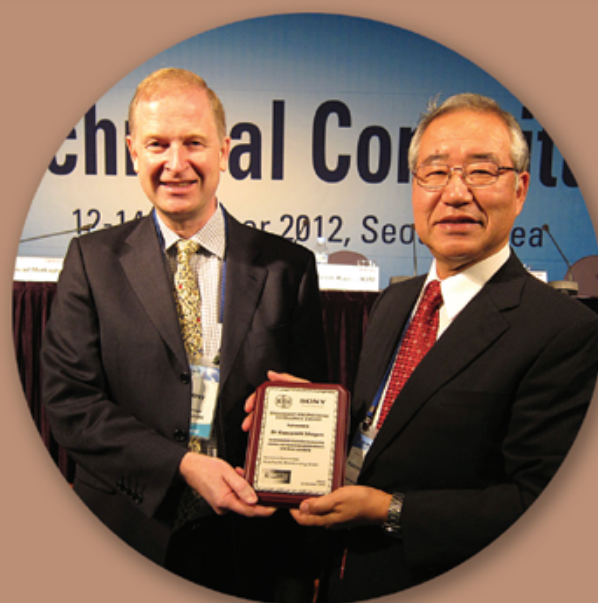




Asia-Pacific
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TECHNICAL COMMITTEE MEETS IN SEOUL
N-Screens Everywhere



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Contents

3	Signal Distribution and Deterministic Re-Multiplexing
8	ZDF's Migration to HDTV
14	Report: DAB+ Digital Radio Demonstration in Jakarta
17	2012 Excellence Awards
19	Technical Committee Meeting
31	Workshop on Digital Broadcasting in Yangon
33	Outlook: Radio is Not Going to Go Down
34	2012 Conference Reports: IBC and InterBEE
35	A Report from RTA-Afghanistan
36	News from the ABU Region
38	Digital Broadcasting Update
41	Equipment Trends



Cover:
Technical Committee Meets in Seoul: N-Screens Everywhere



Asia-Pacific Broadcasting Union

TECHNICAL REVIEW

From the Editor's Desk



This edition offers a detailed report on the ABU Technical Committee meeting in Seoul. Each summary is given with main topics in Boxes.

We also feature three articles contributed by Nevion-Norway, ZDF-Germany and ABU Technology. The Nevion article provides an overview of new and innovative solutions to bridge satellite and digital terrestrial broadcasting worlds by using advanced multiplexing technology for operations in SFN mode.

The ZDF article describes the migration process of ZDF Television from Standard Definition to High Definition in terms of transmission and production changes through the technical concept. It shares the practical experiences of the broadcaster in detail.

The ABU article reports on the DAB+ Digital Radio Technology Showcase which was held in Jakarta, Indonesia in September 2012, explaining the technical advantages with sharing the results of certain trials.

ABU's first "Green Broadcasting Award" was among other Excellence Awards given away in Seoul.

This issue also provides reports of the IBC, InterBEE and several events which were carried out by the ABU Technology including a major digital workshop.

In addition, our usual features, news from the region, updates on digital broadcasting, and new broadcasting equipment, make up the rest.

Just to remind you that the electronic copy of the Review is available on the main page of the ABU website (www.abu.org.my) for ABU members and the general public. Downloading with a QR code is also possible.

This is the last edition of the Review to be edited by the current Editor. He highly appreciates the support received from the readers of the magazine.

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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Signal Distribution and Deterministic Re-Multiplexing

by Dr. Ing Helge Stephansen
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Solution Manager, Nevion

summary

This article provides an overview of new and innovative solutions to bridge satellite and digital terrestrial broadcasting worlds by using advanced multiplexing technology. Of particular interest is that the solution makes it possible to combine national and local content at the transmitter sites and to meet the requirements for operations in SFN mode. It is possible with the deterministic processing which is explained in detail in this article.

