



Asia-Pacific
Broadcasting
Union

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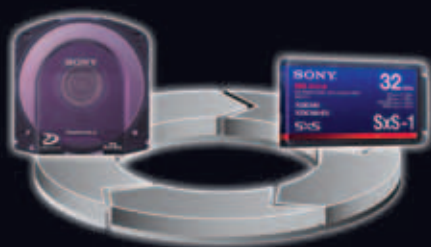
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Asia-Pacific Broadcasting Union

TECHNICAL REVIEW

From the Editor's Desk



This edition leads with a report on the ABU Digital Broadcasting Symposium 2012. Exceeding all expectations, the event attracted a large numbers of delegates and industry players. The event involved conferences, parallel workshops, exhibitions and webinars.

Three technical articles for this edition have been contributed by British Broadcasting Corporation (BBC), Turkish Radio and Television (TRT) and Bhutan Broadcasting Service (BBS). The BBC article highlights the need for innovation in supporting multi-platform delivery and describes the role of IT based systems and commercial data services as an essential part of delivering media services.

The article from TRT defines the development of the radio automation system in that organisation.

The BBS article describes the improvements in broadcasting systems, startup of a new TV channel and the future plans and challenges of broadcasting in Bhutan.

The current issue also includes reports on the 8th Global Coordination Conference, PMP Conference, WRC-12 Conference and an HDTV workshop in Ankara.

In addition there are our regular features, news from the region, updates on digital broadcasting and new broadcasting equipment.

The Asia-Pacific Broadcasting Union (ABU) is a professional union of broadcasting organisations in the Asia-Pacific area which aims to co-ordinate and promote the development of radio, television and allied services in the region. It is non-governmental, non-political and non-commercial.

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Technomedia Solutions Pvt. Ltd. incorporated in July 2002 offers total consultancy, turn-key solutions, professional services, new & innovative customized solutions and products for the Electronic media industry. Technomedia also provides IT enabled solutions to media houses. We are one of the leading end - to - end system solution providers in India for radio and television media industry. Our strength lies in our expertise.

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» Music Select

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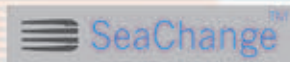
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Delivering Leading Edge Services in A Competitive Market

by Nigel Fry
BBC Global News

Introduction

Engineers have a key role to play in delivering innovation that enables revenue growth and maintains the competitive position of our companies. This paper considers both the process through which innovation can support multi-platform delivery and also the need for the predominantly IT based systems to work consistently and reliably. Achieving high levels of availability using commodity IT products and commercial data services is an essential part of delivering media services. Some of the approaches to achieving this are considered.

Innovation

The media industry is dependent upon two key resources, the talent that produces great content and the technology used to produce and deliver that content to the audience. As engineers we are the talent behind the technology and today as ever our role is vital in ensuring that the services we support are delivered efficiently and effectively to the benefit of the 'businesses' that employ us. Whether the business is for profit or for public service should make no difference, after all, the audience choose to watch or listen to the channel based on the content and the synopsis, not the channel's business model.

Competition in the media market comes from many quarters. The rise in consumption of IP delivered services provides an additional dimension for broadcasters to manage. It creates new opportunities for delivery of services to market (the 'audience') whilst at the same time threatening more established platforms such as satellite and cable. Total advertising spend remains roughly constant but is now spent across more platforms with potentially less available for the traditional platforms. As Engineers we must provide systems to support this increased diversity of delivery methods with no significant increase in operating costs.

The method by which a consumer accesses content, be it clips, complete programmes, streamed or broadcast services, is likely to be dependent upon their location, be it a shopping mall at lunchtime, or relaxing at home in the evening. In most cases they are likely to be unaware of the means of delivery. To the broadcaster this demand to support many platforms must be serviced with little or no extra resource. The use of automated processes

provides a good way of ensuring the complex processes and the multiplicity of instructions required to support these platforms are executed consistently and reliably.

Through innovation our objective is to deliver more for the same cost or the same for less cost. A simple example of the latter is available in the field of satellite distribution, where new MPEG coding systems can reduce the data rate of the DVB bit-stream required to deliver a TV service. Other examples of innovation can potentially seed many products. In particular the integration of scheduling and automation systems can be exploited to provide a system that can automatically deliver programmes and content to many platforms from a single schedule. Whilst the tools for scheduling have been widely used for 15 or more years, the use of these or similar tools to manage workflow is a more recent innovation. It is the management of workflow that ensures the processes required to support a variety of services, whether defined by language or by platform, can be tracked effectively and efficiently by 'network managers'. Examples include the preparation of subtitles for programmes being broadcast in other than their native language or the requirement for a programme to be delivered to an On Demand platform after its first airing. The scheduling system is often the tool used to capture the metadata whether relating to the content or to the time and method of broadcast or distribution. Scheduling systems tend to be used up to 24hrs in advance of transmission and other tools may be required to support changes to 'live' material or for breaking news events.

The specification process; the mapping of current business processes or constructing a model based on best practice, is critical to achieving the desired system functionality and fit with the business process. The older an organisation (and the more it is set in its ways), the more difficult this can be. With BBC World Service we had a process that had evolved over many decades to be capable of producing the multi-dimensioned schedule needed to produce networks, distribution networks and the transmitter schedules. Considerable investment can be required to complete this specification process, mapping of business processes, use cases and building data models.

The products of the process are the documents needed to configure the business systems. This is incidentally a process and procedure that can be invisible to many colleagues

and certainly one that needs to be carefully explained and illustrated, in particular to ensure that expectations about what can be achieved and in what timescale, are managed. From these documents the important test scripts can be produced against which the systems will be exercised prior to service. Additional staff may be bought in to perform some of this process, however to ensure that future changes can be delivered the knowledge needs to be retained in the business by training of existing staff or engaging a business analyst who will continue to be associated with the business. Experience shows that demands of the business can create a need for continuous change and development. Such demand shows no sign of abating as media markets continue to evolve and we continue to need to satisfy the requirements of emerging platforms.

Whereas some years ago broadcasters may have written and operated their own software, most of us now buy products from the industry. One challenge of operating commercially produced software is managing the version control cycles. The inherent conflict or race between the supplier releasing new software versions to provide new functions and take account of different client requirements and the broadcaster's need to test and regression test a new version to ensure it meets their own specific requirements. It is a fact of life for us, something that has to be mitigated but can never be resolved. I would suggest that even if scheduling products could be acquired as Cloud Services, there would be no less demand on the Engineers to manage version control to ensure reliability and performance are maintained.

We will see later how the need to maintain main and reserve, or online and offline systems, is critical to achieving the required levels of operational service. The reserve system and ideally a smaller but similarly configured test system provide the environment in which developments can be exercised first and shown to the operations team. Access to the test environment allows 'super-users' to experience developments first hand and conduct thorough testing of the system prior to being loaded onto the offline server environment. Overall this process can take many months and it is at this stage where confidence is established in the performance of new developments, safely isolated from the day to day business environment, in readiness for being taken online. We operate a structured change control process modelled on the ITIL¹ methodology, this ensures that all parties are familiar with the proposed change and have consented to its implementation prior to service.

Service Delivery

With good design, good implementation and support reliable database and server systems can deliver 99.999% (five 9's) availability. However faults are likely to take longer to fix than with non IT systems and hence it is essential to have resilient systems to minimise the downtime of the channel.

Achieving high levels of availability requires both a well engineered infrastructure and appropriate maintenance. Good maintenance programmes for the databases and server systems are at the heart of these operations. Two important elements of this are well trained staff performing processes to a defined maintenance schedule and good monitoring of systems performance to address any short comings before they affect the service.

The way in which operations teams respond to issues is equally important. Very reliable systems can encourage complacency and it is important that the operational and support teams are well practised on how to respond when incidents do occur. Do they know of planned maintenance by partners, or how to ensure that the standby systems can be brought into service? Do they test the alarms by failing key components? Are they aware of the power supply arrangements for their building? We have found that it is not unusual for control room based operational staff to have little knowledge of the power systems on which they are so dependent. It is important to not just define processes for dealing with incidents but to test them to ensure that all staff can respond confidently to incidents.

Such regimes do not require large teams to support them. A key factor in sizing the team is the rate of change and development. Staying at the leading edge requires experienced staff to be available to support this change alongside 'business as usual'. With good system design and configuration, the operational teams (working a shift pattern) can maintain a 24/7 service with the system support specialists working normal days. In this way it is much easier for the support team to accommodate projected demands of training and supplier meetings. Even the smallest teams should always try to have individuals allocated to either project delivery or operational support, the response required and the approach needed in each area being quite different.

We are all likely to have service partners supporting our business either upstream or downstream (between us and the audience). The relationship with these partners and their performance is critical to ensuring that our services reach the audience reliably and consistently. Good customer service skills and a good understanding of broadcasting are essential. This together with defined and agreed protocols for managing incidents help to ensure that our own operations teams are immediately informed of outages, kept informed of resolution process and then receive a full incident report within 24hrs. A good example is provided by one of our suppliers that has monitoring systems which very rapidly confirm issues that have been detected by our own equipment. Typically they will be calling us with an issue at the same time as we are cancelling our own alarms. One challenge we face is to ensure that those supplying data or satellite comms. services understand the broadcast market and the expectations of the audience. Taking circuits down in the

¹ ITIL – Information Technology Infrastructure Library – A UK Govt backed methodology for the structured management of IT based environments.

evening to work overnight with further interruptions to service might be OK when supporting business data-comms. but is not at all good for a broadcaster at peak viewing times.

Our own business needs global connectivity that is available '24/7/365'. As Engineers we cannot avoid outages, however we can use processes and systems to mitigate the impact of an outage. Good monitoring and automated alerts in

the event of faults helps to manage the expectations of our colleagues. We should be confident that we know how to respond to an incident whenever and wherever it may occur and that the service will be recovered, that we can report confidently on the incident, the response, any lessons learnt and the changes we may need to make to prevent re-occurrence. Through such behaviour we will achieve the best service we can and maintain it to the best level.

author



Nigel Fry
BBC Global News

Nigel Fry is Head of Distribution for BBC Global News. He has responsibility for the processes and systems used to aggregate and distribute globally, BBC World Service and BBC World News programmes. BBC Global News broadcasts in 28 languages and reaches an estimated audience of 225 million people each week. Programmes are distributed globally to many thousands of locations for broadcast by partners or from BBC World Service's network of high power and low power transmitters. Much of the current business activity is performed through major outsourced contracts.

The views expressed in this article are his own and may not reflect those of the BBC.





Innovative Solutions from Concept to Commissioning

About Us

BECIL a profit making Government of India, PSU established in the year 1995 provides consultancy and turn-key solutions in the Broadcast Engineering and IT related fields. BECIL has a pool of in-house specialists and vast reservoir of experts drawn from various fields of broadcasting including Radio and Television. BECIL works on national & international level. BECIL advises MIB and TRAI in various broadcasting related policy matters.

Our Services

- Establishing Radio & TV Transmitting facility including frequency and coverage planning, prediction etc.
- Setting up state-of-the-art studio facilities for Audio & Video including Ethernet connectivity capable of transmitting live content and data.
- Establishment of Cable TV systems and HITS (Head End in The Sky).
- Custom design of interiors and acoustics of conference rooms auditoriums and broadcast studios to confirm international standards including evaluation and advising corrective measures.
- Turnkey Solution for Establishing Community Radio Stations.
- Electronic Media Monitoring solutions (Radio & TV Terrestrial or Satellite) and

- security related Surveillance Setups for GSM, CDMA & VSAT.
- Sales and support for all type of broadcast engineering equipments/system.
- Design and integration of outside broadcast vans (DSNG) with state-of-the-art technology.
- Providing professionals for O&M of broadcast stations, TV studios, satellite earth stations, Electronic Media Monitoring Center.

Major Achievements

- Establishment of Multiplexed FM Transmission at 87 centres across the country for 245 Private FM channels of Phase-II scheme as System Integrator.
- Revamping and Restoration of Print Media, Radio and Television Network in Afghanistan.
- Design and establishment of State of the Art Electronic Media Monitoring Centre for 24x7x365 monitoring and logging of 300 Satellite TV channels.
- Involved in setting up of 16 out of 22 Private FM Stations that have come up in India in FM Phase-I and all 245 stations in Phase-II.
- Designed, integrated and supplied Ku/C-band vehicle mounted DSNG Van to Doordarshan India.
- Installation & commissioning of 160 Cable Head Ends in the difficult terrain of NE Region for Doordarshan India.
- Supply & commissioning of GSM / CDMA surveillance system to Haryana Police, Assam Rifles and Assam Police.

- Supply of security equipment like Laser Range Finder, Non Linear Junction Detector, Real Time Viewing System, VSAT Monitoring etc. to Para Military, Military, State Police Depts. Etc.
- Establishment of TV studio for IGNOU, Edusat setup for Delhi Technical University and Sangeet Natak Academy.
- Operation & maintenance of studios & uplinks for ANSSIRD, Mysore, CES IGNOU, New Delhi, SRSAC studios & Earth Station at Jaipur, TV studios of RCI, New Delhi, TV studios of IGNOU, New Delhi.
- Manpower outsourcing for specialised service to Doordarshan and AIR News Unit Delhi, RNUs and EMMC.
- Establishment of much applauded Main Press Centre of Commonwealth Games 2010 for PIB.
- Designed and created broadcast compounds & facilities for Prasar Bharati, the host Broadcaster of Commonwealth Games 2010.

On Going Projects

- Supply & installation of studios production equipment for Bangladesh TV for an amount of US \$ 2.1 Million.
- Supply & commissioning of 2 nos. of 1000 kW MW AM Super Power Transmitters to AIR for their external services.
- Upgradation of T.V.Studio at Jamia Millia Islamia University.
- Providing additional facilities in Lok Sabha T.V setup.



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8th Global Shortwave Coordination Conference

The 8th Global Shortwave Coordination Conference was held from the 9 – 13 January 2012 in Kuala Lumpur. Almost 100 frequency managers, representing 50 broadcasters from different countries, attended the conference. The Global Coordination meeting is the joint meeting of the three coordination groups, HFCC from Europe, ASBU from the Arab States and ABU-HFC from the Asia-Pacific region. Together these groups comprise around 90% of the world's shortwave radio broadcasters. The joint meetings are held once every year and are hosted in the Asia-Pacific region every other year. The three Groups, as a whole, deal with reduction of interference affecting frequency channels used for around 7000 shortwave radio transmissions put out by the broadcasters every day.

This was the fourth time the Global Conference had been held in KL. At each conference, frequency requirements for the over 7000 daily transmissions had been considered and it was noted that, over the years since the first conference, interference had now been eliminated from a large number of them. With this accrued improvement in interference it was becoming increasingly difficult to effect further reductions.

Speaking at the opening session of the conference, Oldrich Cip, who chairs the High Frequency Coordination Committee (HFCC), said that new media technology had never replaced an old one, and that all technologies were capable of existing side by side. He also highlighted that shortwave frequency management and coordination remained the core activity, as supported by the International Telecommunication Union.



