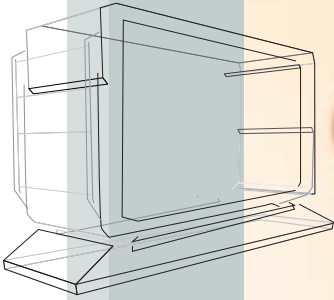Tune in to Digital Convergence

DVB - SCENE
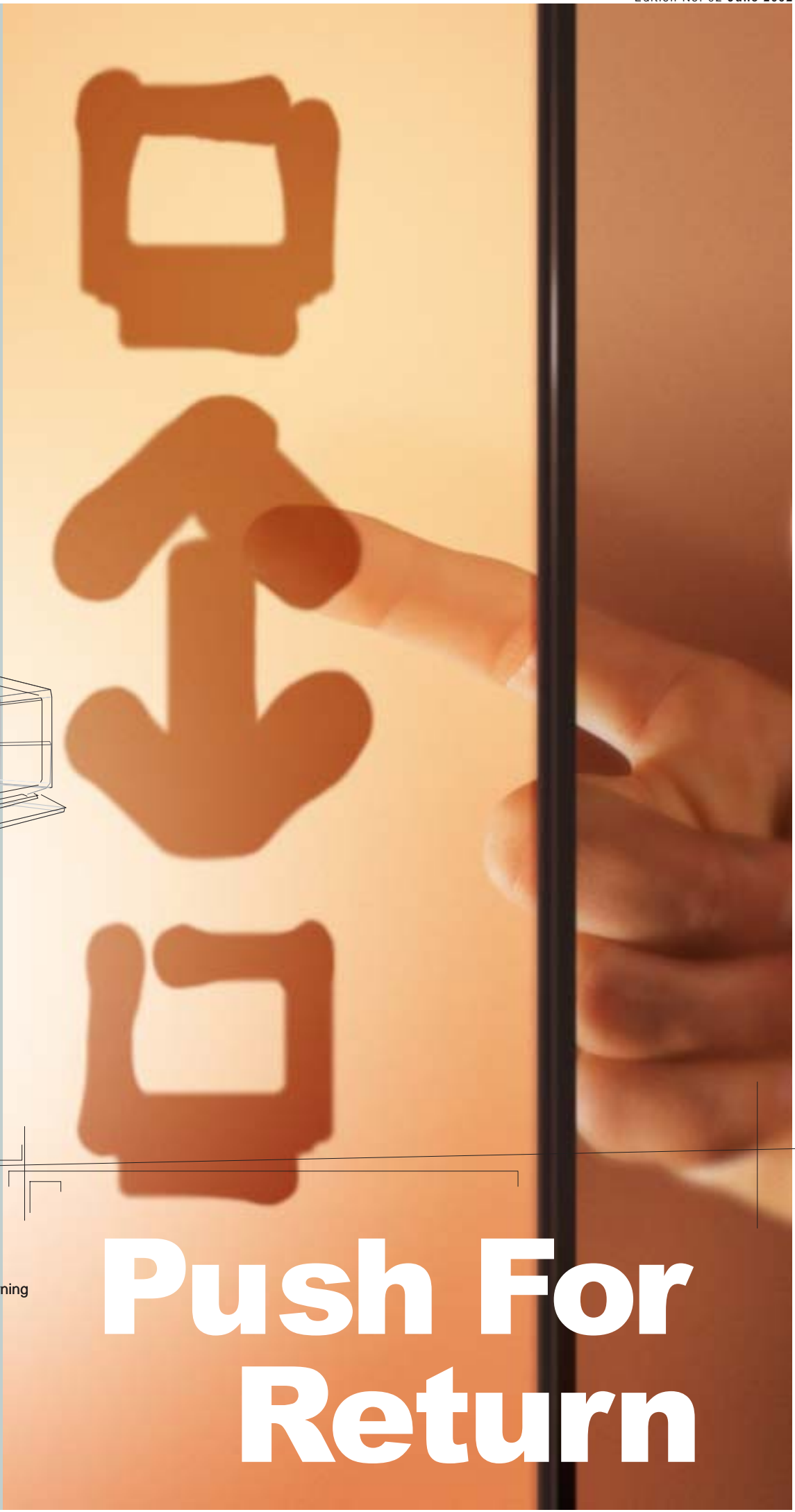
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The Standard for the Digital World

This issue's highlights

> Report on the current status of DVB-RCS
> DVB-S powering distance learning
> Patent Pooling
> MHP conformance testing
> DVB-T in Tawain
> Product Bulletin

Push For Return

TURBULENT TIMES FOR
DIGITAL TELEVISION

A word from the DVB Project Office

Peter MacAvock, Executive Director

Issue 2 of DVB Scene comes to you in the face of difficult times in the digital television industry in Europe. This is particularly so with the demise of the digital terrestrial pay-TV operators - ITV Digital in the UK and Quiero TV in Spain. Failures of this magnitude will have a serious impact on the industry - perhaps causing some change in direction on the part of regulators, but digital terrestrial TV (DTT) will carry on - it has to.

A recent study by the European Broadcasting Union indicates that almost all European countries will have DTT by 2005. It is unclear which

business models are to be adopted, but the failures in the UK and Spain will certainly provide food for further thought. One reassuring element is that receiver prices are now much lower than they were at the time of the UK launch, and thus in a better position to compete with DVB-C boxes on cable and DVB-S boxes on satellite.

DVB remains a key facilitator for the digital television industry. In the face of the collapse of ITV Digital and Quiero, DVB technology remains a shining example of how a co-ordinated approach to digital TV delivery can reap benefits. ITV Digital's major competitors are NTL on cable (using DVB-C) and BSkyB on satellite (using DVB-S). The content providers are able to furnish content either for the DTT platform, cable or satellite platforms, and other elements of the industry benefit from the cross-platform interoperability. As the free-to-air services in the UK shared common elements with the Pay-TV operator, e.g. SI generation (Service Information), there will need to be some revisions to

their arrangements, but there is no doubt that free-to-air will continue. At no time during the debate about why ITV Digital or Quiero failed has the DVB-T technology underpinning the platforms been called into question.

On a lighter note, this issue of DVB Scene concentrates on three major areas. The first is recent developments in the DVB's powerful return channel satellite specification - known as satellite interactive terminals in some quarters. Prof. Gunnar Stette, working for the European Space Agency, explains recent developments in the area, and there are articles outlining the impact that the specifications are likely to have on the industry. MHP remains a hot topic: Rainer Schäfer (IRT) outlines the MHP Test Suite development process, while Jud Cary (CableLabs) guides us through the thorny field of intellectual property rights.

We hope you like this edition of DVB Scene. Our aim is to provide the industry with up-to-date news on DVB issues. Should you have comments or suggestions for improving the content of DVB Scene, please don't hesitate to contact us.