Introduction

A key feature of terrestrial networks is that, because they are wireless, it is simple to receive TV signals anywhere within the coverage area. It is worth noting that public broadcasters are normally the main operators of terrestrial networks and that the signal is free-to-air. In this regard, there are three important areas to address:

- Reaching close to 100% of potential screens at an affordable cost
- Reaching TV-set #2 for free-to air reception
- Reaching the population in a region, with emergency warnings

When designing terrestrial networks, operators are driven by the desire to achieve maximum coverage in the most cost effective manner, delivering new high definition TV services as well as local content while at the same time deploying an infrastructure that is prepared for the future multi-device TV services. A common target is to cover a minimum of 95% of the country with digital terrestrial services. Reaching the entire population is generally not possible due to the high cost of overcoming topographical challenges. A possible approach, to achieve 100% coverage depends on utilising a Direct-to-Home (DTH) satellite as a gap-filler to reach those living in shadow areas. Using advanced deterministic multiplexing technology, it is now possible to use the same satellite signal to feed the terrestrial transmitters as well as to reach the population outside terrestrial coverage.

Regional Processing for SFN Networks

Single Frequency Networks (SFN) technology makes a substantial contribution to 'free up' valuable frequencies in the UHF band – this is known as the digital dividend. Thanks to the efficiency of digital TV broadcasting, parts

of the UHF spectrum can now be made available for other applications such as mobile data services. SFN technology has made it possible to build a network with a number of cost effective low-power transmitters instead of an expensive high power transmitter. DVB-T2 has made SFN networks even more attractive as the increased number of carriers in the COFDM (Coded Orthogonal Frequency Division Multiplexing) signal enables extension of the guard interval, increasing the size of an SFN area compared to DVB-T operations.

Involving trade-offs, SFN operation reduces the flexibility to modify the signals in the broadcast chain as the signal on-air must be identical and bit for bit on all transmitters. This means that the signal may either come from a single source, or alternatively if it is being changed at more than one transmitter site, the processing, performed at the other transmitter sites in the same SFN region, must be done in such a way that the resulting broadcast signal is identical. In other words, the processing must be deterministic. The possibility to insert local content is a core requirement for terrestrial broadcasting. And these channels must be inserted into a national multiplex. Using a satellite for feeding the transmitters means that processing must be deterministic in order to support SFN operation. The deterministic processor performs re-multiplexing in this manner. The re-multiplexing may be in the form of filtering where content is dropped from a "Fat" multiplex or even more advanced where services are cherry-picked from a national multiplex, a regional multiplex and the resulting package created by being merged into a common stream to be broadcast in DVB-T2.

Deterministic Re-multiplexing

The deterministic re-multiplexing solution feeds the DVB-T2 transmitter over satellite. It is compatible with DVB-S and DVB-S2 satellite modulation. The deterministic re-multiplexing solution is agnostic to video and audio compression technologies and requires the content to be

transported in MPEG-2 Transport Stream in accordance with the ISO/IEC 13818-1 International Standard.

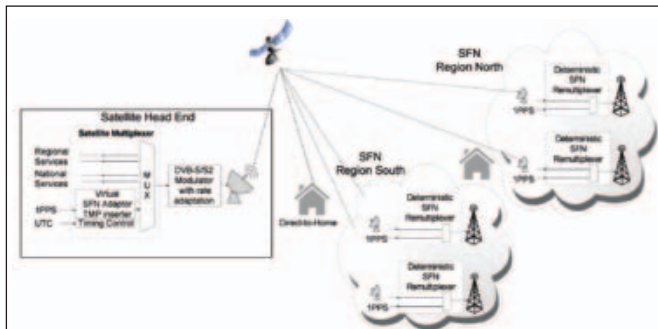


Figure 1: Deterministic re-multiplexing in SFN regions. The core of the system is the Deterministic SFN Master which works a multi-region virtual SFN adaptor. The signal may be distributed over satellite (or an IP cloud) and is compatible with standard DVB-S or S2 STBs. The signal is received at the transmitter sites where the relevant TS packets are filtered or remapped. This processing is assisted by TMP timer packets such that the new stream can be rebuilt in the exact same manner at all transmitters within the SFN region. The Fat multiplex contains all the national programs plus a number of services that carry local content. The distribution system may alternatively use separate feeds for national and regional content or using the "Fat multiplex" principle as shown here.

Regional Content Insertion:

Today's digital terrestrial networks typically contain from three to seven multiplexes, each carrying around a dozen SD television programs or four programs in HD resolution. In addition, there may be some additional radio services. Terrestrial networks have extensive variations in regional content. The local variations may be on multiple levels as different channels, or different local news or just different local ads. In some cases up to 50% of TV services include local content. Regional services may range from full-time

local channels to local news and local advertising. Many of these channels are only transmitted in analogue format. When the Analogue Switch Off (ASO) date approaches, all the local channels need to be converted to digital in order to continue broadcasting.