The Steering Committee of the ABU-HFC Group had two sessions during the conference. The Steering Board believed that shortwave should be considered alongside internet radio. In this, Gary Stanley expressed the opinion that the horizon of shortwave meetings should be expanded to include other international broadcasting activities, such as the internet and digital developments. He also said that, since the HFCC made all the schedules public, the HFCC website should be the one-stop place to view all schedules for shortwave and other international broadcasting activities, including internet.

The ABU-HFC meeting decided to send relevant monitored audio files to FMOs who were unable to attend the coordination meetings.

The five day conference also included meetings of associated groups, including the Group of Experts (GOE), Joint Steering Committee and the meeting of the ITU representative and Arab States Broadcasting Union (ASBU).



DIGITAL BROADCASTING SYMPOSIUM 2012

“Decision time for Stakeholders”

The 2012 event of the ABU Digital Broadcasting Symposium was held from 9-13 March 2012 in Kuala Lumpur. It was the eighth such symposium organised by the ABU and carried the theme “Decision Time for Stakeholders”. The event attracted over 1000 participants, representing broadcasters, regulators, policy makers, manufacturers, service providers and other industry players.

The composite 4-day event included a 52 booth exhibition and focused workshops and conference sessions, addressed by over 90 eminent speakers. The conference and workshop sessions provided, among other topics, information on the advantages of implementing digital technology and services.

Opening

The 2012 ABU Digital Broadcasting Symposium commenced on 6 March in Kuala Lumpur. The opening day saw eight workshops presented to more than 400 participants from ABU members, equipment manufacturers, system integrators, service providers and representatives from other sections of the broadcasting and associated industries.

As was customary, the DBS conference commenced with “Perspectives,” presented by a media personality, providing a non-technical viewpoint on technological developments.

In his welcome address, the ABU Secretary-General said that new technologies brought with them several complicated issues and that it was for the stakeholders to take appropriate decisions so as not to be left behind in the marketplace.



and Culture, Malaysia, Y B Dato' Joseph Salang. In his address the Hon. Deputy Minister said that audiences were now demanding diverse types of content on the platforms of their choice, yet meeting these requirements would not have been possible but for advances in broadcasting technology. He added that however, it was important that broadcasters met the challenges and made good use of the opportunities offered by the new technologies. He said that many countries in the region, including Malaysia, were keen to implement the digital technologies to enable their audiences to reap the benefits of digital services.



Industry Keynote

The Industry Keynote was presented by Mr Brett Savill, Director of Strategy and Corporate Development of Broadcast Australia. He said that the theme of the Symposium, “Decision-time for Stakeholders,” was the right one for 2012 and he suggested that one of the things preventing broadcasters from realising their vision was having to cope with the growth and complexity of content delivery.



Ministerial Address

The Ministerial Address followed the first Session of the conference and the ABU Secretary General welcomed the Hon. Deputy Minister of Information, Communications

Presentation of Life-time Achievement Award

It was announced that the special lifetime achievement award was being made to Mr Doan Viet Trung, the Vice President of The Voice of Vietnam (VOV). Mr Trung, it was said, had been working with VOV for more than 20 years and that he had provided leadership in setting up and expanding VOV's radio and TV broadcasting network in Vietnam. He had initiated the introduction of new technologies and new media in VOV, including a traffic channel and news webcast. The award, presented by the Hon. Deputy Minister of Information, was received by a colleague, on behalf of Mr Trung.



Mr Tung (right) receiving the award

Systems Standards: New Features and their Evaluation

The first session looked at recent enhancements in digital system standards and emerging new standards, their features and applications. The presentation on 'Standards Selection and Evaluation' addressed the need for standards. Digital system standards used in industry are evolving with enhancements to keep in step with advances in IC chip architecture and R&D work progress in broadcast, communication, computer and IT. Selection of the appropriate standard depends on market drivers together with techno-economic, policy and cost issues. Like broadcast delivery, standards require field tests to validate performance and feasibility, as well as trying ways of reducing capital and operating expenditure.



Ruxandra Obreja

The DRM+ standard has been endorsed by the ITU and, with this, DRM standards now cover all bands, up to and including VHF. Looking at recent developments, India, Russia and Brazil have enhanced their engagement with DRM30 and DRM+, thus becoming key players. Tests have been completed in other countries including the UK and Italy. New receivers are coming into the market, as seen at IBC 2011, and more are expected at the coming NAB. A sizeable number of AM transmitters in Russia, India and other countries are being replaced with DRM transmitters.

DVB-T2 is promoted as being environmentally friendly with better efficiency. Compared to DVB-T, the current standard provides for more services per channel while operating at a lower transmitter power, resulting in more cost effective operation. With receiver prices falling rapidly the take up of the standard is increasing worldwide with many countries in this region already adopting DVB-T2.



John Bigeni

The take up of DAB/DAB+ and DMB standards is increasing on five continents. A major driver for this is that as



Jorn Jensen

significant number of cost effective receivers is available, including mobile devices. The car industry has also realised the potential of DAB+ and it is becoming evident that digital radio, with its clarity, interactivity, value-added services, reduced capex and efficient spectrum use, is the future of radio.

The HE-AAC global standard is supported by many industry players and is incorporated into millions of devices. The highlights of the standard include very efficient bit rates with uncompromising sound quality; a cost effective licensing mechanism; multi-channel, metadata and flexible control possibilities for different applications. Bitrate efficiency lowers bandwidth requirements and spectrum costs.



Tony Fiedler

Image Acquisition for HD, 3DTV and Beyond

Significant developments have taken place in enhanced image capture and processing for delivery of 3D, HDTV and UltraHDTV. Huge advances have been achieved in CCD and CMOS image sensor technology, by Sony both these technologies having come a long way with steady enhancements over the years. CCD has sufficiently low noise and very low vertical smear, while the noise from CMOS is even lower and there is no smear, though it has flash banding when light changes during the scan. CMOS has higher SNR and is suitable for high frame rates with low power consumption, making it suitable for small size camcorders. Apart from sensors SONY has developed several image enhancement technologies for cameras, to optimise output.



DB Symposium hosts online Webinar session

This special workshop session was organised jointly with LStelcom. In it, the expert, Mr Markus Morgen of LStelcom, addressed the participants through an online webinar from Germany. His video and audio presentation was projected on a large screen and he later answered questions from the participants.

Regulators and operators, it was said, play key roles in frequency and network planning. The regulators focussing on the compatibility and avoidance of interference and the operators mainly focussing on coverage. The webinar highlighted both these aspects and the interaction between them, that needs to be managed. The session also detailed the steps involved in the typical workflow of a modern DVB-T2 planning exercise.

Image enhancement techniques using Retinex theory were presented by Ikegami. Cameras inherently have limited ability to sense luminance unlike the human visual system which encompasses a wide range of luminance variation. Also pictures cannot be obtained with good results during poor visibility conditions such as shadow, haze and snowfall. Image enhancement techniques using Retinex theory, can improve contrast in a shadowy scene and restore colour in hazy scenes.

Korean Broadcasting System (KBS) delivered a presentation on the 3DTV broadcast system and facilities used for the IAAF 2011 event at Daegu, Korea. The service compatible, full HD 3D service method which provides hybrid coded dual streams for L & R signals compared with the single stream used in the frame compatible method, was used for the event. The bitrate adopted was 240 Mb/s (120 Mb/s each for L & R) using the JPEG2000 compression format. Service compatible delivery enabled 3D TV sets to view the picture in 3D whilst non- 3D TV sets were able to display a 2D picture.

'Content Quality and Assurance' is essential to ensure viewer comfort and protect business revenue generated from advertisements. However, traditional 'Quality of Service' (QOS), focusing on measurement of some key technical parameters and visual inspection by operators, is no longer practical with the large number of services and channels available in different formats. To answer this, 'Quality of Experience' (QOE), which monitors the video codec layer, the transport stream and other essential parameters, now provides a better quality assurance method in the digital processing and delivery area.

Assimilating Effective Workflows and Media Management

Though file-based content production has taken off, there are still some unresolved issues, such as interoperability and efficient media management. Current file-based production workflow is complex, with multiple production islands, duplicated services and tightly knit point-to-point connections, making it difficult to integrate with different vendors. The result is restricted collaboration and high IT manpower costs. Systems like the Media Backbone

Conductor provide workflow management solutions that simplify integration of digital production islands and facilitate end-to-end tapeless operations. The industry is defining a standard named 'Framework for Interoperable Media Services' (FIMS) for common service interfaces.

Turkish Radio and Television (TRT) related its experience in setting up a digital archive system. To start with it was essential to clearly understand archive requirements and to start with smaller storage. More storage could be added as the workflow and system grew, allowing flexibility to add advanced storage devices and media. All stakeholders needed to be involved at the planning stage. The first steps involved defining a metadata structure, creating user profiles and deciding the input and output formats required. It was found to be helpful to go for the most flexible and customisable system option as this allowed changes in the workflow, if needed.

KBS has completed a transition to File Based Production System which it commenced in 2005. It took into consideration the input from the staff, potential to reuse parts of the old system and training of staff on the new system. It was very important to consider the people who would use the system first, keep them informed and preparing them for the change. Regular meetings were held with editors. The system storage having increased by 40 times since first installation, it was important to adopt flexible and upgradable solutions.

With fast processing power and high speed connectivity, content can be stored in an external host located anywhere in the world, the so called 'Cloud'. In the past, such solutions did not work well with large amounts of data due to limitations in connectivity and processing speed. But content storage and management solutions are now available creating easy collaboration and more efficient workflows. Security remains a major concern and needs to be addressed carefully.

Broadcasters have new competitors in the form of OTT providers like Hulu, Google TV, Apple TV and others. But it is a growing and open market which, with proper planning and a good business strategy, can become a monetising platform. Going to a multi-screen delivery system involves major changes in workflow and architecture and implementing technology without change management may not provide desired output.



ENGAGING AUDIENCES ON FOUR SCREENS

There has been a rapid transition from traditional platforms to more versatile multimedia platforms such as Hybrid TV, multimedia content over broadband, Smart Applications and the use of cloud technology. Telcos are moving fast to get a foothold in the marketplace which is at the moment very stimulated by content being made available anytime, anywhere on any device. Broadcasters need to step up their efforts in providing their content on these platforms.

Smart TV for Mobile



Content through streaming services is available on mobile handsets but the cost is high due to high broadband charges. Thus, a new service, WebDMB, has been introduced in South Korea, where a pilot service is currently running with several content providers onboard. It is a mobile TV hybrid platform based on T-DMB and the Internet. WebDMB offers a similar experience to the users but through a hybrid smart API which facilitates multimedia content streaming through the T-DMB channel, whereas web content is available via internet connection.

Hybrid TV

Hybridcast integrates broadband services with digital broadcasting to provide a seamless and harmonised experience. Key features are APIs for broadcast resource access that enable information retrieval for the current programme and for stream synchronisation, obtaining timing information to synchronise the broadcast and broadband content. Hybridcast is now in the process of finalising the technical specifications, establishing partnerships with industry players and developing platforms for receiver testing and verification.

Content Creation for HDTV

HDTV has come of age and with it a growing demand for high definition programming. The transition from SD to HD has faced production, technical and in commercial challenges.

File-based production has brought a tapeless environment where nothing is tangible and content creation is influenced by technology. HD brings out fine detail necessitating extra

iPads as Smart TVs

The scenario in Australia is that broadcasters hold less than 10% of the market share of online advertising. iPad-like devices offer a better user experience than Smart TVs as the latter are deemed relatively complex by users. The key lesson is that broadcasters must understand customer behaviour. Broadcasters need to embrace market trends by incorporating social networking and delivery to multiple screens.

Rights Management on Four Screens

Establishing a multiplatform and multi-screen delivery system requires consideration of many critical areas, such as subscriber rights management over multiple networks, addressing the range of device types and formats, harmonising stream management, adaptive rate control and rights management for different devices. Another key area in such a deployment is security and protection of content rights. Managing a multiple rights framework with many different scramblers and encoders is possible and is already in operation in some places.

Content Security

Over-the-top (OTT) content means online delivery of video and audio without the ISP being involved in the control or distribution of the content itself. This is an open platform and is available on many connected devices, including TV sets. It should be regarded as an opportunity for the traditional broadcaster to engage more audiences. However, one important area which needs to be addressed is the security of the content and the network.

Digital Radio Adds Value

Digital Radio Plus, in Australia, provides value added services like EPG, slide shows, pause and rewind and wider choices of content. A system has recently been developed to provide more interactivity through integration with mobile networks. Information is sent to both the DAB+ broadcaster and to the mobile service provider. The Free to Air DAB+ service is broadcast to DAB+ capable mobile phones which remain connected to the regular mobile network, thus providing interaction between consumers, broadcasters and advertisers.

time and effort in makeup, set design and lighting. HD production costs are increased and some outsourcing may need to be considered. The benefits of HD are amazing, including picture quality and long-tail usage, whereas the downside is difficulty in working with mixed SD/HD environments and reduced revenue for SD content.

Some international collaboration in HD production has already taken place in Malaysia between local production companies and producers like National Geographic and



Discovery channels. Relationship building has forged cooperation with producers from different regions. However most HD production in Asia tends to be undertaken by producers from the West. It is time for a change and to encourage Asian producers to make the content which is more authentic.

The Korean viewpoint is that broadcasters have to take viewers who do not have HD receivers into consideration. Cropping takes place when down converting from HD to SD and subtitles are too small to read in SD. It is therefore best to make two different versions where it is important that content is enjoyed by all viewers. As for 3DTV, technology has not evolved fast enough and still requires the viewers to wear glasses. There is currently a dearth of 3D content, restricting the number of available 3D transmission hours.

Delivery of Content including 3DTV and UHDTV



The session looked at the different approaches that had been developed for terrestrial and satellite delivery of UHDTV, 3DTV as well as mobile multimedia services. Super Hi-Vision provides higher resolution and wider angle of view with its large frame size of 7680 x 4320 pixels, and uses a progressive scan frame rate of 120Hz with an aspect ratio of 16:9 and 22.2 multi-channel sound system, providing an immersive experience. Transmission experiments have been done using Ku and Ka band satellites as well as optical fibre and terrestrial means. To meet capacity needs, the 21GHz frequency band will be used for delivery but this band has higher rain attenuation, a problem which is currently under going further studies by experts.

Although DVB-T2 can cater for fixed, portable and mobile reception, some of its specifications are targeted specifically at mobile reception. Mobile propagation conditions induce frequency shifted echoes which require smaller FFT size. The Future Extension Frame (FEF) can be optimised to

carry the proper combination of FFT size, guard interval and pilot pattern to mitigate mobile propagation condition without disrupting any T2 fixed receivers. This new mode of DVB-T2 is termed DVB-T2 Lite because certain parameters that are not relevant for mobile reception are discarded.

Hybrid TV uses both broadcast and broadband to send content to the viewers. As an example, Media Broadcast's Smart TV portal provides information on the screen mostly using text and pictures. The broadcast channel transmits only the relevant programme ID, URL and still pictures. There is no broadcasting of video or audio data and therefore requires only a narrow bandwidth. Once the user selects the programme, the content stream is delivered through the broadband/internet network and displayed on the screen.

