioning into mobile broadcast technologies, such as DVB-H. One of the key challenges is the provision of easy access and control of the services, without the need for the end user to know which application and network to use (3G or DVB-H). To simplify customer communication and speed up user acceptance, a key criteria for operators and broadcasters alike, is the provision of a uniform user interface for all mobile TV services, across different technologies, makes and models of handsets. Scalability and flexibility of applications will also be required as in addition to mobile phones, end users will use other mobile devices such as portable media players and PDAs to access mobile TV services.

To answer these challenges, the key players in the mobile TV development, including Sun, mobile phone manufacturers Nokia, Ericsson and Motorola, and operators Vodafone and Orange have joined forces to develop a future standard for interactive mobile TV, called JSR 272.

JSR 272 is a mobile broadcast service API for handheld terminals which aims to define a common Java interface to access and control digital broadcast content from mobile devices. JSR 272 interfaces with the mobile TV terminal's middleware software and enables Java applications to control access on digital channels, search and discover services, switch between channels, receive and consume services, and purchase and subscribe to services.

APIs will enable rich functionalities similar to the digital TV set-top boxes consumers are using in their homes. Users will be able to record and interact with the programmes, vote for their idols, see the latest sports statistics, shop, and access location-based services. Applications using these functionalities may be downloaded over the broadcast or the interactive channels. For example, a music show may include a software application to purchase ring tones or songs.

For application developers, APIs offer an efficient way to build value added services to mobile TV. They enable communication between Java applications and the mobile TV receiver and middleware software by abstracting out the transport layer, therefore giving high level access to digital broadcasts. APIs also enable applications to take advantage of various mobile broadcast technologies. Therefore, the same application should work across different handsets and technologies supporting JSR 272 capable middleware, increasing the market potential for application developers.

The mobile value added services already developed demonstrate that applications implemented with Java can be highly graphical, with animations, pictures and colours, and scalable – supporting various screen sizes and different terminals. Also, implementing new Java applications on mobile TV will be fast, reliable and cost efficient.

The final specifications for JSR 272 will be completed in August 2007 after which fully compliant products can be implemented.

Axel Technologies has implemented its own Java to native interface, similar to JSR 272, for its DVB-H middleware product. To demonstrate and test the new functionalities enabled by the middleware's Java interface, Axel Technologies has also developed an application, mobile TV electronic service guide (ESG) using the interface.

The functionalities were tested with DVB-H and 3G services, terminals and networks first at a DVB-H field test network in Turku, Finland shared between Nokia, Axel Technologies and local universities, and later at the commercial DVB-H network in Finland.

"...applications implemented with Java can be highly graphical, with animations, pictures and colours..."

At 3GSM 2007 in Barcelona and at CommunicAsia 2007 in Singapore, the interoperability of the ESG and the DVB-H Middleware was also demonstrated. In the demonstrations the same ESG was used to access and control both 3G and DVB-H mobile TV services, therefore giving end users uniform access to all Mobile TV services.

The initial test results and feedback are encouraging; using familiar (e.g. tailored and/or branded by local operator or broadcaster) feature-rich content increases customer satisfaction and also usage of mobile TV services.

Finally, for the success of mobile TV the single key issue will be the user experience, how smoothly they can access services, switch channels, search and purchase content, and the applications. JSR 272 will be a big step to improving the user experience in mobile TV.

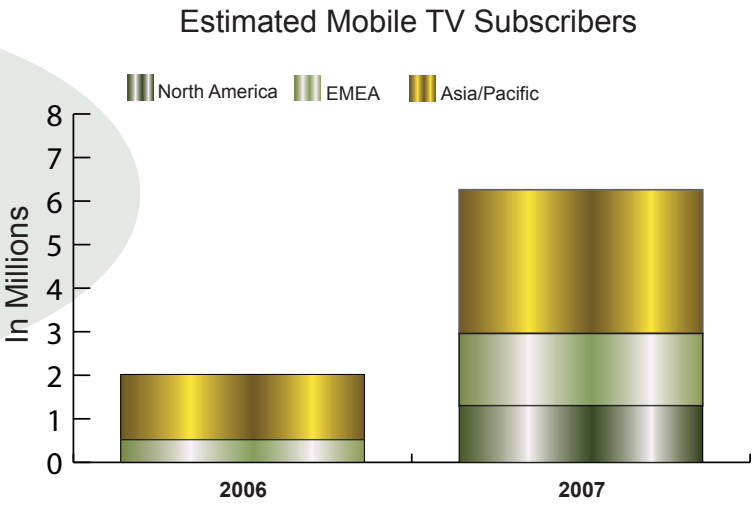




Moore Analysis

FOOTING THE BILL

Mobile Broadcast TV: Do Providers Have Access to the Right Business Models?