What is the Difference Between Normal Multiplexing and Deterministic Multiplexing?

Traditional or normal multiplexing is the simplest approach to add/drop multiplexing that has been performed since the introduction of MPEG-2 digital broadcasting in 1995. In this process, TS packets are received on one or more inputs ports and buffered. The output stream is assembled by taking packets from the input buffers. In the case where the source does not have a ready packet, the multiplexer inserts a stuffing packet – in the world of MPEG-2 this is called a null packet since it carries no content. This process can be based on a simple or advanced set of rules, such as setting a higher priority for video packets. No two multiplexers will provide identical output even if they are receiving the same source signals at the same time. The order of packets at the output will be different. In addition, some packets contain Program Clock Reference (PCR) time stamps. The PCR is used for synchronizing the receiver clock to the source signal and the PCR value needs to be adjusted for the time spent in the multiplexer in order to be correct. The adjustment of PCR is performed as the TS packet leaves the multiplexer. Clearly, normal multiplexing is not compatible with the requirement for SFN operation.

The deterministic multiplexing process has been extended from this random process to an operation where the ordering of packets is decided by simple logical decisions. The cornerstone in this process is precise timing which is achieved by the insertion of time marker packets, TMP in the source signals. These packets are inserted at regular intervals in the source streams and contain a precision time stamp. In the deterministic multiplexer, the packets that will be used in the output are tagged with a timestamp derived from the TMP timestamps. The assembly of the output is based on taking the packets with the lowest value for the time stamp first and thereby ensuring that independent multiplexers will always build a Transport Streams with the packets in the same order. The process is related to the timing of the output streams and in case none of inputs sources has a packet ready with a "ready to go" timestamp compared to the output timestamp, the deterministic multiplexer will insert a dummy packet. The last step of the multiplexing is the adjustment of the PCR timestamp. This is also a mathematical process where the value of PCR modification is calculated on the basis of the input time stamp and output time stamp. Deterministic multiplexing can be versatile and may be used to merge services from multiple Transport Streams, drop components, remap of PIDs and all the normal processing that we expect in a multiplexer.

In addition to building the identical Transport Streams, the Neveon deterministic remultiplexer also needs to take care of the SFN timing. In DVB-T this means generating mega frames containing MIP packets with identical time stamps. For DVB-T2 networks, this means, building BB-frames with

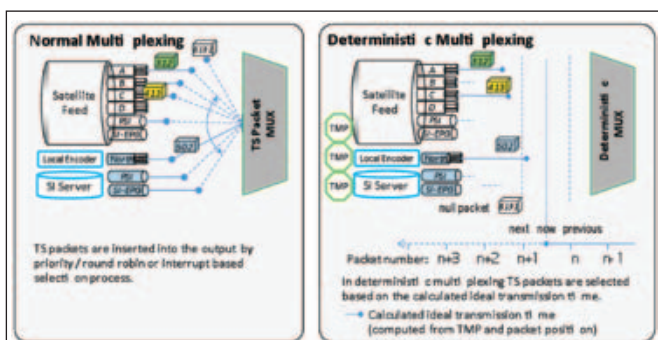


Figure 2: Comparison of traditional and deterministic multiplexing. Normally, multiplexing is performed based on a round robin selection often in combination with priority. The process may be very efficient with regard to insertion of SI with only a few packets wasted on null packets. However two multiplexers will never provide identical packet by packet output. In the deterministic multiplexing packet insertion is based on calculation of the ideal transmission time from the TMP packets. Accordingly, the result of the multiplexing process is always the same provided that the multiplexers have the same configuration. In the illustration packet 502 is ready for insertion in the output but the calculated ideal time is too low for the next packet. Instead, the multiplexer will insert a null packet. Thereafter packets 502, 413 and 312 will be inserted into the output Transport Stream.

identical TS packet content and T2-MI timing packets containing SFN time stamps with an identical SFN time-base. This is accomplished by means of the TMP packets used for the synchronisation of time and clocks. Time is derived from the absolute value of the time in the TMP packets and clock from the increment between adjacent TMP packets.