GUNNAR STETTE
CHAIRMAN DVB-RCS
REPORTS ON THE
CURRENT STATUS OF
THE STANDARD

DVB-RCS, interactive digital broadcasting with return channel via satellite, can be seen as the long distance version of the very successful WLAN (Wireless Local Area Network) systems of different types which are expanding rapidly, and where the provision of Internet services is the main driving force.

The RCS systems provide broadband access independently of the local infrastructure and are therefore available universally, something that is recognised by governments and the EU. National governments are keenly aware of the need to provide universal broadband access, and are constantly seeking ways to remove the digital divide. Many governments have targets in place for the provision of universal

Internet access to their citizens towards effective broadband and higher bandwidth networks.

DVB-RCS is based on the very successful digital TV broadcasting system via satellite, DVB-S. Digital broadcasting systems with return channels via different transmission media have been standardised within the DVB ETSI framework, and RCS, the last member of that family, can be implemented by an incremental investment to the existing systems.

A new version of the standard has been produced on by the ad-hoc group and approved by the DVB Technical Module. There are two significant changes in this new version of the standard whilst ensuring full backwards compatibility.

The first version of the RCS system was based on the use of transparent satellite transponders, of the "bent pipe" type, for the return direction. With the general expansion of broadband systems, also systems using satellite, new satellite terminals are being developed. It is in everybody's interest to harmonise the terminals and to obtain any synergy that can be achieved between different systems. The synergetic effects of this can result in a wider market with lower terminal costs.

Without going into details it can be mentioned that additional elements have been incorporated into the first version of the signalling system of RCS. One is to define a destination forward link in a regenerative system

C. Elia - ESA, M. Gouta - ESA, V. Foix - CNES, E. Weller - Eutelsat, J. R. Lopez - Hispasat, M. Battihka - Intelsat, J. Krause - SES-Astra, B. R. Anderson - Telenor, D. Mignolo - Alenia Spazio, Ch. Rigal - ASPI, S. Defever - Astrium

DVB-RCS TERMINALS FOR REGENERATIVE SATELLITE MULTIMEDIA SYSTEMS

DVB Return Channel via Satellite (DVB-RCS) forms the specification for the provision of the interaction channel for GEO satellite interactive networks with fixed return channel satellite terminals (RCST). The standard, developed under the auspices of the DVB Forum, was created through the cooperation of satellite operators and satellite equipment manufactures, including system providers, hub manufacturers and terminal manufacturers. Companies from Europe, North America and the Middle East have been involved in this activity. DVB-RCS may well become a global satellite standard that allows equipment manufacturers to focus on the same technical solution, thus providing a healthy and open competitive environment, providing enormous benefits to industry and users alike.

In recent years, the multimedia revolution has created a huge demand for high-speed connections to the network. Satellite systems have been designed to respond to such demand. In particular, Regenerative Satellite Systems will constitute the next generation of telecommunication satellites. They will provide very high speed Internet connections to corporate and consumer users equipped with small (60-80cm diameter) antenna terminals. This is achieved by employing high-frequency bands, multi-spot coverage areas and high-speed digital signal processing on board the satellite.

Following the emergence in Europe of a number of proprietary Regenerative Satellite Multimedia Systems (Skyplex, Domino II, Web/West, Euroskyway) in 1999 ESA took the lead to study possible ways to facilitate convergence of different systems towards a common standard by harmonising the Regenerative Satellite Access Terminals (RSATs).

On ESA's initiative, and with the cooperation of the main interested parties, the Ad-Hoc Group (AHG-RSAT) was created with the aim of developing recommendations that could form the basis for standards for satellite terminals to be designed to operate within a variety of Regenerative Satellite Multimedia Systems (RSMS). The basis of the technical work was the DVB-RCS ETSI Standard.

Members of the AHG-RSAT group include ESA, a number of satellite operators (EUTELSAT, Hispasat, Intelsat, SES-Astra, Telenor), certain satellite system designers (Alcatel Space Industries, Alenia Spazio, Astrium) and the French space agency CNES. European Commission and ETSI were invited as observers. Membership of the group was on a voluntary basis.

AHG-RSAT reviewed a number of reference models, service requirements and system architectures for RSMS, typically featuring not only on-board signal regeneration, but also packet or circuit switching between beams.

Star and mesh network topologies were considered. The connectivity topologies span from point-to-point or multipoint-to-multipoint (physical or link or network layer) scenarios to point-to-multipoint (including broadcasting) and multipoint-to-point.

The main result is the full convergence among a number of initially different systems on the use of one and the same 'harmonised' terminal. Furthermore, the terminal characteristics are based on the existing DVB-RCS. This means that the economies of scale are even greater.

and another is to include an element to identify the capability of a terminal to support dynamic connectivity.

The modifications to the standard address the use of RCSTs for return channels in the DVB system with regenerative satellites, but at the same time incorporate some "hooks" that would allow development of terminals for operation in meshed networks. The incorporation of these hooks at this stage does not create any backwards compatibility problems. The increased cost and complexity is negligible, and it represents a basis for further development to terminals suitable for general broadband satellite networks with satellites having on board processing.

A detailed description of the new elements will be provided in the revised Guideline Document, and the technical work is expected to be finalised at an RCS meeting in mid 2002.

One modification of the standard is that it is symbol rate independent. That means that the system designers may specify, and the equipment manufacturer must declare, the range of symbol rates over which the terminals are capable of operating. The revised Guideline Document, TR 301 790, will also provide information on the relationship between data rate and other related technical parameters, such as the phase noise mask. The reason for this approach is to open the possibility for developing terminals more suited to cover the lower end of the market.

The lower limit for the symbol rate, mentioned in the informative Annex of the first version of EN 301 790, was 128k symbols per second. When transmit power is related to the symbol rate, a rate reduction could lead to lower transmit power and consequently to lower power amplifier cost. This is noteworthy since cost of the power amplifier in the outdoor unit of the terminal is significant.

The revised standard makes provisions for a couple of other optional designs that could enable manufacturers to offer terminals more suitable for the lower end of the market, related e.g. to frequency hopping speed and the range of EIRP control.

**Dick Bakker, Vice President, Sales
SpaceBridge Semiconductor**

DVB-RCS: **STANDARDS AND COMPONENT MIGRATION**

DVB-RCS is showing promise for securing market share in the emerging two-way satcom services world. While the main focus to date has been on the European market in terms of initial trials and planned system rollout, DVB-RCS shows all signs of becoming a global satellite standard.

DVB-RCS systems will initially be used to provide corporate services, however, it is expected a migration into residential services will occur within 2-3 years as costs are reduced and system developers can support a larger number of users on a single platform. Ultimately the technology will play a part in the convergence of satellite video and broadcast services. Building upon the DVB-S standard, RCS provides a means to combine digital TV and Internet services into a single gateway unit.

