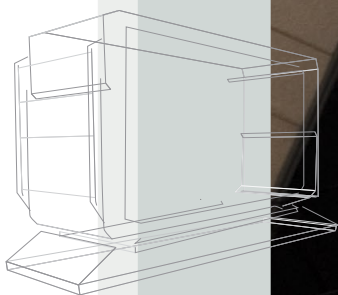


# DVB-SCENE

Tune in to Digital Convergence



18

# DVB®

The Standard for the Digital World

## This issue's highlights

- > TVA-Europe
- > GEM & Blue-ray
- > Coding & HDTV in Europe
- > Analysis: DTT Health Check
- > Update: Africa
- > Update: Australia
- > Market Watch

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# THE STEADY MARCH OF DVB-H

## A word from the DVB Project Office

Welcome to another edition of DVB-SCENE – this one following on from NAB '06 and the relentless march of DVB-H – DVB's Mobile TV standard. In April 2006, we heard of further steps leading to the launch of two DVB-H services in Italy (La Tre; Mediaset/TIM) in June 2006, and the addition of another commercial DVB-H operator in the US market, Hiwire Mobile TV. And all of this while ETSI is still finalising some of the specifications... IPTV proved to be another highlight of NAB, with many manufacturers presenting their IPTV solutions. DVB continues its work providing standards to facilitate the delivery of transport stream -based DVB services over IP networks. This calls for close co-operation with other bodies operating in the same space. The Project Office is kept busy managing liaisons with organisations such as ATIS, CableLabs, DLNA, DSL Forum, ETSI TISPAN and the Home Gateway Initiative. Perhaps a surprising outcome of this year's NAB was the growing interest in Pay-TV based DVB-T in Latin America. The DVB Pavilion was visited by a number of Pay-TV operators from the region seeking practical information on the deployment of 6MHz inexpensive



Peter MacAvock, Executive Director

DVB-T systems which would be used for the delivery of their subscription services. It's good to see DVB chosen in environments where technical and commercial considerations are paramount! Such interest is typical of the diversity of the DVB standards – from

interactivity in HDTV BluRay disc applications, through to the developing media world in Africa and on to FIFA World Cup soccer in glorious HDTV. DVB has become well known in areas we couldn't have imagined when the Project first set out to digitise analogue PAL television.

Cover: Australia's Sydney Tower

## NEW STANDARDS:

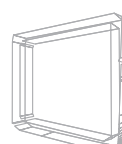
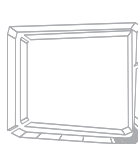
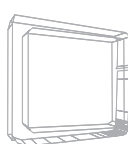
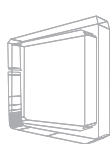
**TS 102 005 V1.2.1 'Specification for the use of Video and Audio Coding in DVB services delivered directly over IP protocols' (02/05/06)**

**TR 102 470 V1.1.1 'IP Datacast over DVB-H: PSI/SI' (20/04/06)**

**TS 102 471 V1.1.1 'IP Datacast over DVB-H: Electronic Service Guide (ESG)' (22/04/06)**

**TR 102 473 V1.1.1 'IP Datacast over DVB-H: Use Cases and Services' (22/04/06)**

## NEW MEMBERS



**Iwedia Technologies**

**PacketVideo**

**IBBT-Ghent University**

**Flextronics Corporation**

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

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# TVA-EUROPE IS HERE TO HELP

Jean-Pierre Evain, Secretary, TVA-Europe

The TV-Anytime Forum ceased its activities in August 2005 after having delivered a comprehensive set of metadata specifications that can be downloaded free of charge from ETSI ([www.etsi.org](http://www.etsi.org)) in the TS-102-822 series.

Following similar initiatives in Japan and Korea, a group of European implementers joined together in October 2005 to form the 'TV-Anytime European User Group' so called 'TVA-Europe'. The group is co-chaired by three representatives from key sectors, i.e. David Cutts from S&T representing the manufacturers, Ben Schofield from BDS representing the metadata aggregators and Peter Olaf Looms from DR representing the broadcasting community.