DVB-T2 Flexibility Offers New Possibilities

A new capability of DVB-T2 is Physical Layer Pipes (PLP) that makes it possible to transmit two or more Transport Stream in UHF channel. The PLP's can be configured with the option of modulation complexity and error correction. A possible application for this could be the usage of one PLP for indoor or mobile reception with robust modulation and error correction and a second PLP for stationary reception with a roof-top antenna requiring a high carrier-to-noise ratio (C/N). In a deployment scenario, this solution may prove to be less advantageous than it first seems, as frequency planning exercises have shown that indoor reception requires up to three times the number of transmitters than for roof top reception making the multiple PLP distribution solution unrealistic.

Can Multiple PLPs Be an Alternative for Regional Insertion?

Multiple PLPs may be used to distribute regional TV services by building the T2 MI signal with one shared PLP containing the national content and one PLP for regional content that may be inserted at the transmitter sites by replacing a dummy PLP.

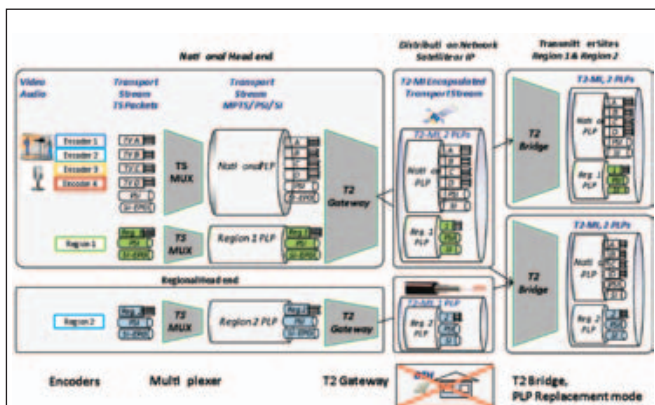


Figure 3: The diagram illustrates the TV service flow from encoder, multiplexer, T2-Gateway and T2 Bridge regional for a Multiple PLP approach. T2-MI stream contains a national PLP carrying the services going to all regions plus a dummy PLP. The multi PLP signals may be distributed over satellite. In this particular case the dummy PLP carries the content for region 1 and thus it is not required to modify the T2-MI stream in the region 1. At the transmitters in the other regions the T2 Bridge will replace the dummy PLP with a regional PLP and a correct T2-MI signal will be delivered to the T2 Exciters. In this particular example, the regional T2-MI stream is distributed over IP to the transmitters. By using S2 multi-stream it is possible to transport multiple regional T2-MI over the same satellite channel. However, the T2-MI signal cannot be used to feed DTH subscribers as no Set Top Decoders are able to parse the T2-MI signal

This approach is useful for some situations where the majority of transmitters do not have local content but simply transmit the national feed without any changes in the content. The PLP substitution will only be performed at the transmitters offering local content. However, multiple PLP has some operational drawbacks. The most serious limitation is feeding T2 MI over satellite; the feed can no longer be received by normal S2 STB and the combination of DTH broadcasting with the feeding of terrestrial transmitters is not possible. Neither can the satellite feed be used as a gap filler to achieve 100% coverage.

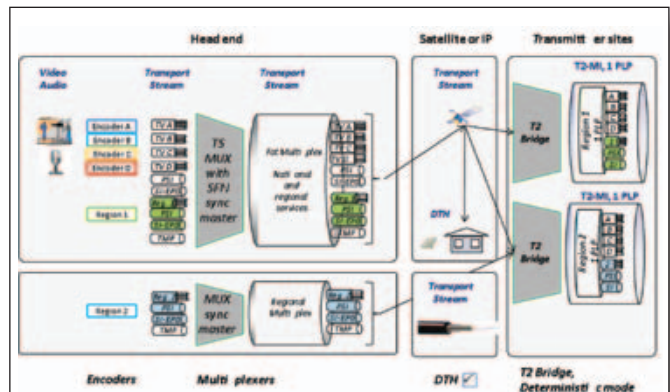


Figure 4: The diagram illustrates the flow of TV services from studio to transmitter through encoder, multiplexer to the T2 Bridge for the single PLP (Fat multiplex) approach using deterministic multiplexing. The broadcast signal is distributed over satellite in a transport stream containing the video and audio content. In addition, the multiplexer adds TMP packets which are used for controlling the re-multiplexing process as well as to reconstruct timing. The satellite signal may be also used to feed DTH subscribers since the signal is compatible with a normal S2 Set Top Box. At the transmitter site, the T2 Bridge will drop all but the national services and the relevant regional service as well as the PSI/SI information for this region. These components are combined into a correct T2-MI signal and delivered to T2 Exciters. The deterministic processing ensures that multiple transmitters in the same region generate identical T2 MI signal as required for SFN operation.