The jury is still out on who will pay for mobile broadcast TV services – consumers or advertisers, or other players in the mobile video value chain. Today, the DVB-H, MediaFLO, and S-DMB platforms are ramping up their services under the monthly subscription model; T-DMB and ISDB-T services use the traditional broadcast ad-supported business model.

There is no particular innovation in these models, which may not even be a requirement for a successful mobile TV market. But, for those transferring a classic pay TV model to new mobile TV services, there is one question that has yet to be answered. When do consumers reach saturation for media services subscriptions?

It's too early to answer that question for the infant broadcast mobile TV market. DTC estimates that there were about 2 million subscribers paying for a broadcast mobile TV service worldwide in 2006, and we estimate that will grow to about 6 million in 2007. Not surprisingly, free, advertising based mobile TV services are reaching a greater number of devices/people. With Korea's T-DMB and Japan's ISDB-T broadcast services representing the majority of free services, DTC estimates that more than 5 million users were viewing free TV on mobile devices.

If mobile TV broadcasters encounter consumer reluctance to add mobile TV to the menu of monthly media and data services, innovative business models may be needed. But because of the one-way nature of the broadcast mobile TV network, service providers lack some tools that are available to service providers operating two-way networks. For example, two-way networks provide the potential for unique location and usage data tracking. This information might be used for targeted location and personal preference advertising – a type of advertising the consumer might be more open to receiving. Whether or not this lack of customisation for one-way broadcast networks will hobble the burgeoning mobile broadcast TV market is not yet known. But as more and more digital media services are added to the menu of electronic services consumers can buy for a fee, it's likely that some of those service providers will be induced to experiment with new business models.

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 latest market research reports market is available at www.dtcreports.com

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In My Opinion – Dr. Klaus Illgner

MAKE IT SIMPLE



Dr. Klaus Illgner received his diploma degree in electrical engineering with an emphasis on communications engineering at Aachen University of Technology, Germany, in 1991. In July 2000 Dr. Illgner joined Siemens AG, Corporate Technology, in Munich, where he was responsible for a team developing new technologies in the field of multimedia communications in heterogeneous networks. In November 2004 he was appointed managing director of the Institut für Rundfunktechink (IRT), Munich a research institute of the public broadcasters in Germany, Austria and Switzerland.