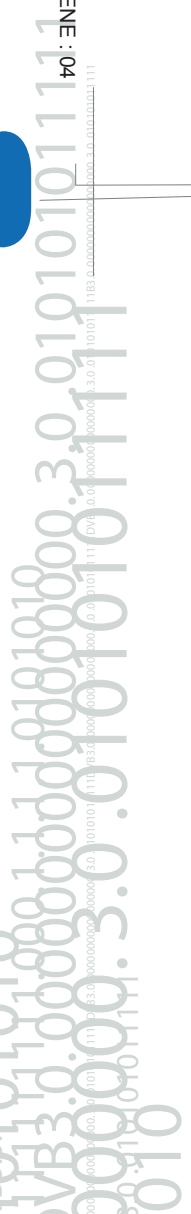
TV-Anytime is a core technology that will play a growing role over the next few years. The Electronic Programme Guide is only the visible part of the iceberg. TV-Anytime provides much more functionality than e.g. the DVB Service Information (DVB-SI). DVB has wisely recognised the importance of TV-Anytime by promptly developing a set of accompanying specifications for the transport and delivery of this information over broadcasting and IP networks. Services to mobiles being launched in Italy use DVB-CBMS also partly using this solution. The time has now come to launch more metadata services taking advantage of published standards. TVA-Europe, which includes experts from the TV-Anytime Forum, is there to help.

Although the fundamental actions of TVA-Europe will be to assist implementation and monitor progress in different countries, the first priority has been to engage in discussions with ViaLicensing on the terms proposed and published on the ViaLicensing website for TV-Anytime Phase 1 ([www.vialicensing.com](http://www.vialicensing.com)). There is a good spirit of cooperation to clarify some of the licensing terms and conditions that will probably need to be revised for better and larger adoption, hopefully soon. ViaLicensing has recently issued a call for patents on TV-Anytime Phase 2. On the technical side, the UK DTG TVA Testbed is active in developing solutions for a future market deployment of TV-Anytime services. These activities have been encouraged by a report from the UK's Department of Trade and Industry positively assessing the need for 'TV-Anytime Metadata Provision'. The UK DTG Testbed studies include the consideration of operational issues such as collecting and feeding broadcast systems with data from different broadcasters sharing a multiplex. This is also one of the issues on which SkyPerfectTV has been working in collaboration with Sony using TV-Anytime for its business-to-business management system demonstrated at NAB'06. On the business side, European service providers seem to have difficulty in fully appreciating new challenges such as the PVR. Members of TVA-Europe spend considerable

time communicating on these issues. For example, the EBU organised a workshop on PVRs in September 2005 during which several key issues were highlighted showing important differences on how PVR services can be developed, transforming the threat into opportunities for broadcasters without necessarily endangering their advertising revenues. Another conference on Peer-to-Peer has also shown a strong potential role for PVRs. Awareness is rising and TV-Anytime is the only existing standard ready for use. However, more effort is needed before business decisions are made. Joining TVA-Europe is easy: simply e-mail Jean-Pierre Evain at the EBU ([evain@ebu.ch](mailto:evain@ebu.ch)). No fee is required and there is no need to sign a Memorandum of Understanding. TVA-Europe doesn't intend to develop any technology that could give rise to IPRs or need protection against antitrust laws. TVA-Europe is simply 'a best effort' from key European players collaborating positively and in good faith for the successful development of an essential standardised technology.



**Jean-Pierre Evain graduated from ENSEA in Cergy-Pontoise, France, and after several years working in research and development for France Telecom and Deutsche Telekom he joined the European Broadcasting Union in 1992. More recently, he chaired the metadata subgroup of TV-Anytime and now acts as TVA-Europe Secretary. He is responsible for managing all metadata issues within the EBU's Technical Department. He also represents the EBU in the domain of digital rights management and copy protection, particularly in DVB.**



# GEM GLITTERS IN THE HEART

**Bill Foote, Sun Microsystems & Chairman, MHP Umbrella Group**

The Blu-ray Disc format is set to replace standard definition DVDs, starting this year. Backed by entertainment companies such as Disney, Fox, Paramount, Sony Pictures and Warner Brothers, as well as technology companies such as Apple, Dell, LG, Panasonic, Philips, Pioneer, Samsung, Sony and Sun Microsystems, this format will offer high definition video, high quality sound and advanced interactive features for movie titles and other video content.