 The DVB-CS standard specifies flexible terminal requirements. The core of RCS defines the Media Access Control (MAC) and Physical (PHY) Layers for a satellite terminal. The RCS specification extends existing DVB specifications with the addition of MAC

signalling tables based on MPEG table formats and system timing/frequency references based on PCR mechanisms. RCS supports both IP and ATM return paths with several bandwidth servicing classes that can be used for a range of user applications. The provisioning of an MPEG return link provides a path for integration into existing DVB systems.

A terminal designed to the RCS requirements can be adapted to satellite hubs developed by a number of manufacturers. Equipment suppliers can now take advantage of higher volume manufacturing. A fully compliant RCS terminal allows a system operator the freedom to select a number of terminal vendors that can operate on the same hub equipment. In the long term, a system integrator may be capable of selecting indoor and outdoor units, each specified according to RCS, and mix and match them.

First generation equipment has been developed in advance of the finalisation of the RCS specification and several trials have been performed. Operational deployment of RCS systems supporting several thousand terminals will occur in the first half of 2002. The services offered in these systems will utilise a key aspect of DVB-RCS - the ability to scale the hub with the number of terminals and to the provision of a wide range of services based on the particular market of the service provider. For example, a service provider may flexibly build enterprise services like mail, web hosting, and caching over the RCS air interface.

From a user terminal perspective the majority of 1st generation solutions have leveraged existing DVB-S products and provided RCS functionality through programmable components. With the advancement of the specification, however, more integrated ASIC solutions have been developed that will be introduced into systems in 2002. This silicon has been developed with RCS as a key application but has not necessarily been developed solely for RCS.

The next generation of RCS silicon is already under development. This work has been undertaken given the signs that RCS will succeed as a standard. This silicon will implement the full specification and additionally use the feedback from 1st generation systems in developing the functional blocks. This silicon will likely meet 2nd generation of RCS equipment in 2003 and beyond. Like many standards before, RCS provides a means for further integration as the specification matures and the market volumes justify the cost.

Ultimately the goal of the OEM will be complete terminal units sold from the factory at costs below the threshold for a viable high-volume market. For now, most say the goal is in the range of 500 Euros for a residential unit. The use of DVB-RCS technology in digital TV/ Internet access convergence products will provide further volume opportunities for component suppliers and thus lower price points to the OEMs.

DVB-S POWERING
DISTANCE LEARNING

Students at the Sor Juana Inés de la Cruz school in Temascalapa, Mexico.

"Dear Mr. Clifton:

...I want to tell you that I am astonished by all the functions of los IDC (SuperFlex). With SuperFlex we receive a satellite signal and are able to watch educational videos about the Roman, Chinese and Greek civilizations, and the characteristics of living beings, among many, many other things. This is very nice and I hope that you continue inventing more technology for the distance learning communication for rural areas of the country and of all the world, so that all the children like me can learn more and better..."

Erika Nataly Pérez Islas

Letter from a student

Children in schools across Mexico enjoy access to a wider world of educational resources, thanks to the DVB-S technology of Canadian company International Datacasting Corporation (IDC). In business since 1984, IDC was among the first companies in North America to adopt the DVB standard. In 1997 IDC launched its SuperFlex family of products, which take advantage of the flexibility of DVB technology to combine data, video, audio, web pages, multimedia - any digital content at all - into a single DVB transport stream.

With Mexico widely regarded as the regional leader for distance learning The Secretaría de Educación Publica (SEP) along with the Instituto Latinamericano de la Comunicación Educativa (ILCE) produce and distribute 11 channels of educational programming distributed via proprietary video systems to more than 29,000 schools across the country. IDC was approached to help meet the challenge of distributing web content and digital files to schools unreachable by telephone lines and therefore excluded from Internet access. IDC did an overbuild-layering a SuperFlex system on top of the existing video system, using that uplink and receive site infrastructure. Schools are able to simply add one of IDC's SR2000 receivers, which connects via its Ethernet port to a single computer or a whole local area network.

In addition to the "SEC 21" programme providing basic learning support to rural schools, IDC's technology is used for programmes including adult continuing education, and RedEscolar (Mexico's "SchoolNet"). Also, IDC worked with ILCE to develop what is essentially a "video on demand" system for teachers who can select a video via a customised web page and have it

delivered over satellite, and built a state-of-the-art-teleport housed in the nation's national video library "VINE" in Mexico City.

"We are particularly proud of our work with Mexico's public schools where our receivers are referred to as simply los IDCs or the caja blanca [white box]" says IDC President and CEO, Ron Clifton, "but this is only one of many projects our team has carried out over the last few years. We also have systems in use for university and post-graduate level degree programmes, professional and corporate training, continuing education and telemedicine, as well as e-government. We have distance learning systems working across Latin America, in Asia, Europe, and around the world."

Michèle LeSaux, IDC's Director of Advanced Development concludes, "Our company is committed to open standards and our customers see the benefits. In an environment of cooperative and collaborative learning, it is the only strategy that makes sense. This system has become a model for the region and for the world."

A student watches a video on daily life in Southeast Asia. Computers are donated to schools from both the public and private sectors, in this case Ford Motor Co has provided a computer lab.

IDC's President and CEO Ron Clifton with Lic. Norberto Arturo García, teacher at the "Sor Juana" school. The school, which has no telephone is located in the "Rancho Las Pintas" in rural Mexico.

LIVE VIA SATELLITE
MHP

SkyLife, Korea's premier satellite operator, has launched the world's first commercial satellite broadcast of digital and DVB-MHP interactive television services. SkyLife selected Alticast to act as the primary solutions provider for their large-scale Digital Interactive Services deployment of the DVB-MHP platform. SkyLife's implementation represents the first commercial deployment of DVB-MHP services by a satellite operator, and is a milestone event for the widespread adoption of DVB-MHP.

Mr. Sang-Kyu Park, Managing Director, IT Business Group at SkyLife emphasises the significance of this deployment: "By deploying DVB-MHP interactive television services, we can now enhance our service offering to viewers with new interactive applications and take advantage of lower receiver costs and new revenue opportunities created by DVB-MHP, such as t-commerce and interactive TV shows."

SkyLife is deploying their digital television services in a phased approach. For phase one, SkyLife launched basic digital broadcast services in March 2002 to provide more than eighty-four video channels and sixty radio channels. With Alticast as the primary solutions provider, the deployment of digital interactive services kicks-off phase two of SkyLife's iTV implementation in June 2002.

Alticast was chosen to be the overall solutions provider for the digital interactive services deployment because of its comprehensive MHP solution that is readily available. Because the Alticast offering uses a widely adopted open standard platform, SkyLife can share and receive interactive services from content providers in Korea and other countries that use DVB-MHP or other standards.

Time to market is critical for SkyLife to win the satellite market in Korea. Alticast provides a highly experienced professional services team that drives the integration between multiple vendors involved in the SkyLife deployment to quickly deliver and deploy this large-scale MHP solution. Skylife plans to announce the commercial availability of digital interactive services to its subscribers in August 2002.