Without a doubt, DTT has become a great success in Europe. The technical foundations were laid by the DVB project in the mid 90s with the development of the DVB-T specification. At the time it was considered the most advanced access technology on the market worldwide, and now with the large scale market introduction its features prove the strong argument for DVB-T. Its central features are efficiency and the flexibility to trade off payload versus error robustness allowing DVB-T to support portable and mobile reception. This flexibility allows shaping DVB-T so that it best fits the national environment, as some countries rely on DTT for over 90 percent of coverage while others need to establish DTT in competition to established cable and satellite services. It took almost seven years for the DVB-T specification to unveil its full potential.
Today, the market has changed dramatically. Around the world a wide variety of systems is about to enter the market. Broadcast-like distribution modes are getting more integrated into other systems. MBMS, UMTS and GSM can simultaneously transmit data to several terminals in the same cell. From a broadcaster's perspective this is not competition, since only a few terminals can be covered per cell. The story however is likely to change with systems like WiMAX, which besides bidirectional unicast also supports broadcast and mobility. One might ask if broadcast systems can have a future, in particular as service usage includes more individual components asking for a combination of bidirectional unicast links in parallel to broadcast.
The answer seems to be yes. Not only is it that it is essential for public and private broadcast corporations to maintain some 'control' of their terrestrial broadcast systems. There are also new market participants entering the arena, looking for dedicated broadcast systems, the first of which are Mobile Network Operators (MNO). The core argument is cost efficiency. How much investment is needed and what is the annual operational cost to serve a number of people simultaneously and with what coverage? And to what extent are consumers willing to pay for these services and service at what quality level? There is an underlying assumption with this thought - implicit access to the UHF band (channel IV/ V). Now comes the tricky part. Broadcast services are predominantly regional or national; there are only a few international broadcast services. National interests are reflected in the national regulation of broadcasting. However, the infrastructure industry and MNOs operate on a global scale. The analogue switch off triggers demand for getting access to released resources.
In the digital world the binding of services to a dedicated link diminishes, resulting in competition between digital transmission systems. Links need to remain competitive and offer distinct benefits. However, what 'competitive' means depends on the national market environment. In some areas DTT must offer a service set matching offerings on alternative links, eventually eating up all capacity. In other environments DTT must be able to evolve fast and support new services, e.g. HD, again eating up frequencies. An important benefit of DTT is the support of portable and mobile usage. This option opened the door for other players with very different business concepts and culture to enter DTT.
Technology has to remain neutral and enable all kinds of services. It is up to the market, in combination with national regulation, to balance out the interests of the market participants. The bottom line is that there is and never will be sufficient bandwidth. As technology advances over time, there is a good prospect to reduce the limitations, e.g. by improving spectral efficiency and flexibility.
New technology only has a chance in the market if the industry supports it and this industry is looking for revenue and margins. The investment in developing new systems pays off only if the envisioned markets are large enough. Isolated national solutions have no chance of economic success. However, there are exceptions. National markets the size of China, India or the US have the required potential. It is well known that China and the US tend to favour national specifications.
The immediate outstanding question is to what extent DVB can continue its success. In contrast to 15 years ago the markets are highly fragmented with different digital transmission systems. Many different systems are available and there are several developments ongoing in parallel, particularly in China, Japan, and India. To get in pole position for the market race DVB specifications must leap frog all other developments – and be able to address the demand of global markets. There must be a significant economic benefit when choosing DVB specifications for the future. In technical terms the specifications will have to be ahead of their time. Technology must not make it difficult and complicated for the consumer. Technology has to serve the consumer by making it simple -- very, very simple.

"..can broadcast systems have a future, in particular as service usage includes more individual components asking for a combination of bidirectional unicast links in parallel to broadcast."

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MARKET WATCH

New from **TeamCast,** the SSH-2000 signal generator complements the company's existing DVB-SH product family. Similar to other signal generator formats proposed by the company, the SSH-2000 includes a full featured DVB-SH modulator plus a complete channel emulator. This latter function is able to emulate real life channel impairments, such as noise, multipath, Doppler, with fixed and mobile channel profiles (e.g. TU6). www.teamcast.com.



TeamCast SSH-2000 Signal Generator

RGB claims it new Broadcast Network Processor (BNP) delivers the cable industry's highest density solution for digital video grooming, statistical multiplexing, transrating, digital programme insertion and digital overlays. With the ability to process more than 500 video streams in 1RU, the BNP significantly lowers the cost of delivering advanced digital video services in a variety of environments, including broadcast and switched digital video, while offering revenue generating capabilities through targeted ad insertion. www.rgbnetworks.com



RGB Broadcast Network Processor

The new Magnum digital TV transmitter series from **Screen Service Broadcasting Technologies** for SFN and MFN networks is equipped with an internal exchanger, which can accommodate one or two transmitters. Each apparatus can either be master or slave. The transmitters of this series feature a built-in SFN adapter and advanced technology which allows implementing different modulation patterns for either digital or analogue in the same hardware. Innovative firmware allows zero error signal processing thanks to an internal 32 bit architecture. www.screen.it



Screen Service Broadcasting Technologies' Magnum

UniSoft Corporation is now offering as a subscription service an MHP version of XFSI's XAV application validator. XAV is a tool which applies validity, interoperability, security and efficiency tests against a variety of application formats. XAV produces detailed test reports to assist diagnosing and correcting application problems. XAV is an ideal tool for MHP application conformance testing. www.unisoft.com

The Micronas APB 71x6/8I DVB-T hybrid PC-TV PCI express processors easily integrates into notebooks, desktops, and PC-based consumer devices. The small form factor 19x19 mm BGA package and low power consumption make it a solution for ExpressCard and Mini Card applications. The company's comprehensive IP library of field-proven cores like DVB-T and audio-video decoding with 3D comb filter option, enables integration and lowers the system BOM while accelerating time-to-market. www.micronas.com



Micronas DVB-T hybrid PC-TV PCI express processor

UDcast has introduced its advanced DVB-H/SH IP Encapsulator. This key component of the DVB-SH head-end enables reception of TV channels on mobile devices directly from the satellites or terrestrial repeaters. The system operates in the S-band (2.2GHz) available across Europe and US for the satellite to mobile services. www.udcast.com



UDcast DVB-H/SH IP Encapsulator

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- DVB-T/DVB-H demodulators,
- DVB-H portable test receivers.