At the core of Blu-ray Disc's interactivity is the DVB-GEM specification. GEM, which stands for 'Globally Executable MHP', is the standard for global interoperability of interactivity related to television. Already, GEM guarantees a high level of application portability by defining an interoperable 'core' of the DVB's Multimedia Home Platform (MHP) specification that is guaranteed to be present in other specifications, such as the CableLabs OCAP specification for North American cable TV. With the adoption of GEM by the Blu-ray Disc Association, this guarantee of application portability extends into the market currently occupied by the legacy DVD format.

The DVB-GEM specification extracts a universal 'common core' platform from the DVB-MHP specification. Thus, it removes some elements of MHP that depend on the specifics of DVB networks, such as the signalling of service information. Instead, it requires the definition of functionally equivalent technologies by adopting specifications. To accommodate the needs of a disc based format, GEM definitions were added for 'packaged media' target specifications. For packaged media targets, a small amount of additional subsetting was required, to remove features that cannot naturally be mapped from a broadcast environment to a prepackaged media environment. For example, the application authentication mechanism of MHP, which was optimised for broadcast over an object carousel, is most naturally replaced in Blu-ray with a mechanism more suitable to packaged media. Similarly, the MPEG-2 section filter API, which is useful for receiving legacy data in broadcast environments, does not

naturally have a place in a stored media format where MPEG-2 is often replaced by more advanced technologies such as H.264. Thus, for packaged media targets, GEM does not require these features.

Despite the necessary but small amount of subsetting, a very rich and complete platform is available for applications written to run in both environments. This can be used, for example, to broadcast the interactivity designed for a Blu-ray movie title over an MHP or OCAP based Video-on-Demand network, or to support the interactivity originally designed for broadcast to be supported on a season compilation disc. Such applications have available to them the entire GEM platform, which includes:

- The core Java platform from Sun Microsystems.
- The full range of Java APIs required by MHP for positioning and displaying application generated graphics over video.
- An API for receiving events at predefined times in the video playback. This API is realised by DSMCC (Digital Storage Media Command and Control) stream events in MHP, and by a different signalling mechanism in Blu-ray Disc.
- APIs for TCP/IP Internet access in devices featuring a network connection.
- Downloadable fonts.
- Remote control input.
- The security guarantees of the Java platform and the MHP permissions-based security model.

Blu-ray Disc adds features to GEM, such as features for accessing the title and chapter structure of a disc. Blu-ray also includes other features, such as guaranteed high definition application graphics, and a mechanism for animation of application graphics that is frame-synchronous with the underlying video. Future version of these features, as appropriate, working through the liaison arrangements of Blu-ray/DVB. Of course, as with all MHP/GEM platforms, application interoperability and the correct functioning of implementations is guaranteed by a comprehensive set of conformance tests from the MHP Test Consortium and Sun Microsystems. Ensuring

platform compatibility through conformance testing is one of the pillars of the DVB Project's engagement in standards related to interactivity.



Overall, the future is bright for the MHP/GEM family of specifications from the DVB. Developers and tools vendors will have a larger target market, and as a result consumers will have a wider array of interesting content and services to choose from. We look forward to many creative applications of GEM's Java based interactive platform, which will enhance the high definition movie titles to be released in the Blu-ray format in the months and years to come.