SkyLife also selected Alticast for the flexibility of its digital broadcast offering. Alticast is actively working with other vendors to provide SkyLife with an upgrade path to the MHP set-top box for personal video recording functionality. The upgrade can be accomplished via the over-the-air system upgrade.

SkyLife is one of the first service operators to deploy digital broadcast and enable subscribers to engage in DVB-MHP interactive applications. Shenzhen Cable TV, China's leading cable operator, is implementing a similar project, working with Alticast to deploy China's first interactive television services based on DVB-MHP. Both organisations are recognising that interactive services enable them to gain competitive advantages, benefit from cost savings and new revenue opportunities, and most importantly, attract and retain valuable subscribers.

WORLD CUP 2002

Scopus Network Technologies has selected Pixelmatrix Corporation's DVStation Monitoring Platform to monitor signal and image quality during the FIFA 2002 World Cup Football games this summer in Korea.

"Scopus selected DVStation's modular monitoring platforms because they provide the most effective and feature rich solution for analyzing several simultaneous MPEG signals in real-time," said Yehiel Keren, Scopus Professional Services Vice President. "FIFA's World Cup is the most sought after sports competition on the Globe and teaming with Pixelmetrix will provide Scopus with a more total

solution that holds with our digital broadcasting platform's reputation for quality and flexibility."

During the May and June games, Scopus will equip Korea Telecom with end-to-end digital broadcasting systems to transmit the events throughout the world. Twenty digitally-compressed channels will originate from each of the ten stadia across Korea where the games will be played. These live feeds will be transmitted via SDH links to the International Broadcasting Center located in Seoul. There they will be routed and re-transmitted via SDH links to three earth stations in Korea and then up-linked to

a satellite for broadcasting around the world.

The International Broadcasting Center will be able to simultaneously transmit 200 digitally-compressed channels. Transmissions from the location sites to the Center will be carried via an existing Korea Telecom optical link.

Scopus won the prestigious bid from Korea Telecom following the successful completion of extensive satellite and telecom network benchmark tests. Scopus is working with Samwoo Telecommunications Co. Ltd. and its representative in Korea, Dong-In Satellite Networks, to provide Korea Telecom technical support on site.

RESHAPING
BROADBAND SERVICES

DVB compliant satellite communication equipment manufacturer Newtec has recently completed the first 2Way-Sattellite Broadband IP-Access Network, based on the recent RCS (Return Channel via Satellite) standard, for its customer Aramiska.

Newtec together with its consortium partners Alcatel Bell Space and SpaceBridge Semiconductor Corp., with the support of the European Space Agency, has been able to develop and deliver the world's first DVB-RCS compliant Broadband Access Network in a record fourteen months.

Newtec's 2Way-Sat is based on a "turn-key" solution including the HUB station and Network Management as well as the Satellite Interactive Terminals (SITs) to be installed at the user's premises.

The first network system was delivered to Dutch based Aramiska, which started to deploy its services in the United Kingdom through its own sales force and installation team, with other European countries to follow.

The Aramiska network will dramatically reshape

EXPLORING
TV SERVICES

Scientific-Atlanta has announced its inaugural shipment of the new Explorer 8000 home entertainment servers, the world's first complete personal entertainment platform for cable, for customer trials.

The Explorer 8000 home entertainment server is designed to offer exciting new, next generation personal TV services. Consumers will be able to pause live TV, record one channel while watching another, record two channels and play back another simultaneously, and enjoy picture-in-picture on any consumer television set.

The PVR aboard the Explorer 8000 home entertainment server will be powered by an eighty gigabyte hard drive and will be capable of recording up to fifty hours of programming without the need for a phone line. With future added home networking capabilities, the Explorer 8000 platform will be capable of sharing a wide range of entertainment related content throughout the home such as video, music and digital images.

Volume shipments of the Explorer 8000 home entertainment server are expected to begin in June.

GETTING
TOGETHER

SES GLOBAL, Gilat Satellite Networks and Alcatel Space/SkyBridge have announced the formation of a 200 million Euro joint venture to provide two-way satellite broadband services in enterprise, consumer and SOHO markets throughout Europe. The new company was formed to meet the growing demand for broadband communications services in Europe via advanced Advantage Very Small Aperture Terminal VSAT satellite technology.

Building on a strong base in the enterprise market, the new company will expand into the residential market to meet the growing demand for broadband services in Europe, which it expects will increase at an annual rate of more than 30 percent over the next

five years. By 2005, approximately 8.6 million potential residential and SOHO users in Europe will still not have access to high-speed cable modem or Digital Subscriber Line (DSL) services, according to analysis by McKinsey & Company. This represents an important market potential for the new venture.

In the enterprise market and for some small and medium size enterprises (SMEs), the venture will offer complete satellite communications services. These services will be provided both directly by the new company and through wholesalers and will utilize Gilat's Skystar VSAT product, as well as SES ASTRA's Broadband Interactive System, which is based on the DVB-RCS standard.

THE INTELLECTUAL [PROPERTY] CHALLENGE

By Jud Cary, Assistant General Counsel, CableLabs

The DVB Project has made a call for declarations of intellectual property required to implement various DVB specifications, including the Multimedia Home Platform. The challenge to the industry is to establish an efficient licensing regime for implementers of the MHP and other specifications. To date, the DVB Project office has received multiple patent declarations. Additional declarations are expected as

DVB extended the deadline for submitting declarations to 31 May 2002. As discussed below, CableLabs, in May 2002, launched a similar effort for its OpenCable Application Platform (OCAP) specification.

The first step a company must take is to review their patent portfolio against the relevant DVB specifications. If a company believes they have relevant patents - that is, those which are necessary infringed when implementing a specification — they should submit a declaration, the patent, evaluation fee ($3500 per patent), and any other requested materials to the DVB Patent Coordinator, the law firm of Wilmer, Cutler & Pickering (2445 M Street, N.W., Washington, D.C., 20037-1420, USA. contact jryan@Wilmer.com).

Members of the DVB are required to license necessary intellectual property on fair, reasonable, and non-discriminatory terms. Such licenses can be royalty-free, or include a reasonable royalty. Sun, a large contributor to the MHP specification, has made arrangements to provide its intellectual property royalty-free to MHP implementers.

The DVB Patent Coordinator will perform an independent, objective analysis to determine if each declared patent is necessary for the implementation of the relevant DVB specification. All information regarding the performance of the patent analysis is kept strictly confidential. Once the analysis is completed, it is expected that the identity of the holders of essential patents, and other information, will be made available to the DVB membership.

Patent holders who are found to have necessary intellectual property are encouraged to create a "one-stop-shop" license, also referred to as a "patent pool." Patent pools offer an efficient mechanism for making necessary intellectual property available to implementers of DVB specifications. Patent pools are also efficient for the patent holders, because administrative, transaction, and other costs are shared, and kept to a minimum.