Multichannel surround sound is an integral part of the HDTV experience and the 5.1 channel surround sound can be implemented with Dolby E-AC3 without the need to pay royalties for producing and transmitting. Minimal charges are imposed on receivers but this does not have a

significant impact on prices, even for the low cost segment of the HD receiver market.

Regional and local content is a key driver and differentiator for DTT networks compared to DTH systems. It can also be used to generate new revenue streams through local or regional advertising. A well configured DVB-T2 network can be used to distribute the same DTH content from satellite at the same time allowing insertion of local content. The DVB-T2 parameters allow easy insertion of content within the network.

Digital Radio: Looking to the Future

This session addressed current developments in digital radio and how it will march into the new future.

DBS Attracts System Proponents

DVB Asia Review Meeting

The DVB hosted Asia Review meeting on 7 March was attended by a host of Asia-Pacific broadcasters together with Philip Laven, Chairman DVB, and John Bigeni, DVB representative for Asia. An update on the take-up of DVB-T/DVB-T2 systems around the world and specifically in this region was provided, sharing experience gathered from the recent trials in many countries.



DRM hosts Asia Group Meeting

The DRM Consortium had its Asia-Group meeting on 8 March, attended by its partners and Asia-Pacific broadcasters at the DBS. Ruxandra Obreja, DRM Chairman and DRM members conducted the meeting. Briefs on the progress of the DRM standard and of receiver availability were provided. The meeting highlighted prospects of major DRM implementations in Russia and India.



ISDB-T: Demonstration and Open-day

The Japanese digital broadcasting standard, Integrated Services Digital Broadcasting (ISDB) had an open-day demonstration of its technology and its applications in terrestrial and mobile broadcasting. The full day open-house had on display, ISDB-T set-top-boxes displaying SD and HD services, mobile devices with integrated ISDB-T capabilities and a demonstration of the Emergency Warning Broadcasting System (EWBS) on ISDB-T networks. ISDB-T experts explained the technology to the participants and provided up-to-date information on its progress. The demonstration also included the new ISDB-Tmm devices, the mobile multimedia broadcasting standard based on ISDB which will start its services in Japan later this year.



DRM to FM re-broadcasting is a technique used to provide more coverage for existing radio broadcasts. The DRM signal is transmitted with two audio services to a target area over hundreds of kilometres away. It is received by a single DRM receiver feeding two different FM transmitters and re-broadcast. This method can be used for programme distribution without the need for satellite links and for standalone solutions for remote areas, using solar energy and batteries.

The DAB+ rollout in Hong Kong is being carried out by a consortium of four broadcasters and will carry 18 digital radio services. Seven main transmitter sites have been identified and six are already in operation. Four additional gap fillers are planned for 2012. At the end of 2011, 13 channels were available on the network. Promotional activities are being carried out by the consortium to educate the public on digital radio.

The propagation model for digital radio network planning may present a dilemma for engineers as it has to be carefully chosen. Deterministic (or geometrical) models estimate the field strength directly from the path profile and require a detailed knowledge of the terrain. Empirical (or statistical) models provide estimations of field strength where there is insufficient knowledge of the terrain profile. Data is obtained from extensive measurements in different environments and this choice requires only medium rather than high resolution cartography.

Digital Radio DAB+ has just being introduced in some European countries to replace the terrestrial FM radio transmission. DAB+ networks in VHF Band III require wideband and high power transmitting antennas in order to maximize the number of programmes and coverage. The antenna solutions should be flexible to fit to various different installation requirements on loaded antenna towers and masts.

DAB was initially launched in Germany in 1995 but due to limited resources, no indoor coverage and lack of programmes it did not make much progress. When the DAB+ standard was introduced in 2010, the antenna requirements for DAB+ rollout changed, one of the main factors being the space allocation on existing masts. A broadband double-dipole antenna design was used to meet this requirement. It was especially suitable for round towers and could handle the high power required. The second type of antenna used was log-per antenna which was very low in weight and ideal for transmission along railways and highways.



Industry Debate: All Systems Go for Decision Making

A panel comprising experts from all sections of the industry gave a clear go-ahead to the broadcasters for positive decision making towards implementation of digital broadcasting infrastructure and new services.

Commencing the debate, the question on the table was whether this was an opportune time for decision making by the stakeholders in respect of implementation of new technologies and new services.

Mike Dallimore, Vice President, Broadcast Australia, responded that in respect of digital TV and digital radio, so far the major focus had been standards and information gathering and training. The time was now appropriate for the ASEAN countries and others to decide on implementation in the near term and on the types of applications, HBBTV being among these.



Ruxandra Obreja, Chairman DRM, said that broadcasters should meet the expectations of the listeners and that keeping the listeners in the analogue domain would not be acceptable in the market. The time had come for Asia to go for digital radio, taking advantage of lower power requirements.

Rich Redmond, Vice-President of Harris, put forward the thought that the 'future is now'. He said all the key drivers have been put in place, new synergies are developing in the market and the consumers need a bigger experience. If the industry does not go for it, they will all be left behind.

Azlina Mohd Yusof, Director, Malaysian Communications and Multimedia Commission said that the regulators have made things easy for the broadcasters in many ways to implement digital infrastructure and services. Definitely the time is opportune to take decisions and reduce pressure on the spectrum. She said that the industry wants to move forward.

Presenting a perspective from commercial broadcasters, Tan Kwong Meng, General Manager, TV3, Malaysia, said that technical facilities need to create business opportunities. If implementation now can enhance business, commercial broadcasters are all for it.

Andrew Yeo, Publisher and Director, Asia-Pacific Broadcasting, observed that going digital would soon become a question

of survival as equipment obsolescence would come in. The broadcasters should no longer hesitate to take decisive action.

Phil Laven, Chairman DVB, was all for taking decisions and said, "The sooner you start, the sooner you will finish the transition."

Nils Ahrens, Regional Broadcast Manager, Rohde & Schwarz, said that the planning, infrastructure development and setting up of networks was the requirement now. Describing the status of the industry, he said that equipment and the best technologies are available and broadcasters should take advantage of that.

The panel then debated a second question on whether the industry was equipped adequately to support implementation of the new technologies and new infrastructure.

Among the messages that emerged was that the development of equipment was done and the industry could meet all the needs. Affirming that the industry-wide supply base is capable of delivering the requisite inputs to the broadcasters more now than ever before, it was crucial to be successful in the transition to digital and also address spectrum issues. Indicating that the industry was equipped to implement the change, Ruxandra Obreja said that there were no problems in hardware supply and that software was upgradeable. Noting that experience of early implementers is available to the industry, the region would benefit the upgrade of technology.

Deeming it important to engage audiences, the industry is ready to support digital implementation, as had already happened in several countries in the region. The trend was towards adoption of new technology and mitigating infrastructure obsolescence. Most broadcasters have embraced digital and HDTV and implementation should not be any burden to them.

Several questions were asked from the floor which focused on some of the aspects that were raised by the debate.

Wrapping up the session, Sharad Sadhu, who moderated the debate, said that the overwhelming opinion among the industry leaders was that the time was right for the broadcasters to decide upon implementation of digital infrastructure and services. The industry was fully equipped to service the requirements of the broadcasters at all stages.

Decision Time for Stakeholders: Building Business Models

Given the current state of maturity of the digital technologies, time is opportune for the stakeholders to take informed decisions on the way forward. A crucial component of this decision making is the ability to develop business models that respond to the market and generate returns on investments.

DVB-T2 has already passed the experimental and trial stages and infrastructure has been setup with consumer products such, as set-top-boxes, available at reasonable prices. DVB-T2's increased robustness reduces network costs while extra payload facilitates more SD and HD services. Multiple PLP enables flexible service combinations, regionalisation of content and easy management of services when infrastructure is shared between multiple operators. All in all these features provide an overall reduction in capital and operational costs.

Establishing a multi-screen video service enables broadcasters to generate revenue through a multitude of service offerings like catch-up and on-demand.

The market trend has changed. In early 2000 many people started narrow-band services over the internet, but these were of very low quality, expensive and lacked a real business model. However, with advanced technology and increased speed and penetration of broadband internet, broadcast quality video is now possible with other attractive services, opening the doors for different business models. Over-the-top at first looks like a threat to traditional TV, but with a proper approach and sound business model can be used as an opportunity for broadcasters.



DRM30 can actually be used as a solution, which is superior to AM, for wide area coverage. The quality is equal to FM and data can be transmitted simultaneously. It can act as an Emergency Warning System with a range extending to hundreds of kilometres. Energy saving can be realised, as conventional AM transmitters consume huge amounts of power.

Consumers do not care how they receive the video they want to see, as long as it reaches them on their preferred device. Broadcasters need to find solutions to how to get 'on the bandwagon' of multi-network delivery, making their content available on all platforms. With more mobile devices catching the eyeballs, adaptive rate streaming actually enables a high quality TV experience comparable to managed networks.

Connected TV enables more TV programmes to be delivered over the internet and displayed on the connected TV screen. For this to work properly one needs a fast enough broadband connection, a means of presenting the information on the screen and some means of system security and protection. Manufacturers build proprietary portals into their connected or smart TV sets but, in each case, it takes the user away from the broadcast TV content. Similar browsers and decoders are now available in many other devices like smart phones, game consoles, tablets and other mobile devices.

Setting Up Infrastructure in Emerging and Developed Markets

The major cost elements in network deployment are transmitters, site, tower structure and antenna systems. Spectral efficiencies can be increased by using MPEG 4, which allows up to 8 SD services per RF channel. The appropriate transmission modes selected can provide a trade off between capacity and coverage or transmission power. Site location and height also offer a trade off between cost of building and coverage.

Modern FM transmitters need to meet the requirements of today and tomorrow, providing long useful life, cost-effective design and operation, support of digital upgrades and a smaller footprint. Advanced LDMOS technology has reduced



RF power amplifier size while providing higher gain and better cooling efficiency. Lower capital expenditure and operating costs have been the result of these technical improvements providing remarkable flexibility and future-proof designs.



Japan completed its ASO in July last year with a household digital TV penetration of 99%. To handle and address reception complaints and to assist viewers, the government created a support group called DEGSAPO. Specialised measurement vans were used to measure signal reception at hard-to-reach areas and special antennas were installed to cover shadow areas. An effective public awareness campaign was carried out together by the government, broadcasters and manufacturers. This played a vital role in the smooth transition.

Transmitter design and performance have improved drastically over the last couple of years, more importantly, advancement in technology and greener technical specifications. With the modern designs operational costs for transmitters will go far lower as high efficiency has become a key performance indicator for a good transmitter system. New standards have allowed further reduction in use of power and operational ease, with flexible set of parameters resulting in very cost-effective implementation.

Considering efficient TV network setups, five recommendations were offered. Firstly to establish a multi-stakeholder partnership among the regulator, network operator, service provider and manufacturer/retailers. Secondly to consider a common broadcast network operator, sharing a single multiplex for a more spectrum efficient approach. Thirdly, to think of ways to shorten the simulcast phase and consider digital dividend revenues to finance switch-over costs. Fourthly, to consider total impact on all areas while selecting the technology standard and finally, not to underestimate the long term benefits of proper network planning and parameter selection.

There is a significant impact in terms of time and cost on new installations in regard to additional loads on existing towers systems. With towers there is often limited capacity available and a tower may never have been designed to take the loads now being considered. One option now available for such situations is lower wind load versions of the same types of antennas. This offers significant benefits in tower capacity and may eliminate need to strengthen towers to accommodate new DTT antennas.

Digital Implementation by Broadcasters and Industry

The last session presented some of the success stories and challenges of ABU broadcasters and the industry, in digital implementation.

Broadcasters have many ways to think green, providing more environmentally friendly implementations and reducing operating costs. Power can be optimised if the Modulation Dependent Carrier Level (MDCL) technique is utilised to reduce the transmitter's carrier signal when the audio level is low. Other methods of reducing power is to use LED tower lights and strobe lighting.

The digital switchover in France meant implementing six complete SFN networks within a short span of time. For the government, it meant a process that would ensure a smooth and seamless transition for all individuals. But the DSO did bring major changes in the audiovisual landscape, like the end of transmission monopoly, new licensing rules, wider opening of the free-to-air TV market, huge TV equipment sales, kick-off for a market of free DTH and auctioning of first "digital dividend".

One of the world's largest DVB-T2 rollouts with cross border regionalisation has been implemented in the heart of Africa, with the signal being distributed from a central location in Johannesburg, by satellite to DVB-T2 transmitter sites in 15 countries. The DVB-T2 signal is broadcast over a SFN employing Multiple PLP for local insertion of localised content.

In the UK, DRM+ was tested in a highly credible and realistic environment using the frequency and antenna previously used for an FM radio station. DRM+, it was found, provided excellent coverage in good quality at reduced power levels yet superior quality compared with FM.

K-Service or the K-player is the internet distribution platform implementation by KBS. The system encompasses live broadcast streaming, video on-demand, audio on-demand, visible radio services and other value added services like EPG, searching, voting and more. The service is optimised for different platforms automatically using adaptive bitrate streaming and can be accessed by computers, smartphones, tablets and set-top-boxes. It is currently only available in Korea with more than 5 million unique users as of January 2012. The proposed 'Asia-Pacific View' is a similar kind of implementation but targeted at the Asia-Pacific region with content from ABU members. This is intended to become a market place for the broadcasters' content which be accessed by other broadcasters and users alike.

Similar to other digital radio systems HD Radio provides audio and data services in addition to improved audio quality, slide shows, EPG, traffic information, iTunes tagging and more. The technology has been adopted as the digital radio standard of USA, Mexico, Panama and the Philippines with many other countries like Brazil, Bangladesh, and China also operating HD-Radio services. A total of over six million receiver units is currently in operation. Thirty three vehicle manufacturers have also incorporated HD Radio technology in 190 models available in the market today.

Exhibition

This year's exhibition was a marked improvement on the previous years. The 54 booth exhibition provided a much better range and enhanced opportunities for the broadcasters, manufacturers and service providers to interact with each other, discuss and share expertise and experiences and to consider new products, technologies and services.

The exhibition, which spread over three halls, displayed the advances in technology and solutions from leading manufacturers, system integrators and other ancillary service providers in the industry.

The exhibition attracted 36 of our industry partners and was attended by just over 1000 professionals representing broadcasters, regulators, telcos, government officials, media faculty students and others from the industry.

Some of the key products on display included broadcast transmitters, advanced cameras and, image processing equipment, file processing equipment and infrastructure planning tools. Solutions covered, integrated workflow for content creation and broadcasting, camera solutions, frequency and coverage planning, contribution and distribution networks, digital TV/radio systems and OTT distribution over the internet.



Symposium Workshops Focused on Key Areas of Technology Implementation

ABU Management Workshop: 21st Century Management

This workshop provided a different perspective of 21st century broadcast management. Ajith Rohana Colonne, an international consultant, shared his informative presentations with the participants. The workshop addressed areas such as decision and information sciences, ideology, managing perilous situations, decision making process and constraints, and decision making under conditions of uncertainty.



Ajith Rohana Colonne

In reference to the management system of an army, he explained how military intelligence and equilibrium could be utilised in broadcasting management. Also he highlighted managing in perilous situations, with death management and decision making under uncertain conditions.