**Bill Foote has been working in standardising Java technologies for television devices for seven years. He is the chairman of the DVB-TM-MUG subgroup, and Sun's primary technical representative to many television related standards organisations, such as DVB, the Blu-ray Disc Association and CableLabs. Prior to working in standards, he was on the Personal Java team, and the HotJava Browser team before that. He also created HAT, the Heap Analysis Tool, which has since been incorporated into the desktop Java platform.**

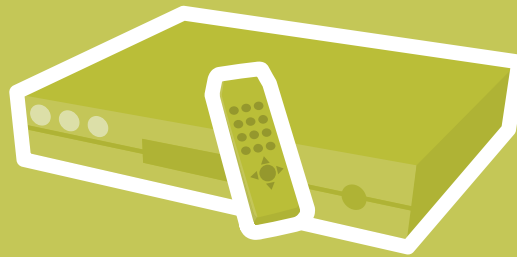
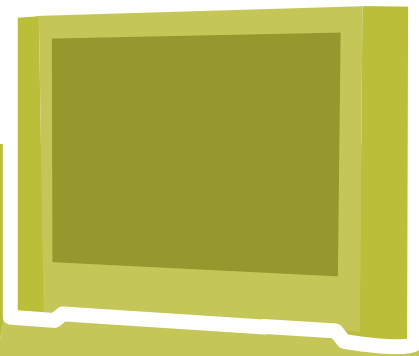




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# HDTV IN EUROPE: THEORY & PRACTICE

**Ken McCann, ZetaCast**  
Chairman, TM Ad Hoc Group on Audio Visual Content (DVB-AVC)

One of the great strengths of the DVB architecture is that the same generic specifications are used for the baseband signal regardless of the delivery medium. This means that the same DVB video and audio coding specification, TS 101 154, is used for any DVB HDTV service that is based on the MPEG Transport Stream whether this is delivered via terrestrial, satellite, cable or a phase 1 IP network. DVB specifications have supported HDTV since 1998 and the first commercial HDTV deployment in the DVB world began in Australia in 2001. However, it is only recently that major commercial HDTV services have launched in Europe. This means that Europe is now able to deploy second generation DVB systems, e.g. using a combination of DVB-S2 transmission and H.264/AVC video compression coding.

A key issue for broadcasters is deciding what bit-rate is actually needed in practice to give a reasonably good quality HDTV picture. This is a complex issue, as there are many factors to consider:

- Coding Specification - MPEG-2 or H.264/AVC or VC-1?
- Encoder implementation - single pass or multi-pass?
- Nature of content - talking heads or sports material?
- Video format - 720p or 1080i?
- Statistical multiplexing - constant bit-rate or variable bit-rate?
- Customer proposition - good picture quality or lots of channels?

Although the specifics depend on many factors, the general trend is one of improving coding efficiency over time. Within that, there are periods of evolution, due to improving encoding implementation within a specification, interspersed by moments of revolutionary change to a new algorithm, when a new decoder is needed. The primary driver for both the periods of evolution and the moments of revolution is that Moore's Law allows more complex processing to become practical over time.

In an attempt to translate the effects of Moore's Law into bit-rate, I came up with the modestly named McCann's Law, first described at DVB World in 2003. This states that the bit-rate required to achieve a given audio or video quality halves every five years, assuming that both evolutionary and revolutionary improvements are implemented as early as possible.

In the real world, improvements do not follow a smooth curve as legacy issues allow only infrequent changes of algorithm.