With respect to the DVB-MHP specification, the potential efficiencies are even more apparent. CableLabs, the US cable specification organisation, recently made a similar call for intellectual property for its OCAP specification. OCAP is largely based on the DVB-MHP specification. CableLabs will use the same Patent Coordinator as DVB. For the same patent evaluation fee, a patent holder will receive an analysis with respect to both the MHP and the OCAP specifications. It is expected that subsequent licensing can also be coordinated among the common patent holders, on the one hand, and MHP/OCAP implementers, on the other hand. Other countries or organizations that are considering adopting the MHP specification would also stand to benefit from a central patent evaluation, and licensing, structure.

Patent pooling and common licensing will fuel the widespread adoption of DVB specifications. DVB has been successful in facilitating the creation of other patent pools, including the DVB-T licensing programme. We expect that the industry will respond in a similar fashion, and DVB will have similar success with MHP and other DVB specifications.

For more information on the specifications covered by the call for declarations, see www.dvb.org. and www.cablelabs.com.

CONFORMANCE TESTING
THE MHP TEST SUITE

The MHP Test Suite consists of thousands of individual tests that determine conformance of MHP products. After successfully passing all tests in a self-certification process set-top-box manufacturers will be allowed to signal MHP compliance to the customer by using the MHP logo (fig. 1). Compliance with the standard is one of the fundamental prerequisites for interoperability between products in a horizontal market. Adequate testing is unavoidable for horizontal markets, however, MHP equally shows its strength and advantages for operators in vertical markets by simplifying creation, exchange and integration of interactive content and by lowering costs through strong competition.

The MHP Experts Group (MEG), a sub-group of the Technical Module, has been working on the collection, review and assembly of tests since early 2001 and is targeting mid 2002 for completion of the first MHP 1.0.2 Test Suite. Major hardware and middleware vendors have contributed tests for the development of the Suite especially in the areas of the standard which are not already covered by Sun Microsystem's

Dr. Ing. Rainer Schaefer was senior engineer in the New Services and Media Infrastructure department at IRT (Institut fuer Rundfunktechnik).

Since April 2002 he is head of the Production Systems TV department.

IRT is the Research and Development Institute of the public broadcasters in Germany, Austria and Switzerland (ARD, ZDF, DLR, ORF, SRG/SSR)

aspect of an API or of the MHP specification (a so-called "assertion") and then verify the correct implementation by running a small MHP Xlet that has been created after defining a strategy on how to test this assertion. Every test must show a clear "pass" or "fail". The Test Suite will be delivered as a set of Xlets, class files - including corresponding source code for debugging purposes - and other files that are usually broadcast to the MHP in a DSMCC object carousel, together with a common documentation and instructions on how to apply them.

Java and JVM tests were approved by DVB during the first "Request for Technology" (RFT) in July 2001 and are currently updated in order to reflect any recent decisions. Under the second RFT scheduled for the June 2002 meeting of the DVB Steering Board, another eight bundles containing several hundreds of tests for the remaining areas have been received and already mainly approved by MEG at the time of writing this article. Four further submissions or updates will be received, two of them being major ones. Other ongoing work is concentrated on increasing the depth and coverage of tests in these areas - especially for the HAVi APIs where tests already created by contributing members have been announced to the Experts Group.

The DVB Project Office is already preparing for quick packaging and delivery of the Test Suite to ETSI, where it will then be obtainable for an administrative handling charge of 1,000 Euros after signing an agreement. More detailed information on related contractual arrangements can be found in DVB's Blue Book A066.

Fig 1: Certification Process
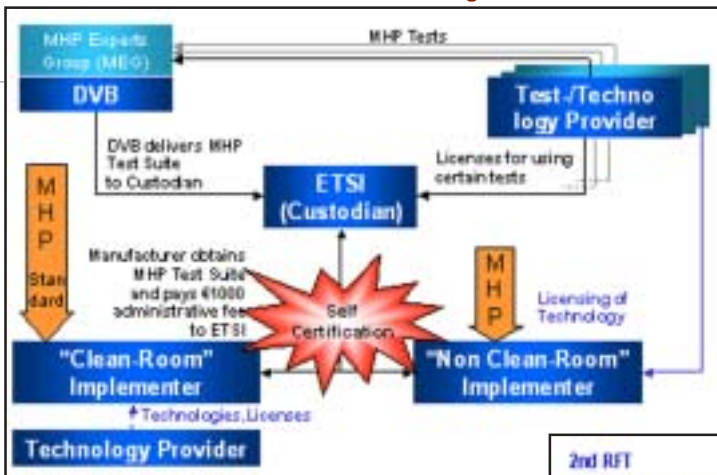
contributions. MEG is also responsible for maintaining the Test Suite with improvements and the extensions to other profiles.

The areas covered by the Test Suite (fig. 2) can be separated into a series of APIs (Java, Javax, DVB, DAVIC, HAVi) and into "basics" that are mainly related to more "human readable sections" of the specification and perform tests on e.g. graphics features or the application life cycle.

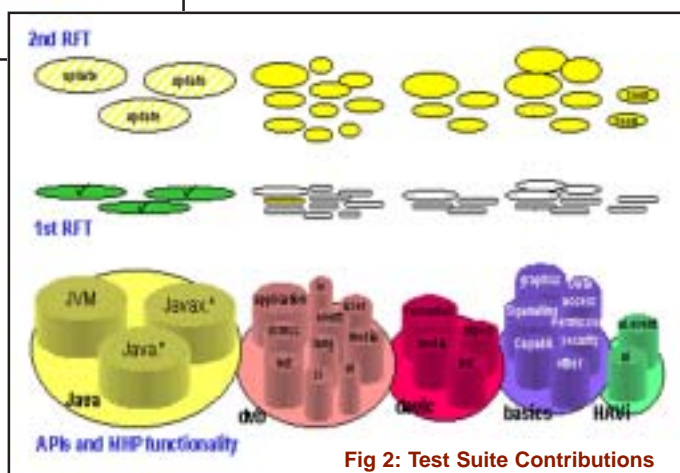The tests are typically organised to identify a small and single testable

Fig 2: Test Suite Contributions

Phil Sandberg is pretty sure he's the publisher of online technical library www.broadcastpapers.com and Asia-Pacific Editor of TV Technology magazine.

In My Opinion - Phil Sandberg

I WANT MY HDTV

It may not strictly be an example of Australia's post-WWII identity crisis, but the combination of a European technology (DVB-T) and American business model (HDTV) could be seen as fitting the bill.

When the Australian free-to-air industry announced its transition to digital would take the form of DVB-T HDTV services, the Americans (well, the ATSC) were disappointed and the Europeans thought they were all mad (obviously too much sun - and beer).

Of course, it was all a bit more complicated than that with different media organisations (both broadcasters and non-broadcasters alike) all jostling for different outcomes and a Government making regulatory concessions to everyone, yet satisfying no one.

HDTV was made mandatory for commercial broadcasters, while multichannel programming was forbidden (except in the case of multi-view coverage of sporting events, etc).

was the small problem that no one could see how they would make money out of being a datacaster.