Broadcast managers both from the engineering and programme departments should conceptually understand the environment pertaining to modern management, namely Uncertainty, Ambiguity, Paradox and Chaos. These parameters may prevail over the core classical management parameters such as Planning, Organising, Leading and Controlling.

Mr Colonne's book "DNA of Roulette" on new ideas for decision making can be downloaded free from his website www.neworiginalthinking.com

DVB-T2 and its implementation

Janne Morstøl and Espen Myhre of T-VIPS presented case studies on the implementation of DVB-T2 in the UK, Sweden, Finland, France and others. SFN can enhance terrestrial efficiency and is more flexible to operate with DVB-T2. For regional content, a key differentiator, DVB-T2 has efficient methods for insertion. With the experience of DVB-T2 rollouts, it was suggested that countries considering implementing DVB-T should leapfrog to DVB-T2 considering the efficiency and advantages it offers.

Video over IP Infrastructure in Emerging, Developed Markets

Dr Chin Chye Koh of Nevion USA laid out the steps in implementing an IP infrastructure to transport media in uncompressed or compressed video, audio and data services.



Chin Chye Koh

The IP network allows more flexibility and easy real-time management, diverse path routing/switching, and robust protection mechanisms. It provides a seamless transport experience together with protection capability customised to a variety of applications, though quality requirements. Bandwidth availability and latency need careful consideration.

Sony XDCAM Workflow Solutions

Mitsuo Kano and Jacky Chung of Sony presented XMPilot, designed to operate with their camcorder and post production desks, helping to cope with increasing demand for efficient workflows. XDCAM uses hybrid disc and memory media, making it more flexible, together with the more efficient MPEG2 Long GOP codec. It provides time saving techniques for naming, logging and managing of clips for field production by interactivity with mobile devices such as smart phones and tablets.



Mitsuo Kano



Jacky Chung

Harris Advantage for DVB-T/DVB-T2 integration

DVB-T2 has a wide range of capabilities which should be utilised to their full extent by broadcasters who intend to offer more programmes, improve operational efficiency and deliver content to multiple devices. In particular, Multiple PLP provides additional flexibility and more control over the number of services. Harris provides an integrated system of transmitters, gap fillers, MPEG4 SD and HD encoders and multiplexers that can be used for deployment in both SFN and MFN networks for a complete and cost effective solution.

Green Technologies for Broadcasting

Broadcast Australia emphasises that 'Green Technology' is a good investment. A holistic approach for reducing power consumption by using renewable energy and examining

other environmental impacts of broadcasting facilities can lead to optimal outputs. What is important is that going green provides operational efficiency at lower costs while helping the environment. The BA Mt. Owen renewable-supported transmission facility is an excellent example of harnessing Green Technology which uses a hybrid (wind, solar and generator) power system to generate the required energy.

Operational efficiencies for Broadcast Infrastructures

Maurice Snell of Snell discussed the technical challenges of using a combination of generic protocols such as SNMP, and vendor-specific protocols, to provide cost-effective user configurable end-to-end control and monitoring systems. A key requirement of monitoring is to give operators tools to help rapidly identify and resolve issues that arise. A wide range of products from Snell include cost effective, integrated and easy to use GUI's giving intuitive access to monitor and control all underlying equipment.



Maurice Snell

Quality of Experience (QOE) for next generation video network

Klaven Siow of Tektronix presented this workshop which looked into quality assurance using QOE monitoring from content acquisition to delivery. QOE can be used as a technique to isolate and identify problems within the video stream giving a comprehensive set of possibilities for the cause of a problem. It does this with deep inspection of every packet across the channels frame by frame comparing each to the video and audio quality matrices. In addition, optimisation of compression bitrate can also be performed reliably.



Klaven Siow

ABU Workshop on Radio Content



Henry Doo



Vishnu Devarajan

Vishnu Devarajan of AMP Radio and Henry Doo of RTHK presented this workshop on how new media applications

are impacting the way radio is experienced by the listener. The current trend is to provide radio content over internet in the form of podcasts, or else provide more information via web pages for more interactivity. Radio broadcasters are using all platforms for delivery of content and while the method is platform specific, the content genres, their formats and duration are quite different. Some real life examples were highlighted as the content creation issues that broadcasters have to face and overcome in the future.

DRM – Practical Considerations for a Successful Service and Network Roll-out

Dr Albert Waal and Alexander Zink of DRM presented the DRM Disaster & Emergency Warning System, Data Contribution & Multiplex Distribution Network and Automated Service Monitoring. They focused on considerations and network setup for a successful service launch, as several countries are in that process.



Albert Waal

Co-Existence between DVB-T/T2 and LTE: Case study in Norway

Pascal Gelugne of ATDI touched on the co-existence between DVB-T/T2 and Long Term Evolution (LTE) networks set up by telcos. The digital dividend is bringing new technologies and other wireless delivery systems closer to the broadcasting channels. Through a case study in Norway, the potential impact of Wireless Broadband Access on digital TV network was assessed and recommendations to overcoming issues highlighted.

How to successfully deploy DAB+Digital Radio: A Practical Guide on Getting started



This workshop was directed at broadcasters needing assistance in deciding upon the selection of DAB+ digital radio broadcasting. With five speakers the workshop highlighted successful DAB+ deployment in Australia, business opportunities available on digital radio, radio with pictures, visual radio, and a look at the DAB family of standards and technologies.

DVB-T to DVB-T2 Fundamentals to Planning

The DVB workshop, presented by John Bigeni and Gerard Faria, addressed basic fundamentals of the underlying key technology of COFDM modulation and how this produces a near perfect transmission. It covered key technologies which make up the DVB-T2 standard. It also covered the characteristics of DVB-T2, especially looking at its flexibility through the use of different bitrates for more robustness and the use of Multiple PLP which allows full control of the services provided.

True Efficiency in Broadcasting



Nils Ahrens, Jürgen Steinheber, Li Bin and Bettina Koethner of Rhode & Schwarz presented the latest advancements in broadcast transmitter systems, including new developments in solid state technologies especially LDMOS, and improved transmitter power efficiency. Also highlighted were the methods used for measuring power efficiency and identified parameters constantly referred to in energy efficiency studies. Latest solutions available for DVB-T2 network implementation were also discussed.

HE-AAC for Digital Broadcasting Hands-on

Stefan Meltzer and Toni Fiedler from Fraunhofer IIS presented the deployment of HE-AAC as the audio codec in DTV networks such as DVB-T2. The broadcast signal chain was demonstrated with real world examples in Europe and 5.1 surround sound transmissions. Generating and

handling of metadata was also discussed for scenarios using HE-AAC only, as well as in heterogeneous environments (transcoding). Target bitrates versus achievable quality was explained by means of independent listening tests and demonstration with sound samples.

Multichannel Audio: Production to Playback



Adam Pinch of Dolby and his team of engineers covered a range of topics around broadcast audio, including multi-channel production, loudness, metadata, and playback. Audio metadata provides a powerful way to manage and control program loudness, dynamic range control and other features. The use of dialogue normalisation, dynamic range control and down mixing using Dolby media meter and metadata emulator was demonstrated using audio and video samples.

The DVB- T2 Trial in Singapore: Key Aspects from an Extensive Test



Holger Meinzer



Stefan Krueger

Holger Meinzer and Stefan Krueger of Media Broadcast looked at their latest DVB-T2 trial. Singapore's media regulator MDA, initiated an extensive DVB-T2 trial in 2011. Media Broadcast described how they designed all test and measurement procedures to define optimum system constellations and network performance. Trial results were discussed with the participants unveiling key aspects of SFN, Multiple-PLP and indoor coverage, which was one of the requirements from MDA.



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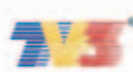
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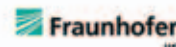
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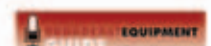
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The decisions of the WRC-12 Conference on Spectrum issues were not as unfavourable for broadcasting services as had been expected. However, there was a clear message from the conference. The message was that the pressure on the UHF band would keep on increasing further and would be likely to result in a negative impact on the operation of existing services, as well as the future development of broadcasting services in the band.

The fact that valuable spectrum (694 to 790 MHz) was actually allocated to mobile services (including broadband mobile), in European and African countries, is quite a significant milestone. Many broadcasters believe that such mobile services cannot co-exist with TV broadcasting simply because of the potential for harmful interference in the reception of TV services. This may, therefore, mark the last chance for the broadcasters to articulate their views in this regard.

If there was a single message to come out of the ABU DB Symposium, it was that the time is opportune for broadcasters to take important decisions on the implementation of the new technologies, thereby creating platforms for providing new services to their customers. The industry representatives clearly declared that the industry is well geared for playing its role in the implementation process. Another important message was that broadcasters needed to address all four screens now used by audiences for consumption of multimedia content.

There was increased emphasis on the deployment of green technologies and possibly upgrading some of the older ones, towards becoming greener and more power efficient. There are now instances of transmission facilities being totally operated by solar or wind power, or a combination of the two.

The quest for green technologies has triggered frenetic research into higher efficiency in the operation of the broadcasting equipment, be it studio monitors and lighting fixtures or low and high power transmitters. Proponents of the green technologies underline the fact that investments in green technologies are always recovered through savings in operational costs.

Whilst the provision of multimedia products via the internet has been going on for some time, the industry is certainly abuzz with OTT ('Over-The-Top' – refers to the delivery of video and audio, via the internet, directly to user connected devices). Current technologies have improved the flow of multimedia products on the public internet and many of us can now experience smoother streaming of audio-video content than ever before.

The question is whether broadcasters, with their vast content resources, are making optimum use of OTT in carrying their products to the audiences. If this is done in a productive manner, experts in the industry see a significant proportion of OTT revenue going to the broadcasters.

ABU sets up Green Broadcast Engineering Award

The 2011 ABU Technical Committee decided to set up the ABU Green Broadcast Engineering Award was set up. This award will be conferred on those who have made engineering contributions of an outstanding nature in developing, implementing and / or promoting green technology in the broadcasting industry in the Asia-Pacific region. This award shall be open to distinguished personalities and organisations in all segments of the broadcasting industry, including the staff or former staff of ABU members and ABU affiliate members within the ABU region.

The Guidelines for the Green Broadcasting Award have been circulated among the members and our industry partners. A sponsor for the award has been finalised. A panel of judges has also been set up. The first such award will be given out at the next TC2012.

The sponsor of the award is KOBA, Republic of Korea. The award carries a cash prize of USD 2000.00 and a trophy.

From Sharad, Nadeem, Bahadir, Kyaw Zaw, Geraldine, Hamidah and Ramlah

New Members

Member

1 Ekh Oron National Television, Mongolia

Ekh Oron National Television is a private nationwide television established in Mongolia in 2010. Its programme line up consists of drama, documentaries, children's programmes, and news and current affairs. It is operating in full high definition format using newly acquired equipment and using new technical.

Affiliate Members

1 TeamCast Technology, France

TeamCast is a private company formed in 2003 in Rennes, France. It is a worldwide supplier in digital modulation technologies for DTV and Mobile TV, Wireless Video Links and Satellite Transmission (OEM products and professional solutions). TeamCast designs, makes and sells products and equipments for the wireless communications industry: Digital Terrestrial TV transmission, Mobile TV / TV for the Handheld transmission, Digital TV test & measurement, Electronic TV News Gathering (D-ENG) and satellite applications.

2 Media Asset Capital, United Kingdom

Media Asset Capital is a specialist media consultancy, based in the United Kingdom. The company's areas of expertise include strategic consulting, project governance and management, market research and benchmarking, product management and marketing, sales and marketing and due diligence.

3 Ikegami Tsushinki Co, Ltd, Japan

Ikegami Tsushinki is a public corporation established in 1948 in Japan. It provides products and services related to broadcasting. Ikegami Tsushinki develops and distributes broadcast TV camera systems, broadcast color monitors, broadcast video production and processing systems, outside broadcast vans, security surveillance TV camera system, medical electronic camera systems, vision inspection equipment and systems.

4 Kordia Solutions, New Zealand

Kordia Solutions is a government-owned company established in 1976 in New Zealand. It builds, manages and maintains broadcast and telecommunications transmission networks covering New Zealand, Australia, South-East Asia and the Pacific islands. It owns and runs the national infrastructure network that provides the radio and television coverage to 99.5% of the population in New Zealand.

ABU Technology Upcoming Events

- Workshop on Management, 25-26 April 2012, Maldives
- Workshop of Radio Studio Automation, May 2012, Bangkok
- IPPTAR-ABU Workshop on HDTV Production, 25-30 June 2012, Kuala Lumpur

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HDTV Operations Workshop

Canal France International, Turkish Radio & Television and the Asia-Pacific Broadcasting Union jointly organised an HDTV Workshop in Ankara in March 2012. The 5-day event looked into the technical and operational issues and techniques of the production environment at a time of migrating from SD to HD production.

The event also included hands-on practical sessions with the experts, in the use of cameras, lighting, make-up and other techniques used for both indoor and outdoor HD productions. Other topics addressed HDTV signal processing, HD camera menu, make-up and lighting in HD, White & Black balance, Black & Hyper Gamma and shading.

The workshop was attended by over 20 participants representing engineers, cameramen, make-up artists, lighting technicians and other production staff from TRT, JRTV-Jordan, Ictimai TV-Azerbaijan and others. The expert, Dr Aly Yeganeh of CFI-France provided a comprehensive perspective of technical as well as an artistic approach to HDTV production.



Pacific Media Partnership Conference 2011 “Strengthening the Voice of the Pacific”



The Pacific Media Partnership Conference 2011 was held in December, 2011 in Nuku'alofa, Tonga. The ABU and Tonga Broadcasting Commission were the main organisers of the event themed “Strengthening Voice of the Pacific”. The Hon. Prime Minister of the Kingdom of Tonga opened the conference and delivered the keynote address. The event was attended by more than 70 senior executives of broadcasting and media organisations in the Pacific Island countries. A total of 43 speakers made presentations at the conference and the associated workshops.

Pre-conference Workshops

Seven pre-conference workshops focused on a variety of subjects, covering areas such as Enhancing PSB, Media coverage of HIV in the Pacific, Radio and Multiplatform in the Digital Age, Emergency Warning Broadcasting, Frequency and Coverage Planning, and Digital Broadcasting Roadmaps for Pacific Island Countries. The workshops were presented by subject experts in an interactive manner, generating good participation from the attendees.



PMP Conference

The conference addressed various issues that pertain to sustainability of broadcasting in the region, including the challenges faced by PSB with changing consumer demands and habits, the possibilities which new media offer the Pacific broadcasters and the relevance of digital TV and radio to broadcasters operating in the Pacific.

Nine CEOs of media organisations put forward their viewpoints in a CEO Forum session on the theme, “The Way Forward for Pacific Broadcasters” which discussed issues crucial to the sustainability and development of broadcasting and to finding solutions.

The Conference adopted a key declaration calling on governments, international organisations and all stakeholders

to assist and empower the broadcasters in the Pacific region to help them carry out their mandate of providing information, education and entertainment through their services to audiences. More specifically the PMP Declaration asked the Governments in the Pacific countries to consider providing assistance to their broadcasters to help them in capacity building and strengthening of their infrastructure and services.