Comparing the deterministic multiplexing and PLP replacement for regional content insertion:

- For single PLPs, the total capacity is available within one Transport Stream. This offers greater flexibility to utilize the capacity compared to the multiple PLP case where the capacity is split into multiple Transport Streams.
- For different regions it may be necessary to insert differing numbers of local channels. Therefore a degree of flexibility is required when dimensioning the bit-rate allocations per region. Using a single-PLP allows for more flexible composition of national and regional capacity. The multi-PLP scenario is inflexible in terms of bit-rate allocation. This is particularly important for dynamic regional content such as insertion of local news or local advertisements.
- Using a multi-PLP approach it is necessary to carry all SI tables in every PLP in order to display a complete EPG for the viewer. With the single PLP alternative, only one copy of the SI is required to build a complete EPG.

- There is less overhead when running a single PLP as stuffing is required for every PLP.
- Deterministic multiplexing offers the possibility to broadcast multiple version of the T2 signal. The main T2 signal may be sent using a default modulation scheme

to cover the main part of a nation. Urban areas tend to have a difficult terrain that requires more robust modulation scheme. In this case, the bit rate will be reduced and this may be achieved by dropping some channels by deterministic processing.

authors



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- 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.
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- 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.
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ZDF's Migration to HDTV

by **Frank Fell-Bosenbeck**

Head of Technical TV-Production Planning, ZDF-Germany

summary

The ZDF started its first HDTV transmission on August 15th, 2009 by transmitting the European Championships in athletics as a so called "showcase event". Two more showcases followed and migrated into regular HDTV Transmission on February 12th, 2010. The following article describes the technical concept of the intermediate solution which was used to migrate from the existing SD play-out to the new HD play-out. Furthermore, it describes the technical concept of the 5+1 HD payout for the transmission of the ZDF programme family as well as the ZDF distribution of the HDTV signals.

Introduction

At the beginning of 2008, the public broadcasters in Germany, ARD and ZDF, jointly introduced a roadmap for HDTV transmission to the German television market. In the roadmap, it was defined that HD transmission would be started via the so called "showcases" and shortly after that to migrate from SD transmission to regular HDTV transmission. In total, there were three showcases, the European Championships in athletics, the international "Funkausstellung in Berlin" and the Christmas concerts in December 2009. Each showcase was defined as a temporary transmission trial. For these trials ARD and ZDF had hired separate transponder capacity in order to realise the SD/HD parallel transmission trials. After successful completion of the showcases, ZDF started with the regular HDTV transmission on February 12th, 2010. Since then ARD and ZDF have been transmitting their programmes simultaneously in digital HDTV and SDTV as well as a number of programmes in analogue PAL. Analogue transmission on satellite was switched off on April 30th, 2012.

1. The Reason for Showcases and Basic Technical Decisions

The reason for showcases was simply to test the concept of programme production and distribution before the technology and the infrastructure was finally implemented for regular purposes. In this way, the entire process of production, distribution and consumer equipment was technically tested. On top of this, the acceptance by the HD viewers of the distributed HD programme was analysed. As a result, it was proven that the programme distribution was technically correct, without any problems. Also the high image quality of the transmission itself was proof that the chosen concepts for the HDTV transmission had been correct. Before the showcases were realised, a few basic technical decisions had been made. First of all the transmission standards has been set to 720p/50 because the general image of progressive pictures was recognised

as better than interlaced pictures. Also the high efficiency of the compression scheme was a criterion for selecting the 720p/50 standard. Mainly because the P2 format was widely used at ZDF, the AVC Intra 100 standard had been chosen for the compression scheme in the entire IT-based production environment.