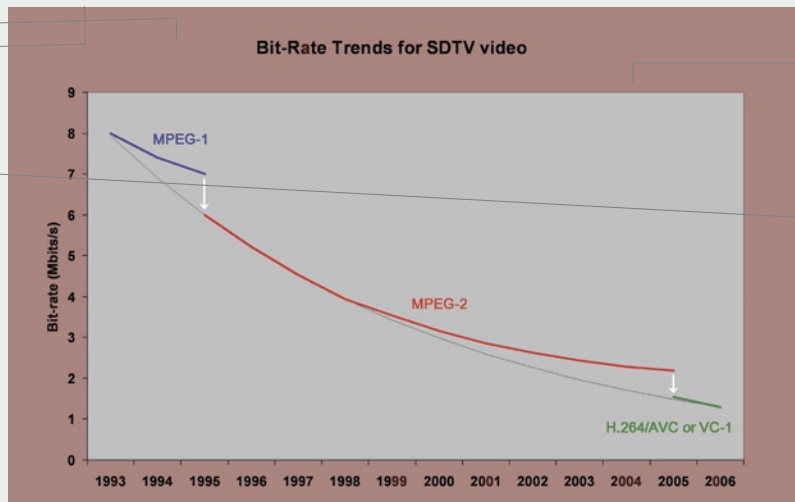
In 1993, a practical SDTV MPEG-1 encoder needed about 8Mbit/s to give reasonable quality. The first MPEG-2 encoders in 1995 needed about 6Mbit/s and since then there has been progressive improvement until today it's possible to get reasonable quality using MPEG-2 at an average video bit-rate of about 2 Mbit/s, when part of a statistical multiplexing group. However, the potential for further improvement with MPEG-2 is now reducing and to get back to the idealised curve requires an algorithm change to one of the advanced coding specifications: H.264/AVC or VC-1.

However, in the case of real-time HDTV encoders, the rate of improvement in practice has been significantly less than for SDTV. One reason for this is that the smaller number of channels per multiplex means that the introduction of



encoders to be better tuned. At DVB World this year I predicted that in a year's time the best implementations of the advanced coding algorithms should allow good quality HDTV video at about 8-10 Mbit/s for 1080i and about 6-8 Mbit/s for 720p.

But in the meantime, my plea to broadcasters is to avoid the risk of giving HDTV a bad name by prematurely cutting the bit-rate. HDTV is sold to customers on the basis of excellent picture quality and it's important that is what they get. With today's encoders that may mean initially allocating up to 15Mbit/s per channel.



statistical multiplexing techniques did not yield as much of a benefit for HDTV as it did for SDTV. But the main reason is that today's real-time HDTV encoders for H.264/AVC or VC-1 do not yet fully exercise all of the additional tools in the new algorithms, such as variable block sizes. Non real-time software encoding shows about a factor of two improvement over MPEG-2, whilst the improvement with real-time hardware encoders is only marginal.

Over the coming year I expect this situation to change significantly, as more of the new tools are included and improved understanding of how the various tools interact will allow the

**Ken McCann is a director and co-founder of ZetaCast, an independent technology consultancy company specialising in digital TV. Prior to founding ZetaCast, Ken worked at NTL, Symbionics and Philips. He was responsible for the development of the world's first broadcast quality MPEG-1 decoding equipment and the world's first real-time MPEG-2 encoding system. Ken contributed significantly to the development of the MPEG-1 and MPEG-2 standards and has chaired the DVB technical group responsible for audio visual coding specifications (TM-AVC) since its inception over 10 years ago.**





# EXPERIENCE AFRICA

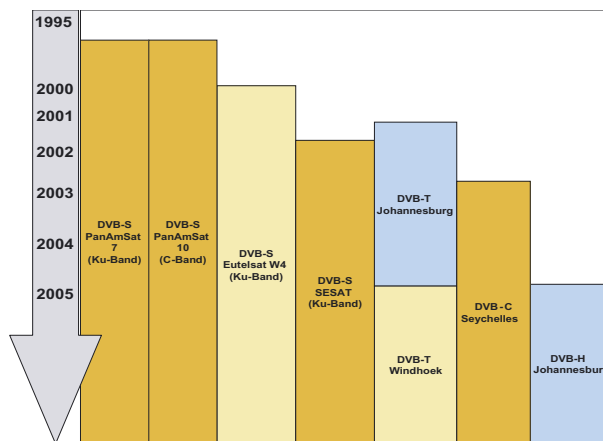
**Martin Ungerer, Broadcast Engineering Group Manager  
Multichoice SMS (Pty) Ltd**



Multichoice SMS, based in South Africa, launched Direct-to-Home television services in 1995 broadcasting to fifty states in Africa, covering the Sub-Saharan region from Senegal in West Africa to the Indian Ocean Islands in the East. Using various satellite platforms, C-Band and Ku-Band, a total of 24 transponders are currently being used to carry 170 video, audio and data services. With 1.1 million subscribers in South Africa, 400,000 in the rest of Africa with 220,000 still on the old analogue system, Multichoice is still a leader in the Pay-TV arena for Africa. Multichoice also has operations internationally in Greece, China, Cyprus and Thailand.