The composite event provided a platform for the Pacific broadcasters to share knowledge and expertise to improve the electronic media in the region and, in particular, for broadcasters from the smaller islands to articulate their experiences and help in finding solutions. We are thankful to the FES, UNESCO, UN-AIDS, CBA, ITU, ABC, NHK Intl, Sasakawa Foundation, RNZ and PIAF for their funding and support ‘in kind.’

WRC-12 Results for Broadcasters

The World Radiocommunication Conference 2012 (WRC-12) took place in Geneva in Jan-Feb this year. Among the agenda items were three relating directly to the broadcasting services spectrum; easy access to operating frequencies for ENG and EFP links; orderly usage of the 22 GHz spectrum for Ultra-HDTV satellite broadcasting and the possible sharing of the upper part of the UHF TV band with mobile phone services.

Spectrum Harmonisation for ENG links gets a No

This item pertained to the frequencies that being used for setting up links for ENG, EAP, wireless microphones and wireless cameras while covering outside broadcast events. These frequencies are in various bands spread all over the spectrum, generally not the same in all countries, or even in neighbouring countries. It is very difficult for ENG operators to coordinate the use of link frequencies and more so in a foreign country.

The discussion centered on at finding ways to identify common frequencies (harmonisation) which would be used in neighbouring countries. This would have greatly facilitated the operating procedures for seeking access to frequencies.

At the conference, while most broadcasters were supportive of frequency harmonisation, the majority of the national regulators were opposed to any such moves. As a result, the conference responded with a decision for “no change” in the regulations.

Orderly Use of 22GHz BSS Spectrum Achieved

This agenda item addressed how to set up orderly usage of the spectrum from 21.4 to 22 GHz frequency band in Region 1 (Europe and Africa) and Region 3 (most of Asia-Pacific) for use by BSS satellites for delivery of direct-to-home Ultra HDTV broadcasting services. The last

WRC had decided to leave the band for use on a first-come-first-served basis. Since that time, many countries had filed for a large number of satellite systems in the band, totaling more than 1000.

Resulting from the above an important goal had become to set up orderly use of the spectrum and orbital resources, and also to prevent individual countries from commandeering all the orbital slots. The conference arrived at solutions to all major aspects, including technical and operating parameters of the BSS satellites, regulatory provisions governing use of spectrum and orbital slots, reducing the number of satellite filings, providing spectrum for uplinks and, most importantly, providing opportunities for equitable access to the spectrum and orbital space resources for all countries.

Sharing of 790-862 MHz band with Mobile Service

This item looked into the compatibility issues of sharing the UHF band between the incumbent services (including TV services) and the mobile service (mobile telephony, mobile data etc). The main issue for this region was the terms and conditions under which band sharing would be allowed.

In this regard, ITU’s studies had found that, in general, the current regulations were adequate to handle the sharing issues. However, according to the broadcasters, these studies were flawed because interference calculations had taken into account only one mobile base station and not the cumulative effect of multiple mobile base stations involved in practical mobile coverage.

As far as the band 790 to 862 MHz, for Region 3, was concerned, the conference made virtually no change in the regulations. It asked for studies to protect existing and future broadcasting stations, both analogue and digital, and to provide results to WRC-15. Another result was that, in Region 1, the 694-790 MHz band was identified for use by mobile services from 2015.

TRT Radio Automation System

by Hakan Kacmaz

Chief Engineer, TRT Radio Department

summary

This article mentions in general terms, the installation, update and operating process of the Radio Automation System that has been used in Ankara Radio since 2003.

Introduction

In conventional radio broadcasting, technical processes were independent and various types of separate sound devices and materials were used. In the early 90s, in parallel with the improvements in Hard Disk based systems, new systems, allowing these processes to be implemented by software, on certain standards and platforms and called Radio Automation Systems, were developed. These Radio Automation Systems enabled an uninterrupted chain through planning, editing and broadcasting stages on a digital platform and within certain standards. Although there were huge advantages there were also a few disadvantages typical of digital disk-based systems.

Advantages

- The monitoring and control of the broadcast chain at all stages (scheduling, editing and on-air).
- Standard sound quality throughout all stages of production and broadcast.
- Allowing more flexible and dynamic broadcast
- Reduction in workload.
- Reduction in traffic of broadcast materials such as tape, CD, etc.

Disadvantages

- Security vulnerabilities due to the operating systems used.
- The potential impact on all stages of the broadcast chain in the case of server malfunctions.
- The dependency upon the supplier of the system purchased, for updating, maintenance etc. due to the lack of open source codes provided by the company.

Radio Automation System

Since 2003 a Radio Automation System has been used in Ankara Radio, a the centre of the TRT radio network.

The Radio Automation System for TRT was selected 2002 and throughout that year the integration of the system and software, installation, training and tests were performed. The automation of four national radio stations was launched in 2003.

The Radio Automation System was planned to fulfill three basic functions that can be summarised as, 1. Schedule preparation units for producers, 2. Editing units for technicians and, 3. Broadcasting (on air) units. The editing and scheduling workstations are terminals to servers, so that no data or audio is stored on the workstations. On the other hand, on-air stations have a captive database and sound storage. All sound files, together with the databases of the programmes to be broadcast, are also copied to the local database and sound storage of the broadcast workstations. In the case of an interruption from the main server this allows the broadcast to continue from the local storage for some time.

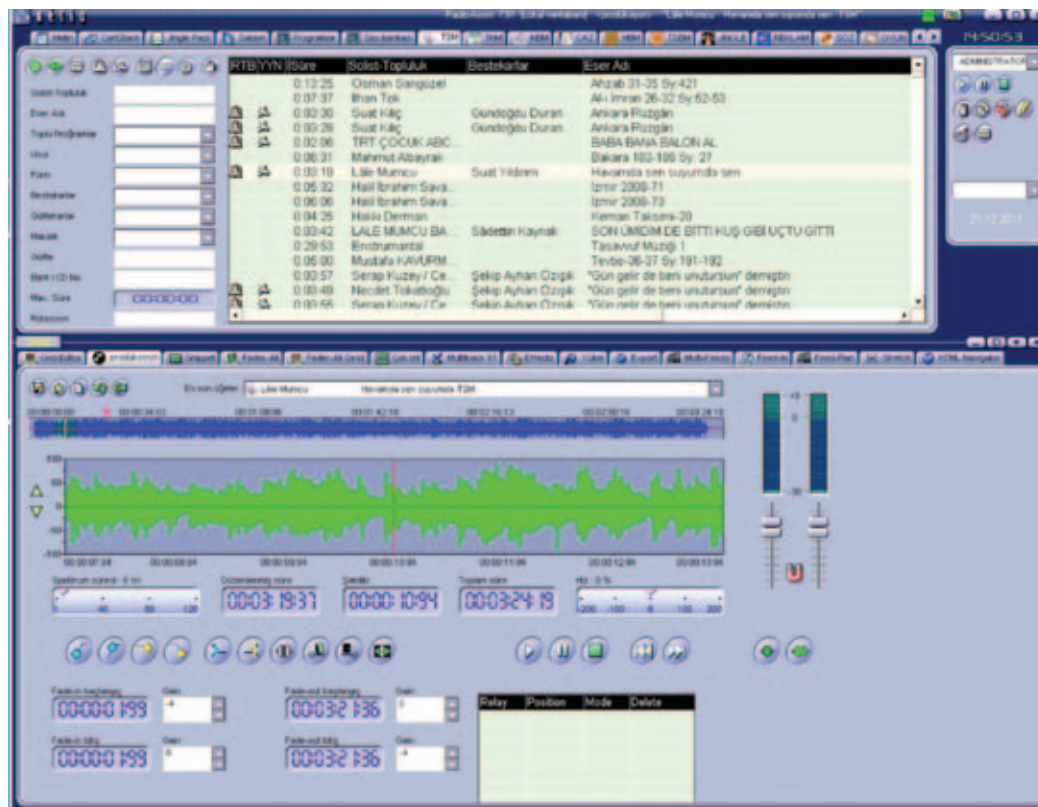
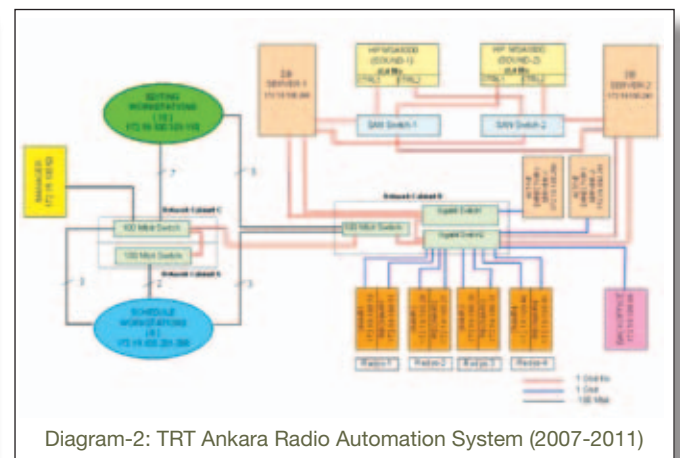
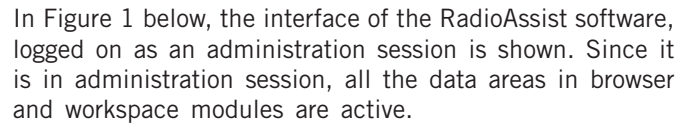
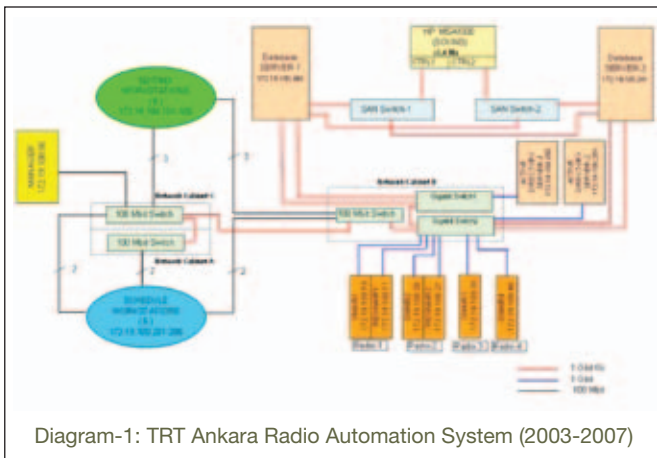
Architecture of Cluster and Mirrored Servers

The first installation of the system, in 2003, had a central server with a cluster structure. Sound files were stored in the shared storage of the cluster structure and the database, linked to the sound files, was stored in local disks of the main and backup servers, which worked as mirrored storage. The shared storage area was in a Raid 5 structure consisting of 20 SCSI disks having 146 GB capacity. Two DAT recorders, using DAT cassettes, provided backup for the databases, but there was no backup for sound file storage. If any problem occurred in the storage area of the main servers, the editing and schedule units of the system would be out of order until the problem was fixed. Besides this, in a case where the sound files suffered partial or complete damage, these had to be reloaded to the system.

New System in 2007

Because of the handicaps of the cluster architecture mentioned above, the architecture of the server, including

In the diagrams below, the differences between the architectures and capacities of the system between 2003-2007 (Diagram-1) and 2007-2011 (Diagram-2) can be seen in detail.



As seen in the figure, the software is divided into two sections. The upper part shows the database, called the Browser. In this part you can search, listen, copy etc., the sound files in the server. The lower part shows the workspace. Each tab represents one tool by which recording, editing, import, export, planning, statistics, etc. are done.

The facilities provided in the editing and scheduling workstations are:

- Importing sound files from different media sources such as tape, DAT, CD, etc.
- Multi-way transmission of audio, from and to the system (import and export) such as any computer on the network, FTP server, etc.
- Easy editing,

such as, jingles, music etc. are found and given on air from the related channel in the screen. Each broadcasting unit has four stereo sound outputs. The first is the playlist channel that is represented by the first column (1st channel), 2nd and 3rd are the stack channels in the 2nd and 3rd columns and 4th output is reserved for PFL (pre fader listening). Programmes can be put on air automatically, semi-automatically or manually.

Sound Types and Formats

The sound format used in this automation system can be set to various types. TRT uses 256kbps/48kHz/Mpeg1 Layer 2. When a sound file is imported to the system from an analogue or digital source, it is automatically converted to these formats.

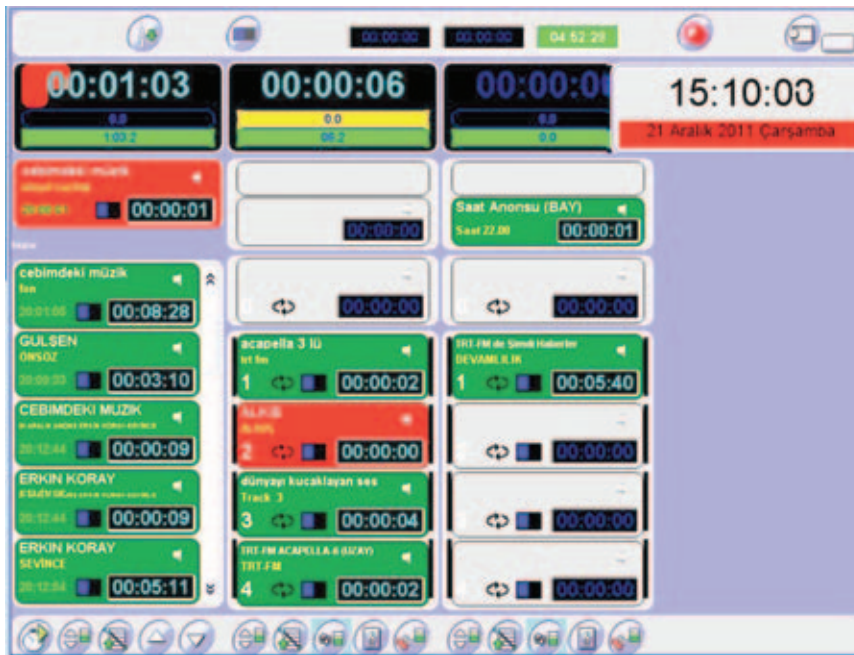


Figure 2: AirDDO Software 1st screen (Broadcast Screen)

- Multi-track editing,
- Statistical analysis,
- Automatic sound recording,
- Creating time-planned programme templates.
- Creating programme playlists.
- Some basic effect generation,

In Figure 2 and Figure 3 below, AirDDO (on air) software is shown.