2. Realisation of the Showcases

This chapter describes the technical implementation of the HD showcases from the basic requirements to the technical concept in the playout as well as in the master control room. Basically, it was required to implement two possibilities for HD transmission: one to allow ingesting from another server or a VTR, the other to allow the transmission of live events via the ZDF playout such as the European Championships in athletics from Berlin or similar events. This realisation was done in parallel with regular programme production and transmission.

2.1. Concept and Total System

Figure 1 shows the realisation of the total HD signal flow from the master control room to the playout centre:

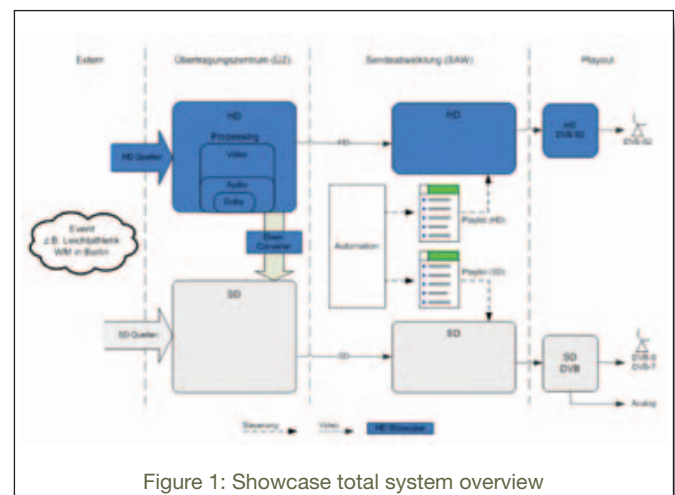


Figure 1: Showcase total system overview

2.1.1. Master Control Room

In the master control room an HD switcher was implemented and a control system was added. The HD signals were processed for synchronisation, up- and down- conversion as well as delay handling. Audio processing was implemented for lip synchronisation and cutting capabilities by considering the Dolby-E Guard-Bands. The HD signal was down-converted via a high-quality converter to be fed into the SD infrastructure. Both signals, SD and HD, were fed to the playout centre in parallel.

2.1.2. Playout Centres

The playout centres were not prepared for the transmission of HD signals. Therefore several parallel operational and monitoring capabilities were implemented. In order to feed internal and external HD signals to the transmission mixer, a separate HD switcher was incorporated. This switcher was controlled via the automation system, requiring two play lists, one for HD and one for SD. For the playout centre internal signal source a K2 Server, DVCPRO100 and HDCAM SR VTR's were installed. The transmission mixer allowed keying, logo, news crawl and character insertion. Figure 2 shows the playout side of the showcase installation. In Figure 3 the two playlists, which were operated in parallel, are shown.

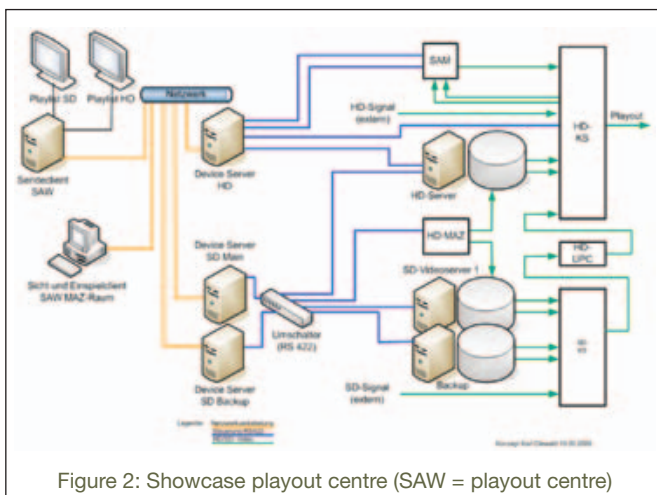


Figure 2: Showcase playout centre (SAW = playout centre)