Of course, there were also arguments raging over availability and affordability of receivers. With a DVB-T market in Europe less than enthused with high definition after the analogue HD debacle of the 1980s, some wondered what the point of adopting an international standard was if we couldn't take advantage of international economies of scale. After all, an HDTV, DVB-T receiver designed for use with 7MHz channel slots going to a market of 20 million people did seem like a bit of a custom job.

However, the $100 gazillion HDTV sets never quite materialised. Of course, big widescreen displays/sets range from £500-1000 right up to the price of a small, Japanese or Korean car, but we now have standard and high definition set-top boxes for around £300. And, despite being pronounced stillborn by the larger Australian newspaper groups

case with some European operators, meant they would have more freedom to experiment with content and how it is presented (even if they were not permitted to do so for a long period). In short, it helped "future-proof" their businesses and gave them flexibility.

And flexibility is what the Government seems to be exhibiting at the moment. At a recent conference hosted by regulatory body, the Australian Broadcasting Authority, Minister for Communications Senator Richard Alston outlined details of a Government review that could see multichannel restrictions relaxed and weekly quotas on HD broadcasts become annual quotas. The proposed changes would be part of an overall review, due later this year, of media policy that includes foreign and cross-media ownership, and rationalisation and digitalisation of the nation's cable networks.

So, as the process of digital roll-out continues to evolve down under, I suspect analogue switch-off, while

In short, it helped "future-proof" their businesses and gave them flexibility.

This allowed incumbent broadcasters to migrate to digital without threatening the fledgling pay-TV industry while regulators arbitrarily created the category of "datacaster" which prevented new entrants encroaching on the established FTA market via a complex list of genre restrictions.

Simple, except for the fact that no one was happy. A split in the free to air ranks (with more than one eye on future multichannel, possibly subscription services) led to the "triplecasting" scheme which required broadcasters to simulcast programmes in high and standard definition as well as conventional analogue. Then there

(you might remember them from the datacaster category), the digital roll-out continues to gather pace with a number of the larger regional centres coming on line and the major networks, most notably Network Ten, pushing the envelope in terms of MHP.

So what has HDTV meant for Australian broadcasters? Most important, whether some of them want to admit it or not, it has delivered bandwidth. Cooperating with the Government's requirement of broadcasting single, high definition programme streams allowed them to retain their full 7MHz channels. Not having to share a multiplex, as is the

inevitable, will be a little further down the track than most people first thought, but then again I suspect there are those in the UK having similar thoughts. Vale ITV Digital.

While there are those who think we should have waited, Australia adopted DVB-T as its digital terrestrial platform in 1998. With ISDB-T standardised a year later and China expected to announce its own digital standard next year, its probably good we didn't. European, US and Asian elements may go well in the mix of national identity, but with television I think we've given ourselves enough of a crisis.

TAIWANESE BROADCASTERS DISCOVER THE POTENTIAL OF DVB-T

Taiwan's decision in 2001 to go for DVB-T technology was generally a surprise as initially the country had favoured ATSC. Especially as Taiwan is the first country with analogue 6MHz bandwidth to have opted for DVB-T (also in 6 MHz). The main motivation for the operators in Taiwan to switch to DVB-T was the mobile application, which is seen as the application with the most potential for broadcasters in Taiwan to go digital.

In the first step of DVB-T implementation, three of the five private broadcasters CTS, CTV & TTV decided to go together for their procurement in order to optimise the information sharing and to get the best techno-commercial solution. As part of their pursuit for detailed information, a delegation from the three broadcasters visited Germany and had a detailed look at the network solution as well as the hardware available.

The detailed technical discussions and presentations were very extensive and interesting for both sides. Rohde & Schwarz had no reference in Taiwan and as such the technology was new for the country. Because of this all three customers had a to make the difficult decision to arrive at a conclusive choice of a hardware supplier. Eventually the excellent system concept, strong performance and strong references in DVB-T helped Rohde & Schwarz gain access into this very important digital market.

The broadcasters chose the Rohde & Schwarz NETLINK to provide remote control and monitoring over TCPIP/

SNMP and ordered a single unit for testing. One very important criterion that Rohde & Schwarz had to fulfil for this project was the very short delivery time, which was very critical to all three broadcasters. The operators wanted to go on-air by the end of April 2002, in order to complete their experience and proceed towards the network expansion.

As part of the project, Rohde & Schwarz undertook to deliver 2.5KW & 1.3, 4KW liquid cooled transmitters together with training, installation and commissioning. Rohde & Schwarz successfully performed the training and the technical acceptance procedures during February 2002. The goal of Rohde & Schwarz was to get the transmitters on air by end of April and to provide the best possible support to the broadcasters in Taiwan. Currently the operators are looking to get the network planning in place for a nationwide SFN network. Although to

date the final structure is not clear, the operators are looking at the possibilities of sharing infrastructure especially on the antenna side. The issue of sharing the multiplexers is not yet very clear. In total, with the five broadcasters put together, it is expected that about 10 to 15 TV programmes would be broadcast in Taiwan.

It is expected that the SFN coverage for the nationwide network, which is already underway, should be completed by end of 2003. The final target, as seen now, is to achieve SFN with mobile applications and in future the support data applications. All in all, the progress so far towards DVB-T in Taiwan has been very rapid. It is the hope of all the operators that the benefits provided by this new technology will be appreciated by their viewers, which will certainly make this new venture a technical and commercial success for the operators.

UK TRIALS MOBILE DIGITAL TV

NTL Broadcast has successfully completed UK tests of mobile digital terrestrial television (DTT) proving that consistent high-quality video, audio and data can be received in moving vehicles using existing frequency spectrum. The work follows NTL's building of the world's first commercial mobile digital TV network in Singapore last year, which provides a service to video screens installed on public transport.

Using a rugged form of the established DVB-T transmission format, digital terrestrial television has the potential to offer perfect pictures on the move. This unique feature allows applications that

could increase the scope of the digital terrestrial platform for broadcasters and viewers alike.

In the UK trials, which took place in the Oxford area over the last few months, a multi-channel service was broadcast over a single-frequency network. This was received in a vehicle equipped with seat-back TV screens, demonstrating excellent picture quality and signal robustness. Different transmission modes were evaluated and the performance of various demodulator chips was assessed in order to identify those most suitable for use in mobile receivers. The trials confirmed that lower data rates delivered the most

robust signals. However experiments also showed that reliable reception could be maintained at higher data rates with increased transmitter power.