Air-DDO is a program designed for putting playlists and sound on air. The application consists of two separate screens. First is a preparation screen for loading sound files and monitoring items for broadcast and the second is a broadcast screen for piloting broadcast channels. On the browser screen, scheduled program playlists, sound files

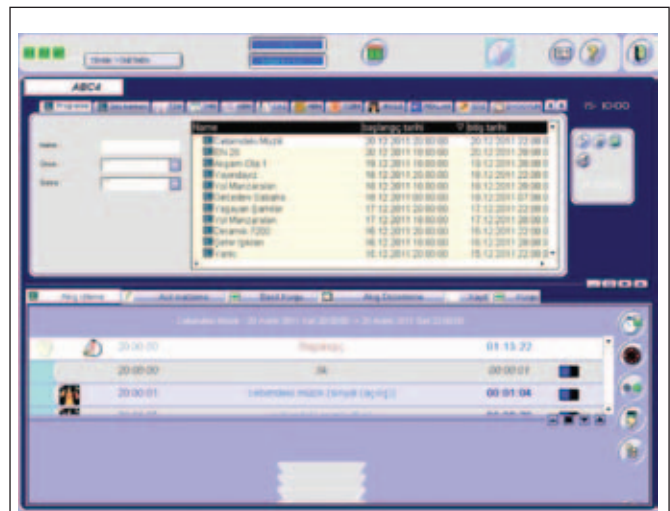


Figure 3: AirDDO Software 2nd Screen (Browser screen)

Sound types in the system are as follows:



Raw Sound (the original sound file imported to the system from CD, tape or announcer)



Produced Sound (sound file after the production process)



Master sound (Masterised version of the edited or produced sound file)



Multi-track edited sound file



Easy edited sound file

Raw and master audio is stored as real sound files. Other audio being stored as virtual sound files composed of the reference information associated with real sound files. If the real sound files are deleted, all the virtual audio that refers to them is partially or completely damaged. Therefore if virtual files are needed to be stored as real sound files, they have to be saved as masters.

Conclusion

The infrastructure of the Radio Automation system that TRT has been using since 2003 (workstations, storage areas,

operating systems etc.) is reaching its limit, both technically and economically. In addition to that, TRT has created its own Linux based Digital Sound Archive System software and technical infrastructure, which it launched in 2010. This new system was not integrated to the Radio Automation System. Therefore a new Linux based Radio Automation System, integrated with the current Digital Sound Archive System, is being developed by TRT engineers and it is planned for launch in the middle of 2012.

author



Hakan KAÇMAZ
Chief Engineer, TRT Radio Department

Hakan KAÇMAZ received his B.S. in Electronics engineering degree in 1997 and a Master's degree in Electronics engineering in 2002, from Ankara University. After graduation, he worked for a private telecom company for one year. In 1998, he joined Turkish Radio and Television Corporation (TRT). Since then he has been working in the Radio Department of TRT as chief engineer. He has also been EBU Euroradio deputy contact engineer for TRT since 2003.



Modernisation in Bhutan Broadcasting Service

by **Rajesh Kr. Kafley**
Chief Engineer, BBS-Bhutan



BBS Studio in Thimphu

Television Broadcasting in Bhutan was launched on 2 June 1999, coinciding with the silver jubilee celebration of the coronation of Bhutan's fourth King. Till then, Bhutan Broadcasting Service (BBS) had been only a radio station. The one-hour TV programme per day was first broadcast only in Thimphu, the capital city, but it was soon possible to take the signal to two main towns of the country namely Phuentsholing and Paro using Bhutan Telecom's lines. Low power (150W) transmitters were used in Band III channel 7 to transmit the signal terrestrially. It was only after the establishment of an Satellite Earth Station, towards the end of 2005, that the signal was made available all over the country, using satellite.

Using a Satellite Platform

The signal, transmitted via satellite, made it possible for BBS to strengthen its terrestrial transmission. Both FM and TV signals, for terrestrial transmitters are fed via satellite. Several TVRO systems have been established with low-power transmitters to cover terrestrially. In Bhutan, a mountainous country with rugged terrain, coverage using terrestrial networks is a big challenge.

At present BBS has 20 TV transmitting stations all over the country with transmitting powers ranging from 150W to 1KW, operating mostly in Band III channel 5 and 7. This, along with cable service gives, approximately 60% of population coverage. Further expansion of the terrestrial

network is underway. Similarly, for FM radio BBS has over 30 FM Transmitting stations, all across the country, with powers ranging from 4W to 1KW.

Progress in the Studio

BBS started operating its first broadcasts from a small studio, which it used for about three years. In 2003, using its own in-house capabilities, BBS designed a new studio and gave itself a facelift. A big generator shed was modified and converted into a professional studio. However the professional studio could not be complimented by professional equipment, due to financial constraints.

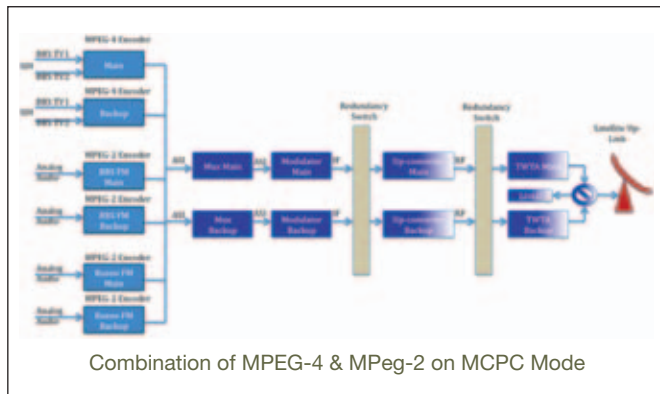
It was only in 2009 that new TV centre was built with assistance from the government of India. The TV centre had one programme and one news studio. With this new building BBS acquired state-of-the-art studio facilities with News Room Automation and Program Play Out Systems. The system comprised four main servers each for News Room control system, automation, video servers and graphics. Thus, in a short span of time BBS moved from a fully tape-based medium to a semi tape based system with video output in DV25 format and analogue audio.

Second TV Channel

Faced with challenges of upholding its Public Service mandates and at the same time meeting public demand to have more entertainment-based programs, BBS have recently launched a new satellite based TV channel named as BBS 2. This was also a way of catering to the government's demand for the live airing of both upper house and lower house Parliament sessions. In addition, it has enabled BBS to venture into more commercial activities, towards being financially sustainable in the long run, through the second channel.

The new channel was launched in one and a half months. On the satellite transmission side all that was required was to upgrade the transmission system from MPEG-2 to MPEG-4 so the existing bandwidth could accommodate two TV channels..

However while doing so it was also necessary to design the system in such a way that the existing terrestrial stations, with MPEG-2 receivers, were not disrupted. This



was done by having a combination of MPEG-4 and MPEG-2 encoders, multiplexed and transmitted in MCPC mode. It enabled BBS to include one more TV channel and 4 radio channels within the bandwidth previously available for MPEG-2 transmissions

The new system can be operated on DVB-S2 mode but because there are many DVB-S receivers used for FM radio stations all over the country, the modulators are still operated in DVB-S mode. This has enabled BBS to use existing MPEG-2 receivers for its radio stations. Presently BBS satellite signal carries two TV channels and four radio channels.

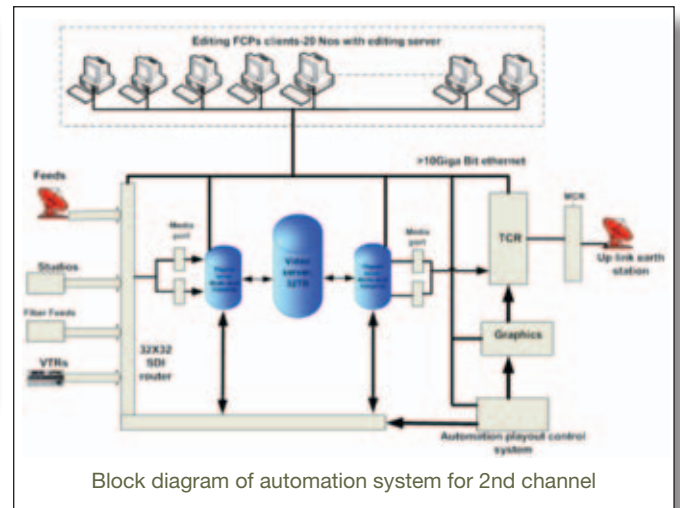
Though BBS has only one radio channel now, provision for two radio channels is available in the satellite up-linking system. BBS is planning to start a new radio channel in another six months. BBS satellite facilities are also used by Kuzoo FM station that transmits programs focused on youth in two channels, one in English and other in the national language Dzongkha.

Studio Facilities in BBS 2

Since it takes few months to set up a fully automated studio for the new channel, a temporary set-up for automated play-out was arranged. This uses software capable of scheduling programmes for long hours. The software is used with two computers, one for ingest and one for play-out. In the meantime installation of the new studio facilities is in progress. The new studio will have automated play-out facilities using three main components namely a video server, graphics and automation system. Installation and commissioning of the new studio facilities for channel 2 is expected to be complete by the end of March 2012. Meanwhile BBS 2 is transmitting programs throughout 24 hours using the temporary studio set-up.

Future Plans and Challenges ahead

The immediate plan for BBS is to start a new radio channel which will be fully dedicated to promote the national language (Dzongkha). The channel will operate on FM, alongside existing radio channels.



With Bhutan having mountainous and rugged terrain, BBS faces a lot of challenges in its terrestrial transmissions for both Radio and TV. Though satellite signals can be tapped for setting up a terrestrial station, there are several constraints because terrestrial transmitting stations have to be located strategically to cover more of the population. Strategic locations in most cases do not have facilities such as power supply, access roads etc. Currently BBS is exploring the possibilities of using fibre lines for reaching remote locations as the backbone. With the initiative from Ministry of Information and Communication, fibre cables are reaching all 20 district head offices and 206 village centres. This is expected to help BBS to increase its coverage terrestrially. However challenges still remain to having 100% coverage terrestrially as the terrain is such that, in some places, even a single village will require at least three transmitters.



With the studio facilities already digital, BBS is considering going fully tapeless soon. There is enormous development in digitalisation of studio and production facilities. However this is not complimented by transmission, where BBS is still striving to increase its analogue terrestrial coverage and has not yet done anything on digital terrestrial transmission. Though digital transmission may help reduce a lot of problems faced by BBS terrestrially, it is not seen as a solution at this point, especially because of financial constraints and lack of in-house technical capabilities. In

order to cope with this BBS is looking for some assistance to explore the possibilities of doing some test transmissions on digital terrestrial television so as to understand its applicability in Bhutan and to build in-house technical capability.

BBS, as one of the youngest broadcasters in the world, has come a long way and is committed to its further development.

author



Rajesh Kr. Kafley
Chief Engineer, Bhutan Broadcasting Service

Rajesh Kr. Kafley, Chief Engineer of Bhutan Broadcasting Service, started as a trainee engineer at (BBS) in 1998, later becoming a fulltime assistant engineer. He worked with Transmission and Maintenance Division initially and installed the first TV transmitter for Bhutan, designed new studio for BBS and worked as a project manager on many technical projects. Rajesh became acting chief engineer in 2007 and has been the Chief Engineer of BBS since 2010. He holds an MBA in Management Information Systems from Maastricht School of Management, Netherlands, and B.Tech in Electronics and Communication Engineering, India (1998).

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For more information and to register, please visit <http://www.broadcast-asia.com/bca2012-international-conference.html>
For all enquiries on the conference, please email Cheryl Choy at cheryl@sesallworld.com

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Announcement of winners at the
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Technical Committee Meeting:
Seoul 12 October

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ABU Broadcast Engineering Excellence Award



Kevin Tan of Sony AP presenting the
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This award recognizes contributions of an outstanding nature in broadcasting engineering and in related disciplines and is sponsored by Sony Corporation of Hong Kong. Under this sponsorship, the winner of this year's award will also be entitled to undertake a study tour of Sony's main Research Center or any other of its prestigious institutions.



The Award is exclusively reserved for the staff of the ABU broadcaster members within the ABU region. ABU members of all membership categories are eligible to make nominations. Former staff of ABU broadcaster members are also eligible. Contributions made within the last five years are also considered for the award.

ABU Engineering Industry Excellence Award



The award is conferred for the most outstanding engineering contribution made by an individual to the broadcasting industry in the Asia-Pacific region. The award is open to all segments of the broadcasting industry within the ABU region. The Award is open to all segments of the broadcasting industry within the ABU region, including the staff (and former staff) of all ABU members including facilities.



ABU Vice President,
Datuk Ibrahim Yahaya of RTM-
Malaysia, presenting the 2011
award to Wang Jianqiang of
Shanghai Media Group, China

www.abu.org.my/engineering-awards

News

from the ABU Region

Australia

Australia's Minister for Broadband, Communications and the Digital Economy has directed the Australian Communications and Media Authority (ACMA) to determine procedures to impose competition limits on the sale of spectrum in the upcoming digital dividend auction.

As a result, a competition limit of 2x20MHz will apply to spectrum in the 700MHz band and a limit of 2x40MHz to spectrum in the 2.5GHz band. No person will be permitted to purchase more than the limit for each band. The limits have been set to ensure a level playing field for the bidders most likely to participate in the auction, without precluding a potential new entrant.

Under the proposed limits, all bidders have the opportunity to bid on the technically optimal amount of spectrum in both bands.

(Asia-Pacific Broadcasting)

Bangladesh

First HD Radio Station Comes Up

Dhaka FM, Dhaka went on the air on 90.4MHz, ringing in the new year as the first FM station to broadcast in HD Radio in Bangladesh. The new station goes on air as part of the country's phase II of FM commercialisation, which authorised new FM broadcast licenses there. An Indian manufacturer provided a full set of RF products and studio turnkey services. The station also purchased a message management system for RDS text and HD Radio data-casting.

(www.radiomagonline.com)

Bhutan

BBS Launches 2nd Channel

Bhutan Broadcasting Service officially launched its second Television channel. The new channel known as 'BBS 2' will air current programmes, entertainment shows and a mix of news, educational programme and sports.

BBS TV was first launched in 1999 with a daily one hour broadcast in Dzongkha and English. The news channel



went nationwide in 2006. BBS 2 said that one of the reasons for its creation was that whenever the parliament sat in session, both houses requested live coverage of their sessions, putting BBS in a very uncomfortable position. The only option was to broadcast the sessions of both houses live. People are able to view their favourite programmes at their own convenience. The launch of the 2nd Channel is also a landmark in the history of BBS, particularly because the launch was initiated without any additional manpower or equipment.

(www.bbs.bt)

China

China Launching 3DTV

China is poised to embrace 3DTV this year – with the State Administration of Radio, Film and Television (SARFT) announcing the launch of the country's "first" 3DTV channel. The channel, to be jointly operated by CCTV, Beijing TV (BTV), Radio and Television Shanghai (RTS), Tianjin Radio and TV, Jiangsu TV and Shenzhen TV, begins trial broadcasts this month and is scheduled to start official broadcasts beginning in January. SARFT will lead the group of TV stations to invest and run the 3DTV channel.

As part of China's 12th Five-Year Plan (2010-15), SARFT has called for 10 3DTV stations to be launched – heralding a "new era" in the TV market in China. CCTV, China's major state TV broadcaster, recently signed an agreement with Sony China to expand cooperation in production of 3DTV programming. As part of the partnership, the Sony China will supply a 3D transmission system, providing on-site supervision and technical support services and assisting CCTV in the production and broadcasting of 3D programmes.

CCTV will also reportedly utilise its broadcast rights to the London Olympics to test 3DTV broadcasts. The tests are scheduled for late second quarter and third quarter of this year – and come amid the continued popularity of 3D broadcasts of global sporting events, including the FIFA 2010 World Cup and last year's Wimbledon tennis tournament.

(www.apb-news.com)

Indonesia

Indonesia Takes up DVB-T2

Indonesia is set to be the latest Asian country to adopt the DVB-T2 digital TV terrestrial transmission standard, if the government's proposal is accepted.