The DVB standard is slowly gaining momentum on the African continent with some quantum leaps during the post 2000 period. Although digital satellite systems kicked off during 1995 with the first Pay TV platform offered by Multichoice, the rest of Africa was lagging in any DVB systems being deployed. MNet, a content provider in South Africa started the first DTT test transmission in the Johannesburg area in 2001 which ran until 2004.

In 2004, Multichoice deployed a DTT system in the Namibian capital, Windhoek. Using all the lessons learned and experience in this type of broadcast, the system replaced the analogue system. No dual illumination period was possible due to spectrum scarcity, but clever logistical tricks were used by preprogramming the default parameters into the DTT decoders, which meant that a plug & play approach could be used to ease the digital transition without any problems. The biggest challenge faced was to find a VHF digital transmitter which catered for Channel 13, a very odd frequency used nowhere else but in Africa!



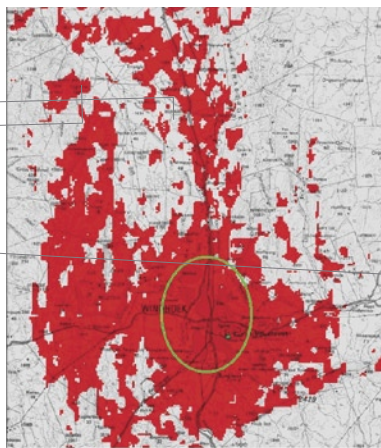
**Growth of DVB systems on the African Continent**

In 2005 Multichoice requested the Regulator for an amendment of the DTT test license to include a DVB-H trial license. This was granted and the first DVB-H test transmission started in October 2005. The initial broadcast covered only central Johannesburg, but has now been expanded to include the capital city, Pretoria and the main highway connecting the two cities. The next area to be covered is Soweto, one of the biggest suburbs in the south of Johannesburg. The network is a SFN system, carrying 14 video services and

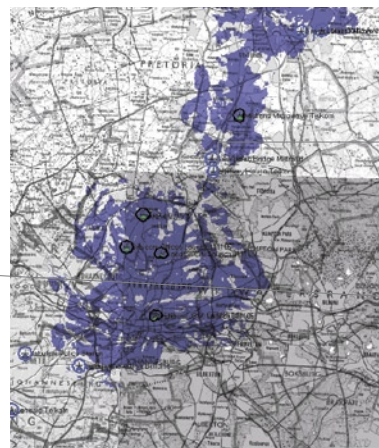
although the trial is nonsubscription based, it is only available to a closed user group, selected by a market research company. The trial is both testing the technology as well as user behavior.

Multichoice also deployed a DVB-C system in the Seychelles, which uses its satellite feed on PanAmSat 10 (C-Band) and transmodulates from DVB-S, QPSK to DVB-C, 64QAM. Other cable systems are deployed in Southern Africa in Mozambique and Angola.

**The Windhoek DTT coverage. The city enclosed in the circle.**



**Planned coverage, with Pretoria in the north and Soweto in the south.**



**Johannesburg's Telkom tower, the site of the first DVB-H transmission.**

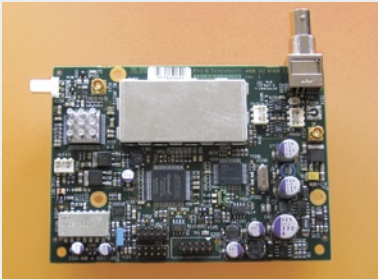








# MARKET WATCH



## ProTelevision Auxillary IF Output Board

**ProTelevision** has introduced an auxiliary IF output board that supplies a modified copy of its PT5780 main IF output. It is intended for supporting transmitter delay diversity and frequency diversity by adding a small delay or frequency offset to the signal. In a SFN network, an interference zone with flat fading could occur where the delays between two transmitters are equal. By adding an extra transmitter antenna with a delayed version of the signal, it allows for alternative paths. [www.protelevision.com](http://www.protelevision.com)