Steve Holebrook, business director for media solutions at NTL Broadcast, said: "This initiative opens the way for development of the DTT platform. It's important that we explore this developing technology to show what can be achieved in mobile TV with relatively little frequency spectrum. There is considerable interest world-wide. The mobile audience is an untapped market for TV delivery and one which only digital terrestrial broadcasts can readily fill."
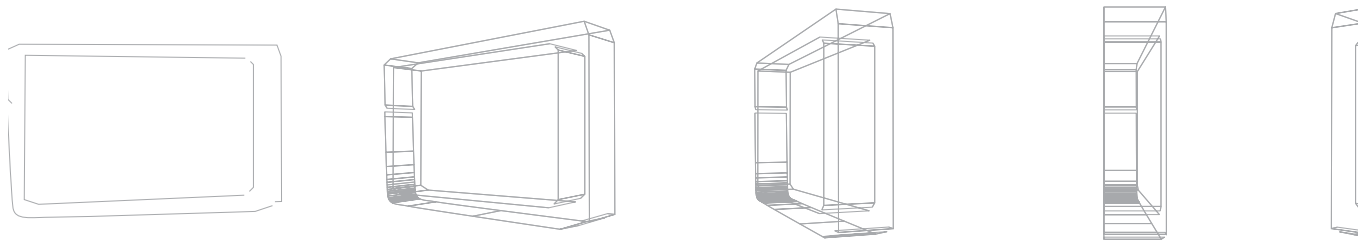
PRODUCT BULLETIN

DVB Scene takes a look at some of the offerings from DVB members

Continental Microwave has announced details of its full featured compact digital microwave transmitter that uses fully integrated MPEG-2 compression and DVB-T (2k) COFDM modulation for exceptionally robust 'on camera' transmission in live ENG, studio and OB applications. The Reporter Series transmitter is both compact and lightweight at under 1.5kg and is available with options for direct camera mounting and backpack/beltpack configurations.

Reporter Series Transmitter

The company has also launched its CDX-T, a broadcast quality MPEG-2 encoder combining the features of an encoder, satellite DVB-T modulator and satellite upconverter in a compact 1U rack mount unit. Specified for rugged operation in temperatures -10 to +50 degrees Celsius, the unit is ideal for flyaway and mobile DSNG operations as well as main earth stations.

Harris, through its ITIS Products group, has launched a 50W version of SPOT, its intelligent repeater designed for gap filling. SPOT receives an incoming digital broadcast, then decodes and recodes it before transmitting it, ensuring signal integrity, and far higher resilience than a simple analogue repeater.

IBS is a corporate DVB-RCS solution from **ND SatCom**. This network infrastructure is more finely tuned to the corporate VPN market with up to 5,000 terminals per hub or even beyond. Here the DVB-S carrier would scale between 2 and 38 Mbps transmission. The hub supports multiple transponders which can span vial multiple satellite transferring data in IP over DVB-S format. The SITs themselves are able to transmit back to the hub at up top 2 Mbps (MF-TDMA capacity assignment). To date, ND SatCom has partnered with Raytheon in the development of terminals and is completing development of an integrated POP concept to permit customisation of a service offering via add-on router capabilities integrated into the IDU. The feature set of the integrated POP includes remote access control, a TCP PEP (including data compression capability) a DHCP server, a full NAT implementation, covering all translation variants and allowing a flexible interrelationship with the NAT capability already included in the hub, plus a full router with IP/Sec authentication and encryption functionality. Raytheon and EMS supply the IDU portions of the terminals.

Adding to its DVStation product line, **Pixelmetrix** have introduced the low-cost DVStation-Pod, a complete single-channel preventative monitoring solution. Available in three configurations, it can be used for integrating, installation and troubleshooting in digital television facilities. The system is targeted at satellite, cable and terrestrial broadcasters.

DVStation-Pod

Also new to the Pixelmetrix DVStation product line is TS Capture with On-Board Playback. The Transport Stream module allows the operator to capture up to 96MB of the stream whenever an error occurs. Once captured, the data can be played back for review, thus helping engineers locate problems quickly without having to depend upon costly external test and measurement equipment to evaluate the data.

Scopus Technologies has announced an addition to its CODICO product family with the RTM-3300, a 10-input, compact 1 rack-unit, DVB Statistical Multiplexer / Re-Multiplexer and transport stream processor. The RTM-3300 is intended for medium size head ends and digital turnaround applications. It is also suited to operate in instances in which broadcasters do not require excessive capacity such as multi-channel DSNG and DENG applications.Options include a built-in DVB scrambler or can also be supplied as a standalone DVB scrambler.

Sofia Digital is now offering a benchmark application for testing MHP terminals as part of its service portfolio for MHP set-top box manufacturers. The goal of using the benchmark application is to evaluate the performance and test the functionality of different MHP terminals. It measures the processing power and graphics engine speed. It evaluates font support, support for I-Frames, and other image formats as well as video scaling.

The company has also announced its launch of Backstage Publisher for managing iTV services using MHP. Designed to control the content of iTV services on any object carousel. The system enables an object carousel to add iTV services to the broadcast stream to be received with the video stream on a viewer's TV.

Tektronix has introduced a handheld waveform monitor for broadcasters, network operators, and content providers that need a fully portable instrument that can monitor both digital and analogue signals from a single tool. The WFM91D is a handheld, battery-powered, composite analogue
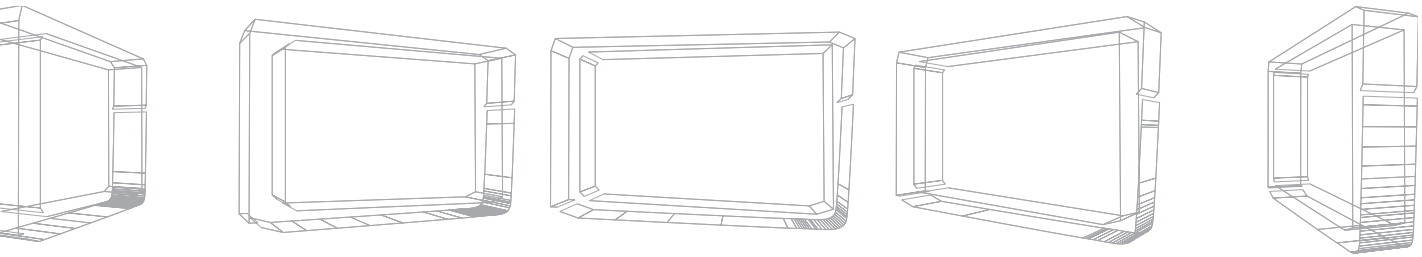
WFM91D

and SD-SDI component digital waveform monitor that provides flexibility, portability, and powerful monitoring to users dealing with equipment installation, maintenance, and field production.

Tektronix has also launched a portable MPEG testing device that provides a first line of defence in analysing MPEG-2 transport stream formats. The AD920 is a handheld, battery-powered MPEG transport stream confidence tester that reduces downtime, provides faster installation time, and quickly identifies faults to help ensure quality and reliability in networks that distribute video, audio, and data in digital formats, including DVB.

DVN Technology Limited is now offering J-Box, a digital cable receiver. J-Box works like a client server and only downloads appplications when needed and stores only those that are frequently used.