After consultation with industry players, the Ministry of Communications and Information Technology (MCIT) of Indonesia proposed the adoption of DVB-T2 for free-to-air digital broadcasts. Indonesia is expected to go fully digital by 2018.

Following a public consultation in December last year, the MCIT is expected to publish a tender for new DTV broadcast equipment in the first quarter of this year. DVB-T2 would just need to wait slightly longer until DVB-T2 set-top boxes are mass-produced, and the price of DVB-T2 transmitters comes down.



The announcement completes a turnaround for Indonesia, who had previously indicated plans for a nationwide DVB-T network. Indonesia conducted its first DVB-T trial in August 2008, which was followed by a more extensive DVB trial in 2009, covering the suburban areas of the capital, Jakarta.

In a statement, the MCIT explained that the use of DVB-T2 would “open up business opportunities for multiplex broadcasting” and would also “open up the market to additional broadcasters”.

(*Asia-Pacific Broadcasting*)

Japan

Switchover to Terrestrial Digital Broadcasting Successfully Completed

Terrestrial digital broadcasting in Japan, began in December 2003 and was gradually expanded until, on July 24 2011, analogue terrestrial broadcasting was switched off and the process of digitisation was completed successfully.

The process was characterised by target-oriented cooperation between government, broadcasters, manufacturers, and many other parties working together towards a single goal. The ISDB-T terrestrial digital broadcasting standard, developed in Japan, combines the beautiful image quality of high-definition television (HDTV) with solid reception performance and other advantages, such as an emergency warning broadcast system for use in times of disaster. In addition, it enables the implementation of “one-seg” mobile TV broadcasting at the transmitting side which, unlike other standards, is done at no additional cost.

Shortly before the planned analogue switch-off (ASO), Japan suffered vast and severe damage from the Great East Japan Earthquake on March 11, 2011. This led some people in Japan to wonder whether the termination of analogue broadcasting should not be delayed. But the fact that terrestrial digital broadcasting has disaster-resistant features that proved useful during the emergency resulted in ISDB-T maintaining its credibility, and the original schedule was adhered to in all but the three hardest-hit prefectures.

Japan has a population of more than 120 million people. Almost 80% of households view television via terrestrial broadcasting, a ratio that is higher than in other countries. About 70% of Japan's surface is mountainous, resulting in many areas where broadcast reception is difficult. Given this background, the fact that a large-scale switchover from analogue to digital was possible without major confusion or problems must be considered an unquestionable success.

(*ITU New Breeze*)

FBC Launches Free-To-Air Television

The launch of the Fiji Broadcasting Corporation's free-to-air television service in November last set a number of firsts for the nation and delivered clear signals into formerly blacked-out areas, as the nation's oldest broadcaster jumped into TV and digital age.

Half a street was closed for the red-carpet event styled after “Hollywood in the 30s” complete with several stages and live entertainment. The four-hour extravaganza was covered live-on-air from multiple locations within the event and from the FBC studios.

Live coverage of the event was a huge hit with the viewers, especially those in areas previously without a free-to-air TV signal. For the first time, they were able to watch live coverage from the capital Suva, beginning with the official sign-on ceremonies where the Prime Minister officially opened FBC TV, and then followed by the longest live TV



programme in the nation's history and the first to feature simultaneous coverage from multiple locations. While more detailed studies are required, at first glance it appears their new, clear signal is reaching more than 90% of the nation.

The shell of the original broadcasting house built in 1954 still stands, but after complete renovation its new interior is an attractive state-of-the-art facility, housing radio and television studios equipped with the latest technology for production and broadcasting. It offers a healthier, safer and much more attractive work environment for the staff.

After the official sign-on, viewers became aware they were being offered a wide variety of programming and information that included a high percentage of newly created FBC programs dealing with matters of local interest. During a month on air FBC TV has enjoyed enthusiastic public reaction.

(AIBD Broadcaster)

Myanmar

Forever Group Begins Media Training

Myanmar's first private broadcast media training centre, established by Forever Group to produce professionals for the growing broadcast media sector, launched its inaugural course last week. It offers four courses – "Taste of TV", "Basic editing training for assistant editors", "Intensive production training" and "Camera training" – and the first began on January 16. The centre is closely linked with the Forever Group channel MRTV-4, established in 2004. Foreign journalists from organisations such as Deutsche Welle of Germany will contribute to the programme. Forever Group plans to upgrade the centre to college level and offer multimedia courses to meet the human resource needs of the wider industry. The centre also provides specialised training for the MRTV-4 staff. The training centre is not-for-profit and all revenue will be reinvested in the college. Forever Group operates MRTV-4 as a joint venture with the Ministry of Information and also runs the Mandalay FM radio station.

(www.mmtimes.com)

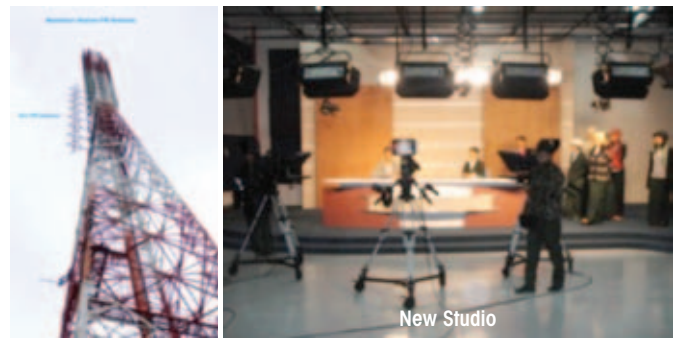
MediaCorp provides Consultancy in Myanmar

MediaCorp Technologies, a MediaCorp Enterprise that provides integrated broadcast solutions to broadcasting companies, has gone beyond international borders to provide broadcast consultancy and project management in Myanmar.



Completed TV Complex

With an e-mail exchange, MediaCorp Technologies clinched the project deal for coverage planning for a new FM station in Myanmar. The consultancy work included drafting of technical specifications for the transmitters and antennae as well as consultation on the selection of equipment. Another area of consultancy was for the set up of the production and broadcast studios for the new FM station.



New Studio

MediaCorp Technologies went on to provide project management services for the installation of the transmitters and antennae in four regions – Bago, Moulmein, Pyay and Taungoo. This was made possible with MediaCorp Technologies' many years of broadcast experience and strong links with System Integrators.

The Myanmar customer subsequently awarded MediaCorp Technologies a tender for the building of a TV complex in their country.

MediaCorp Technologies provided project management services for the outfitting of the TV complex in Myanmar which included equipment installation, training and commissioning. Within a year, a full range of broadcast facilities were made available, including the master control room, news studio and satellite earth station.

Turkey

TRT Mobile Application

Turkish Radio and Television (TRT) now has a mobile application, available in the App Store. The application provides instantaneous programme recording, a 'search' function and a single screen display of important programmes



for the day and current week. It also provides access to previous episodes of favorite productions with a 'listen & view' function, access to flowcharts of all TRT channels and a 'remind' function, for mobiles or pads, to notify when a favourite programme is about to begin. The application is available free of charge and TRT is offering all its TV and radio channels live.

(www.trt.net.tr)

Uzbekistan

Uzbekistan Launches Terrestrial TV-channel on HD quality

The First terrestrial television channel in HD (High Definition) format has been launched in Uzbekistan among the CIS states. New channel titled Uz.HD was opened in Tashkent on 29 November 2011.

Fayzulla Yunusov, first deputy chairperson of National Television and Radio Company of Uzbekistan, said that High-Definition Television (HDTV) is a high quality television



broadcasting standard, which is based on modern standards of image and voice compression. He said that digital technologies, based on video and audio compression, were used in HD television.

He also said that, as a result of the measures adopted in recent years, a powerful, modern production-technical base for television and radio broadcasting had been created at the National Television and Radio Company of Uzbekistan (NTRC). He noted that the company had reconstructed the transmit-receive network with the use of information-communication technologies.

Mr Yunusov said that Uz.HD television channel was created for the effective use of the Media Centre. He said that Uz.HD channel will be filled with content, created on the principle of production of the best programmes, documentaries, and films on culture, history, art, sights and nature of Uzbekistan, local soap operas, and others, created by Uzbektelefilm and NTRC.



Shomansur Abidkhodjaev, director-general of the Centre for Radio Communication, Broadcasting and Television, said that the Uz.HD channel now operates in Tashkent city and part of the Tashkent region and in future will cover all Uzbekistan. At this stage, some US\$1 million has been directed to the project.

It was noted that currently citizens of Tashkent city and several other regions can watch 12 television channels in digital format after buying a digital TV-set or digital tuner. Seven of these channels are Uzbek channels. Currently, digital television covers 36.7% of the population of Uzbekistan. Speaking about development of digital television in Uzbekistan, Abidkhodjaev said that it is planned to cover all the large cities of Uzbekistan by 2015 and all Uzbekistan by 2018.

Digital Broadcasting Update

German DAB+ Boosts Sales

Germany launched digital radio format DAB+ in August last, which is expected to significantly impact sales of portable audio devices (e.g. portable radios, clock radios, radio receivers and other product categories) in Germany. Research data shows there was a “considerable” increase in radio sales in the last few months. A month ago almost eight per cent of all portable radios sold were DAB+ devices. DAB+ technology being particularly interesting to manufacturers as the equipment has a much higher sales value than simple FM receivers. Eight per cent of the units sold account for 17 per cent of the value in the portable radio category in Germany.

(Advanced Television)

Hybrid TV Drive from EBU

More than 20 members of the European Broadcasting Union (EBU) have agreed to collaborate to unlock the full potential of Hybrid TV for a European roll-out of the technology in 2012. This group of public service broadcasters will exchange best practices and support one another to push through a fast, comprehensive roll-out of hybrid television services by EBU Members in 2012.

Underpinning the cooperation is the shared conviction that only high quality, creative content can breathe life into the promise of hybrid technology, and only a flexible, cross-border approach will create the necessary impetus. In signing up to the Hybrid TV project, the participating members are making a commitment both to open standards, such as HbbTV, MHP and MHEG5, and to delivering a compelling new experience to their audiences.

(Digital TV News)

Test and Monitor Ride Digital TV Wave

The inexorable march towards digitalisation and digital broadcasting is set to have a positive ripple effect on the global video test equipment (VTE) markets. The key challenge for vendors will be to design open testing systems and to maintain margins, even while offering consumers cost-effective products with enhanced functionalities.

Analysis of the markets finds that they generated \$298.3 million in 2010 and estimates this to reach \$359.4 million in 2015. The research covers both analogue and digital VTE. The transition from analogue to digital broadcasting initiatives is being driven by the freeing up spectrum which, in turn, is boosting the VTE market. The migration to digital has had a significant impact on the VTE market. Broadcasters need to upgrade their facilities and equipment, which, in turn, has meant more testing.

Evolving customer trends have resulted in an escalating demand for advanced TVs. For instance, there is greater demand for LCD TVs rather than for flat panel display (FPD) TVs, such as plasmas and organic light emitting diodes (OLEDs). Such trends are fuelling greater demand for advanced video test sets.

(Advanced Television)

China TV Global Expansion

China Central Television is launching a major expansion in pursuit of an international audience, increasing its overseas staff fivefold by the end of next year and almost tenfold by 2016. The broadcaster hopes to win millions of viewers in the US and Africa with English-language services produced in Washington and Nairobi. At the heart of operations will be six hubs: two probably in London and Dubai and others in South America and the Asia-Pacific region.

(Advanced Television)

Dramatic Shift in Traditional TV Viewing Experience

Consumer hunger for social media connectivity and demand for ‘anytime, anywhere’ entertainment, is driving the most dramatic industry convergence for the past 20 years and radically shifting the traditional TV viewing experience, according to a global study released report.

Key trends from the 2011 report are; Online engagement and social TV, mobile TV, personal cloud services, and home automation are redefining the home ecosystem; Digital entertainment and social media enhance the traditional TV experience, Consumers are hungry for content and connection and new forms of entertainment and connected services create additional revenue streams and opportunities to strengthen customer relationships.

(Rapid TV News)

India for Digital Cable TV

The introduction of mandatory cable television digitalisation in India would improve the business profile of multi-system operators (MSOs) over the medium to long-term, driven by improved transparency through accurate reporting of the subscriber base. This in turn will provide greater comfort to investors to provide capital to this sector.

The greater transparency will also improve broadcasters’ revenues as they may negotiate better prices. However, the proposed mandatory digitalisation, which is presently awaiting parliamentary approval, will require significant capex to develop digital infrastructure. This will involve significant investments in digital set-top boxes, based on the

total estimated analogue subscriber base of 68 million. In addition, it is believed that mandatory digitalisation would better equip the cable TV distribution industry to compete with the DTH companies at competitive prices. Also, MSOs' ability to offer additional services, like Internet broadband services, using a common infrastructure will improve their operational leverage and help generate additional cash flows.

(Advanced Television)

LED and Smart TVs Prosper

LED-backlit TVs and smart TVs that allow consumers to browse and view shows directly from the Internet are the 'must have features driving television purchases in 2011, according to IC Insights' Integrated Circuit Market Drivers report. In 2011, LED-backlit TVs are expected to account for an estimated 37 per cent of global TV shipments, up from 15 per cent in 2010. LED TVs are forecast to represent 53 per cent of digital TV shipments in 2012.

Besides being thinner and lighter, LED-backlit TVs have rapidly gained favour among consumers because they offer broader colour range, improved contrast ratios, and use less power. Also, LED TVs are said to be more reliable offering over 100,000 hours of life compared to traditional cold cathode fluorescent lamp (CCFL) LCD TVs, which are often rated at 20,000 hours.

The 2012 IC Market Drivers report also notes that the method of delivering programming is quickly transforming broadcast television. Just as smartphones brought the Internet and thousands of applications to mobile phone users, Smart TVs are bringing Internet and Web 2.0 features to television sets and offering access to TV broadcasts, videos, movies, photos, and other content via the web.

(Advanced Television)

Growing Demand for Satellite Transponders

The worldwide demand for C- and Ku-band Satellite Transponders is projected to reach 7,840 36-MHz TPEs (Transponder Equivalents) by the year 2017, driven by rapidly expanding DTH, digital TV, UAV communications, consumer broadband and 3D markets and increased governmental expenditure on military satellite navigation, positioning systems, and space exploration, according to market research.

(Advanced Television)

European Countries Take Up HbbTV Standard

Following the example of Germany, France, Holland and Austria, Spain has agreed to adopt HbbTV as the standard for connected TV. The Ministry of Industry has approved a formal text backed by the whole electronic industry and TV broadcasters including 54 companies to adopt the HbbTV standard to develop new connected TV services.

It is estimated that 25 per cent of the estimated 4.5 million TV sets to be sold in 2012 will be ready for HbbTV. In the current year, 15 per cent (675,000) of 4.5 million TV sets sold are HbbTV-ready, but worldwide events like

the Olympic Games or the Euro Cup Football in 2012 will boost the purchase of HbbTV-ready TV sets.