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Further information at: **www.teamcast.com**

Strategy & Technology has released the latest version of I-Framer 3, a software tool to create MPEG I-Frames for use in interactive TV services, etc. The new version supports multiple input file formats including BMP, GIF, JPEG, EXIF, PNG and TIFF, and a mask to allow selective MPEG encoding of detail areas at higher resolution. All standard TV formats and aspect ratios are supported at both SD and HD resolutions. www.s-and-t.com

R & S Broadcast Tester SFE



The new multi-standard broadcast test signal generator **Rohde & Schwarz** SFE supports all major digital and analogue TV and audio broadcasting standards. It combines a high-precision RF modulator, real-time coders and baseband signal sources for digital transport streams and analogue video test pattern. A noise source and bit error rate tester can be included optionally. The signal generator is designed for the following applications: R&D, quality assurance, and service and production testing. www.rohde-schwarz.com

ProTelevision Technologies are now offering Echo Canceller PT2791 as an option for its PT2090 Digital Repeater. The PT2791 can be used to reduce the power level of self induced echoes as well as echoes present in the original input signal. The objective of the echo cancelling functionality is to improve usable output power level, enhance repeater coverage and improve quality of service by 'cleaning up' the input signal prior to transmission. The power level of echoes can typically be reduced by 30dB. www.protelevision.com

From **Tektronix**, the PQA500 Picture Quality Analyzer, a new generation picture quality analysis tool. Incorporating eight new Tektronix patents and embodying the most comprehensive Human Vision Model, the PQA500 provides a complete suite of measurement and diagnostic tools for picture quality analysis including full support of high definition formats. www.tek.com/video



Tektronix PQA500 Picture Quality Analyzer

Verimatrix is extending its software based content security solution VCAS (Video Content Authority System) to mobile TV with support for DVB-H & DVB-IPDC. VCAS provides unified content protection for all types of pay TV services including seamless support for DVB-IP hybrid networks and DVB-H & 3G mobile devices. A key benefit for mobile TV operators is the ability to manage content security in handheld devices without the need for smart/ SIM cards. VCAS is DVB Simulcrypt compliant. www.verimatrix.com



UBS UBwave DVB-T/H modulator OEM version

UBS has introduced an OEM version of its UBwave DVB-T/H modulator. Ideally suited for applications such as integration into transmitters, test and measurement equipment or as a part of a quality assurance laboratory, the modulator provides a high performance output at an affordable price. Like its commercial sister product, the OEM version supports both SFN and MFN operation. Other shared features include integrated linear and non-linear pre-correctors, remote management capabilities and hierarchical mode support. www.uniquebroadband.com

Pixelmetrix enhances its test and monitoring platform with the DVB-H Analyzer. It works with the DVStation family of test and measurement systems. A key feature of the DVB-H Analyzer is a graphical display of time-slicing information. Measurements such as the MPE-FEC error ratios, power saving, and burst information (bit rate, burst size, burst jitter) are also provided. www.pixelmetrix.com

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Is DVB-H limiting your mobility?

Mobile carriers know their subscribers expect to have service everywhere; in their homes, offices, outdoors, on the road, on the train…

DVB-H rollouts have shown there is an appetite for mobile TV in many large urban centers, but what about serving users between cities and in small communities? Commuters are increasing traveling large suburban and intra-urban routes; commuters that are your potential mobile TV subscribers.

DVB-SH offers a cost effective way to blanket large geographies with mobile TV coverage using a hybrid satellite/terrestrial SFN. Over the next few years, leading satellite operators are planning launches of DVB-SH services. Now is the time to start planning your DVB-SH strategy.

UBS has launched the first suite of head-end and repeater products for DVB-SH. We have the technology and the mobile TV network experience to help you today with RF coverage design, location planning, technology trials and ultimately a successful rollout!



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