J-Box

Also now availabe is JetCAS, the company's fourth generation DVB compliant conditional access system

that has been designed to give TV Operators the security, flexibility and control over the distribution of digital content and t-commerce applications. The system is based on smart card technology featuring dual layer security.

Motorola has expanded its digital product family with three new DVB compliant set-top boxes. The DVi1000 is for enhanced broadcasting on DVB-C with more programming channels and subscriber benefits. The DVi3000 provides expanded channel capacity, virtual channels, and hyperlinking capabilities, as well as supporting real-time reverse-path communications, providing a gateway to interactive services such as video-on-demand, thin-client TV-based Internet, and electronic programme guides. The DVi3500 is an advanced-interactive DVB-compliant digital decoder with an integrated modem.

DVi3500

Sagem has launched four new set-top boxes. The Sagem PVR 5000S Personal Video Recorder satellite series designed for digital quality reception and recording of unscrambled and encrypted satellite TV programmes that can record up to 40 hours of programmes on its integrated 80 GB hard disk. The Sagem IXD500 for satellite, cable and terrestrial television operators who want to carry out mass digitisation (conversion of analogue subscribers) at minimum cost. The Sagem ADSL5000 is for the reception of programmes broadcast over the ADSL network. And finally the Sagem ICD 5600-RC cable set-top with an integrated cable modem that makes it possible to receive wide band and backward channel services (fast

Internet, sound and video streaming, on-line shopping, interactive games, etc.) provided they are offered by the network operator.

Scientific-Atlanta claims its new Explorer 2200 and 3200 digital interactive set-tops deliver increased performance for interactive TV services in a footprint significantly smaller with innovations and improvements such as improved speed and performance with a powerful 166MHz, 32-bit RISC processor. Many of the set-top functions, such as graphics, are processed via dedicated integrated circuitry and not via the CPU, leaving more of the CPU's power available for digital services.

Viaccess SA has introduced Viaccess-Net, a scalable conditional access system for content distribution over IP. It allows for the secure delivery of multicast and unicast content on all IP network architectures (satellite, cable, terrestrial, xdsl, LAN/WAN) and offers a way to secure and manage access to many push services on the Web such as video or audio streaming and file downloading.

The company's new MediaSuite-KV is an end-to-end content management solution that enables providers of video over IP services to encode, enrich, plan, publish and distribute their content to the consumer, while controlling access and managing contractual rights along the whole value chain. Media-Suite-KV runs on any IP infrastructure (proprietary operator network, Intranet or Internet) and delivers content to any IP receiving device (TV & set-top box, computer, PDA, mobile phone).

AUSTRALIA IN THE PICTURE
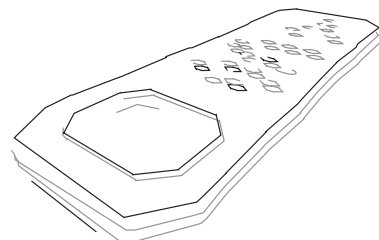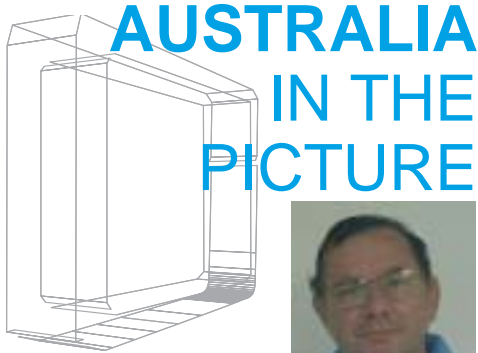
John Bigeni reports

Australia commenced implementation of DVB based digital terrestrial services over a year ago and this implementation process is proceeding on track. All capital cities are now provided with free to air commercial services as well as services from the government funded stations of the ABC (Australian Broadcasting Corporation) and the SBS (Special Broadcasting Service). Some major regional centres have also come on stream and implementation to other areas will gradually continue until 2004 at which time most areas will be covered. The most recent commissioning occurred in Newcastle where test transmissions commenced early in April.

Programming has been largely limited to the replication of programmes available on the analogue channels and therefore there has not been any great attraction up until now for people to invest in digital receivers. Some changes however are occurring which are starting to stimulate the market. Indeed High Definition transmissions are becoming increasingly available and coupled to the availability of affordable HD decoders and general digital awareness, receiver sales are on the way up.

According to Digital Broadcasting Australia (DBA) Industry sources report in January and February 2002, sales of widescreen TVs were up 700% from the same period in 2001 (albeit from a low base). It is currently estimated that over 50% of prime time digital programming is available in 16:9 widescreen format. The price of converting to digital is also far lower than expected 12 months ago - a widescreen TV with a digital set-top box is now available for as little as $1,600. Despite the initial low level of sales, set-top boxes to receive Standard Television have reduced in price by up to 50% in just less than 12 months. It is believed that such reduction is attributable to the economy of scale that comes with the DVB system - it being now implemented in other countries around the world. Many such receivers are now being sold simply because it has been found that this is a cheap way to fix unsatisfactory reception of analogue signals because of multipath. DVB-T eliminates such reception errors.

Other programming initiatives which are likely to effect digital receiver growth is the improvement to programming. This includes the provision of special digital channels. The ABC for instance has already introduced a twenty-four hour children's channel and other digital offerings are in the pipeline. Consideration by the government is also being given to allow commercial channels to go to multichannel operation. This is currently not allowed under the existing licensing regime.

Interactive services are the next focus and may prove to be the crucial element in the broadcaster's business model. The industry has opted to adopt the DVB-MHP (Multimedia Home

Platform) standards in this regard. It is understood that several experimentations are taking place.

One of the more significant developments is the testing of hierarchical modulation to increase the service options available. This DVB based technology can effectively provide within the one transmission channel two quite separate bit streams each having distinctly different characteristics. For instance, it can provide an HDTV service to fixed receivers whilst at the same time provide a more robust but lower bitrate service to a mobile receiver population. This can be a standard definition service for portable and mobile receivers or indeed a multiplex of data or other products. No specific announcement has been made regarding service intentions but it is understood that the tests were extremely successful. Clearly, the Australians are doing some groundbreaking work in this area.

NEW MEMBERS

Agfa Monotype Corp.

Broadband Wireless Association

Canal+ Technologies

DemoGraFX Inc.

gcs-Global Communication & Services GmbH

Groupe Canal+

Harmonic Inc.

Infonova

International Datacasting Corp.

ish GmbH

Korea Digital Satelllite Broadcasting

(Skylife)

MPEG L.A.

MTV Oy

NSI Communications Systems Inc.

NxtWave Communications Inc

Optus Television

Pixelmetrix Corp.

SIDSA

ViXS Systems Inc

Vodaphone

Xantic

Zentek Technology Inc.

2Way-Sat

Satellite Interactive Terminal

DVB-RCS Compliant
Broadband IP- traffic
Suitable for Ku & Ka Band
Ethernet LAN Interface
SNMP supported
Easy installation &
set-up

2Way-Sat
by
Newtec