(Broadband TV News)

New Satellite Successfully Launched

International Launch Services (ILS) successfully carried the AsiaSat 7 satellite into orbit in November last on an ILS Proton for AsiaSat of Hong Kong. Built by Space Systems/Loral, AsiaSat 7 is designed to replace AsiaSat 3S at the orbital location of 105.5 degrees East providing television broadcast and VSAT network services across the Asia-Pacific region. This new satellite will carry 28 C-band, 17 Ku-band transponders and a Ka-band payload. The regional C-band beam covers over 50 countries throughout Asia, the Middle East, Australasia and Central Asia.

(Asiasat website)

BBC 3DTV Rises

The BBC is planning a considerable increase in its 3DTV output. An unnamed drama shot in 3D is being planned. It is reported that BBC was even considering broadcasting a dedicated 3D channel, and would be testing various content including arts and science programming in 3D. The BBC has already offered VoD material in 3D on its iPlayer OTT service, and has recently experimented with flagship programming in 3D.

This year's Wimbledon tennis championships will also be carried in 3D, as will special transmissions from the London Olympics. There have also been strong hints that the BBC will cover some aspects of the Queen's Jubilee celebrations in 3D.

(Advanced Television)

Survey: Operators pushing service innovation to counter 'bit pipe' phobia

Communication service providers (CSPs) spanning the Asia-Pacific, India and the Middle East see the possibility of becoming a "bit pipe" as the biggest influence on their operating strategies, according to a survey conducted by research firm, Heavy Reading, and telecoms software innovator, Open Cloud.

The survey of nearly 100 global CSPs revealed how operators are adapting to changing market conditions. The majority, 90%, cited that the economic situation and the development of consumer and business markets over the past three years have changed the role of CSPs, and their position in the value chain.

The need to respond to competitive innovative from over-the-top (OTT) players was cited as one of the top-three issues of importance to CSPs. However, the response to this market development differs from region to region.

More than 50% of operators in the Asia-Pacific, India and the Middle East view the risk of becoming a connectivity and bandwidth "bit-pipe" is of greater concern than competition from OTT players – contrasting with fewer than 40% elsewhere. The CSPs from these regions also rank customer demand for new services and service personalization as the second and third most important issues influencing innovation strategies.

(Asia Pacific-Broadcasting)

Equipment Trends

Sound System Control Through Web

The release of the Zone Mix 761 has been announced by Symetrix, which adds ARC-WEB compatibility to the feature-set found in the predecessor Zone Mix 760. ARC-WEB allows integrators to build customised interfaces that operate on users' smartphones or internet-connected computers. In addition to ARC-WEB compatibility, the Zone Mix 761 has a modernised aesthetic similar to that of the Jupiter series and includes a new collection of logic outputs on the rear panel.



With twelve inputs and six outputs, it excels at three of the most commonly-required functions in small- to mid-sized installations: paging with automatic ducking, flexible routing and mixing, and comprehensive processing at the input and the output. ARC-WEB technology is a cost-effective way to provide users with customised control of their sound systems from their smartphones or computers.

(www.symetrix.co)

LED Fresnel

Litepanels is now shipping its new Sola 6 LED Fresnel light. The daylight-balanced Sola 6 provides the controllability and light-shaping properties inherent in a Fresnel light, but utilises just a fraction of the power of conventional fixtures. The Sola 6 features instant dimming from 100% to 0 with no noticeable color shift, and it offers beam control from 70° to 10°. Output is flicker free, and remains consistent even if voltage changes. The Sola 6 draws about 1/6 the amount of power to provide the same illumination of a conventional 650W tungsten light, but in daylight output. They draw 90% less power than conventional tungsten lights, with very little heat generation.

(www.litepanels.com)



Scan Converters to Video

Three new scan converters, BrightEye Mitto Fiber, BrightEye Mitto HD, and BrightEye Mitto Pro, have been introduced by Ensemble Designs. The scan converters take video from a computer, such as Skype, YouTube, maps, and medical video, and convert the material to SD, HD or 3 Gbps serial digital video. All Mitto units accept VGA, DVI and HDMI input signals from PC and Mac computers.

(www.ensembledesigns.com)

Dual Channel Frame Sync/Converter

AJA Video Systems is now shipping the FS2, its new universal frame synchronizer and format converter with two completely independent channels that support virtually any input or output. FS2 can be used as two separate frame synchronizers/converters, or channels can be combined in a variety of ways – all within a single, compact 1RU form factor – to support a wide range of workflows. The FS2 has dual channel features in a streamlined 1RU design. Each FS2 video channel supports analogue component or composite, 3G/HD/ SD-SDI, Dual-Link and HDMI I/O, as well as optical fibre I/O options, and each channel has its own still-store, keyer, and video proc amp/ colour corrector.

(www.aja.com)

Weather Protected Loudspeakers



D&B has added to its E series speaker range. The 'lightweight' E4 and E5 are two-way passive loudspeakers intended for theatres, conferences, industrial presentations and broadcast studios, and as surround sound, delay and fill systems. These employ a four inch and five inch LF driver, respectively, and a coaxially mounted wide dispersion dome tweeter. Weighing 1.1kg and 2.2kg, the E4 and E5 produce a maximum SPL of 115dB and 117dB respectively. They can be powered by either the D&B D6 or D12 amplifiers, and up to four cabinets may be driven by each channel of either amplifier. The E4 and E5 are also suitable for temporary outdoor use due to being 'weather protected'. They

have built-in passive crossover networks with a frequency response extending from 130Hz to 20kHz for the E4 and 85Hz to 20kHz for the E5.

(www.dbaudio.com)

Cameras



Building on the success of PMW-F3 and NEX-FS100 cinematography cameras, Sony Professional has created a more powerful and efficient SRMASTER production family that pushes the boundaries of digital cinematography. By providing superb data integrity, fast on-set backup, efficient post production and sufficient headroom, the SRMASTER™ range of products are the fore-runners in next-generation imaging. Look out for the latest in 4K technology in the F65 camera, offering greater exposure latitude, dynamic range and a wider colour gamut. The SRMASTER Series adopts the SR memory card, which achieves a guaranteed read and write speed of up to 5.5 Gbps. Sony Professional cameras and SRMASTER products provide quality, and unparalleled speed and precision.

(www.cabsat.com)

Battery Solutions

Anton/Bauer, a global provider of batteries, chargers, lighting and other mobile power systems for the professional broadcast, video and film industries, showcased several of its advanced power products at this year's CABSAT. High-capacity DIONIC HC and DIONIC HCX batteries are suitable for airline travel. Also featured were the versatile MATRIX Cheese Plate, usable with a variety of Gold Mount Solutions for the Sony F3 and NEX- FS-100, Canon 5D, 7D and 60D, Panasonic AG-AF100 and RED EPIC cameras.

Part of the Logic Series, the DIONIC HC series was designed to handle the demands of today's power hungry equipment utilising advanced lightweight, high current and high capacity, lithium ion cells. The HC series also utilises a honeycomb design to protect cells from puncture and minimise damage in the event of failure. Both the DIONIC HC and DIONIC HCX can travel as carry-on luggage, as well as checked baggage.

(www.antonbauer.com)

3D Graphics Enhanced

New features to ICE v3.0 further extend Snell's channel-in-a-box cost benefits. It now includes powerful integrated 3D graphics and CG functionality with timeline control and the ability to populate fields from Morpheus automation schedule events, as well as external data sources. Changes



in broadcasters' file-based workflows can introduce incompatibilities. A new content validation feature in ICE analyzes source material as soon as it's available to prevent invalid formats or impaired content from reaching the on-air output. Integrated SAN storage brings high-performance shared storage to the platform and aids in optimising system performance and overall broadcast workflows.

(www.snellgroup.com)

Compact Production Switcher

The new, lower-cost Kahuna 360 Compact advanced production switcher offers the functionality of the popular full-size Kahuna 360, including 7 keyers per M/E, resource sharing with Make M/E technology, and FormatFusion3 allowing any format in and any format out. The compact and cost-effective 6U chassis gives users the ability to support SD, HD, and 1080p (single link) functionality for a smooth and cost-effective migration from HD to 1080p and ensures Snell's award-winning production switcher technology is accessible to an even wider audience. Easy to deploy and equipped with the familiar Kahuna interface, Kahuna 360 Compact is ideal for trucks and studio-based productions.

(www.snellgroup.com)

CONVERSION

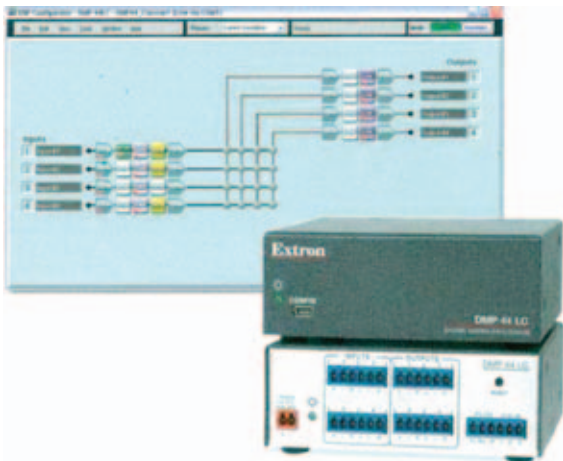
New Signal Processing Platform

At the 2012 NAB Show, new KudosPro signal processing platform will be launched. This addition to the world-leading Snell conversion range offers superb quality frame rate and format conversions at an attractive price point. Performing 3Gbps, HD, and SD standards conversion (frame rate conversion), as well as up, down, and cross conversion, the KudosPro platform offers a cost-effective range of converters to suit all applications including international program exchange, content repurposing for Internet, TV, and Blu-ray distribution, and high-density teleport and satellite distribution. Flexible, automated processing allows sources to be switched between 3Gbps, HD, and SD, with automatic input detection ensuring the appropriate conversion mode. The system also supports a range of audio options including Dolby E, closed captions, time code, and AFD, as well as management and monitoring via SNMP or Snell's RollCall system.

(www.snellgroup.com)

4x4 Digital Matrix Processor

DMP 44 LC, a compact 4x4 audio matrix mixer featuring a digital signal processing platform for audio signal routing and control, has been announced by Extron Electronics.



The DMP 44 LC features four mono line-level inputs and outputs, all balanced or unbalanced. It offers several audio DSP tools for mixing, routing, and room optimisation. Quick and intuitive configuration using the DSP Configurator Software allows the DMP 44 LC to be installed in very little time. The DMP 44 LC is ideal for presentation applications that require line level audio matrix mixing with DSP in a small form factor.

The DSP built into the DMP 44 LC provides wide dynamic range and utilises 24-bit audio converters with 48 kHz sampling to maintain audio signal transparency. Several convenient, easy-to-configure tools are available: level controls, high and low pass filters, parametric EQ filters, bass and treble shelving filters, compressor, limiter, and ducker. The DSP Configurator Software features an intuitive onscreen layout that offers fast access to all the digital audio signal processing tools as well as audio matrix mixing. Designers can quickly get a snapshot view of the entire audio system, including processing blocks, routing, and mixing matrix assignments, all at once.

(www.extron.com)

3D Digital Projector in the Home

Going beyond HD, Sony is offering theatre quality 4K for the home with the world's first true 4K home theatre projector. The 3D-capable digital projector can display stunning 4K images that provide home entertainment enthusiasts with a more immersive, engaging visual experience with over four times the resolution of Full HD.

The VPL-VW1000ES model produces outstanding device contrast and 2,000 ANSI-lumens of brightness achieving a 1,000,000:1 dynamic contrast. It can service screen sizes of up to 200-inches (diagonally) for awe-inspiring cinematic viewing in the comforts of the home.



In addition to supporting 4K native resolution, the VPL-VW1000ES projector also features Super Resolution 4K upscaler "Reality Creation" that enhances all content - SD or HD, 2D or 3D - to higher definition true 4K (DCI Format: 4096 x 2160p) picture signals.

For greater versatility, it has a built-in IR transmitter for Full 4K 3D which drives the projector's TDG-PJ1 USB-chargable active shutter 3D glasses; picture position memory which memorises the position of the zoom lens; and it also supports 2D and 3D anamorphic films.

The VPL-VW1000ES offers a variety of installation options, including dual triggers, a 2.1 motorised zoom, expanded throw distances, an RS232 interface, control over IP and compatibility with virtually every home automation integrator.

(www.sony-asia.com)

3G Converter



The LDK 4427 3G Fibre Camera to 3G Triax Converter is being launched by Grass Valley. The converter allows users producing programs in resolutions up to 1080p50/60 to send their signals across any type of cable infrastructure; The LDK 4427 performs a 1-to-1 conversion of a 3G fibre camera signal to a 3G triax signal. Ancillary data, such as return video, control and intercom are also converted on a 1-to-1 basis.

(www.tvtechnology.com)

New HD Camcorder

The GY-HM150 compact handheld 3-CCD camcorder, based on the ergonomic design of the GY-HM100, has been introduced by JVC Professional Products. The camcorder features a new encoder for improved HD recordings and adds support for standard definition. The company will also mark the NAB debut of its GY-HMQ10U 4K compact handheld camcorder, capable of capturing and recording real-time video at four times the resolution of full HD 3840x2160 images at 24p, 50p, and 60p. It employs an f2.8 10x zoom lens specifically designed for 4K imaging.

(www.tvtechnology.com)





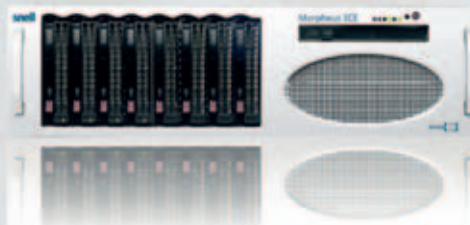
Discover Channel in a Box

Integrated Playout Solutions from Snell



Built on the industry leading Morpheus automation software and the Integrated Content Engine, ICE, Snell's Channel in a Box solutions enable you to:

- Dramatically lower your cost per channel
- Pack multiple functions into a small footprint
- Start small and grow with ease
- Enjoy IT efficiency without losing broadcast resilience



Make it Real

Integrated Twin-Lens FULL HD 3D Camera Recorder



The world's first*¹ integrated twin-lens 3D camera recorder for professional use.

Fall 2010 Debut

In the Panasonic's new full-HD camera recorder, the lenses, camera head, and a memory card recorder are integrated into a single, lightweight body. This is much less expensive, smaller, more portable, and easier to maintain than the current professional 3D systems.

The twin-lens system adopted in the optical section allows the convergence point**² to be adjusted. Functions for automatically correcting horizontal and vertical displacement are also provided. Conventional 3D camera systems require these adjustments to be made on a PC or an external video processor. This new camera recorder, however, will automatically recalibrate without any need for external equipment, allowing capturing 3D image immediately.

Right and left full-HD video streams can be recorded as files on memory cards, ensuring higher reliability than on other media. Eliminating moving parts helps to significantly reduce maintenance costs. Users also enjoy a fast, highly productive file-based workflow.

*1: As an integrated twin-lens 3D camera recorder capable of recording full-HD video to its memory card. As of January 2010 (based on our investigations).

*2: The point at which the left and right-camera lenses' optical axes converge. Specifications and functions are subject to change without notice.

 pro-av.panasonic.net/en/3d

Panasonic Systems Asia Pacific

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