## Envivio 4Caster M2

The **Envivio 4Caster M2** is a live MPEG-4 H.263/H.264 encoder that optimises video for delivery to mobile television subscribers. MPEG-4 compression ensures the highest quality video at the lowest possible bit rates. The real-time M2 encoder supports key data rates appropriate for transmission over satellite and terrestrial systems with operator proven compatibility to a wide range of mobile devices. Compliance with international mobile delivery standards including 3GPP, DVB-H, and ISDB-T allows the M2 to reach the highest number of subscribers and makes it an ideal system to support the mobile applications of today and tomorrow. [www.envivio.com](http://www.envivio.com)

**Iwedia Technologies** has launched its Comedia middleware, a comprehensive solution applicable to multiple devices: integrated digital TVs (iDTV), set-top boxes as well as multimedia mobile phones. Embedded in a DVB iDTV plug-in module, it seamlessly turns analogue TVs into iDTV units. Used to operate a DVB digital set-top box Comedia enables delivery of rapid time-to-market, cost effective devices without compromising added value features (HDTV, PVR, etc.). The solution is also aimed at DVB-H enabled handheld devices, such as multimedia mobile phones, for which it provides a DVB-CBMS compliant system layer. [www.iwedia.com](http://www.iwedia.com)

**TeamCast** has introduced an L-Band version of its DVB-T/H modulator (MOD-02050) and Calibrator, a test instrument providing automatic calibration of the digital pre-correction stage which is internal to its modulators. The MOD-02050 covers the 1400 to 1700 MHz frequency range, and can be used in the US and other markets adopting the L-Band for Mobile TV. The Calibrator instrument allows transmitter and base station manufacturers to deliver their products with the highest output power and efficiency, at the lowest cost. [www.teamcast.com](http://www.teamcast.com)



## TeamCast Calibrator

**Sofia Digital's** Backstage Mobile Digitext is a solution for bringing digital teletext services to Mobile TV. The system is designed for DVB-H and includes tools for managing mobile



## Sofia Digital Backstage Mobile Digitext on Nokia N92

digitext services, authoring and editing content and interfaces for content repositories already in use. It utilises existing digital teletext or web content and services making rollout for mobile digitext services fast and easy. Digitext services are sent to the Mobile TV terminal via a DVB-H filecast and the cellular network is used as the return channel. [www.sofiadigital.com](http://www.sofiadigital.com)



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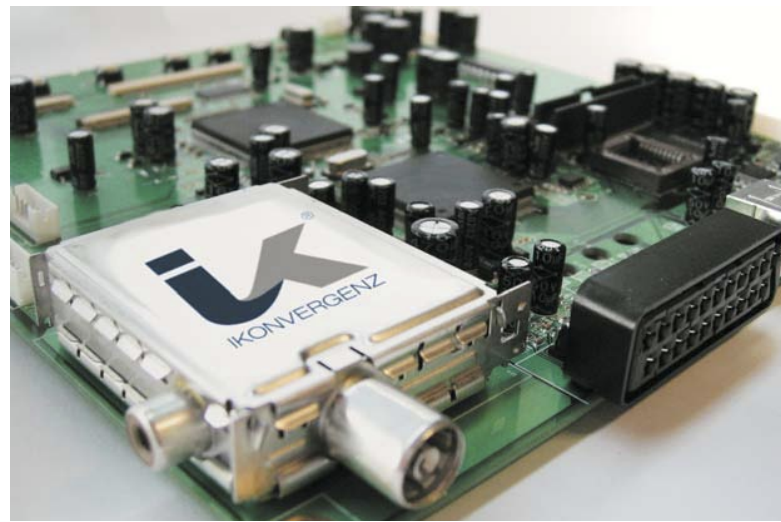
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