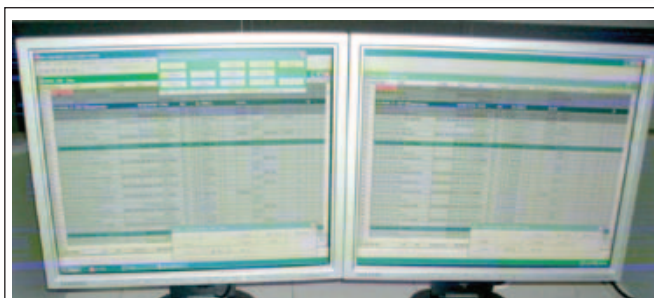


Figure 3: Showcase opened playlists in the playout centre in parallel

As shown in Figure 4, it was also necessary to make HD modifications in the DVB playout centre. Core components like encoder, switcher, multiplexer and networking switches were replaced. The components were controlled by a central redundant management system. Besides the composition of the ASI data streams, the management system controlled and monitored all the resources (components) and performed the automatic switching for back-up in case of failure. Also

the configuration of all possible signal paths was done by the management system. Due to the increasing network components in the DVB playout centres in general, an ASI data stream was generated in the DVB playout for IP streaming at the campus as well as to all partners and to the Internet. For the quality control of the ASI signal, a return channel, using set-top-boxes, was placed into the DVB playout. At the output of the set-top-box the quality of the video/audio, as well as Dolby, was monitored. On top of this, the DVB-SI data was generated in the DVB playout.

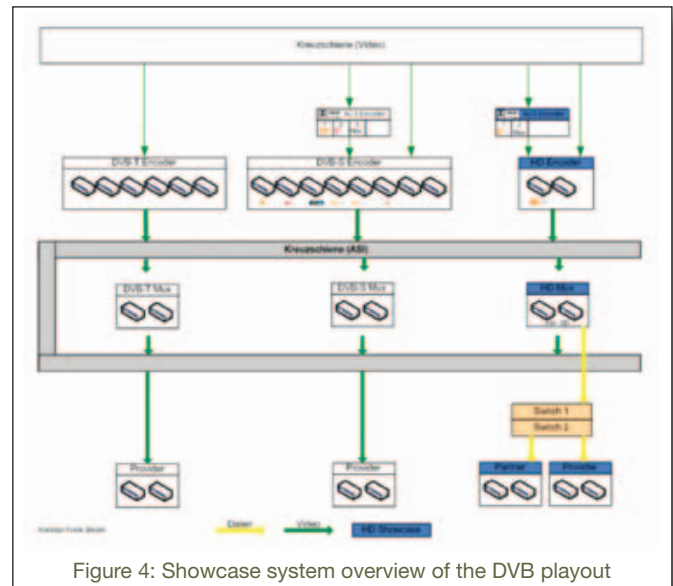


Figure 4: Showcase system overview of the DVB playout

3. The HD Playout

With the HD showcases the public could now appreciate the ZDF main channel in HDTV quality. Due to the intermediate solution the temporal implementation of the technology involved two separate processes for HDTV and SDTV handling. As a result, two workflows had to be controlled during the transmission of the showcases. In order to avoid such complex handling during the regular HD/SD transmissions, a new concept for the playout of all ZDF programmes was developed and implemented. The basic concept and signal routes are described below.

3.1 The New HDTV Playout Concept

The completion of the new HD transmission centre at ZDF in Mainz, Germany, is planned for the end of 2013. By this time, the entire new HD transmission centre for the total ZDF programme family should be finished. The ZDF programme family includes ZDF, ZDFneo, ZDFinfo, ZDFkultur as well as 3Sat which will also be handled at the ZDF transmission centre. All programmes will be transmitted in HDTV as well as SDTV which means SD/HD simulcast. The simultaneous transmission of SD and HD is indispensable to ensure that all older TV-sets can receive the complete ZDF programme family. In this regard, it is also possible to allow a single processing over the whole signal route chain by just feeding HD signals through the campus. At the very end, shortly before the transmission takes place, the signal will be down-converted to SD in parallel with the HD transmission. Thereafter the signal is converted, multiplexed and prepared for the several playout routes.

The programme production is also done in parallel for HD and SD. This means, there will be a large number of SD programme for a longer period of time. Consequently, the SD footage has to be up-converted at the beginning of the campus processing to be able to feed it through the HD signal route. Therefore, all SD footage is being up-converted in the master control room. On top of that, the simulcast SD/HD transmission of the new playout centre realises the handling and monitoring of synchronous live streams as well as providing on-demand content for the ZDFmediathek video-on-demand services. Figure 5 shows the principal concept of the new playout centre.

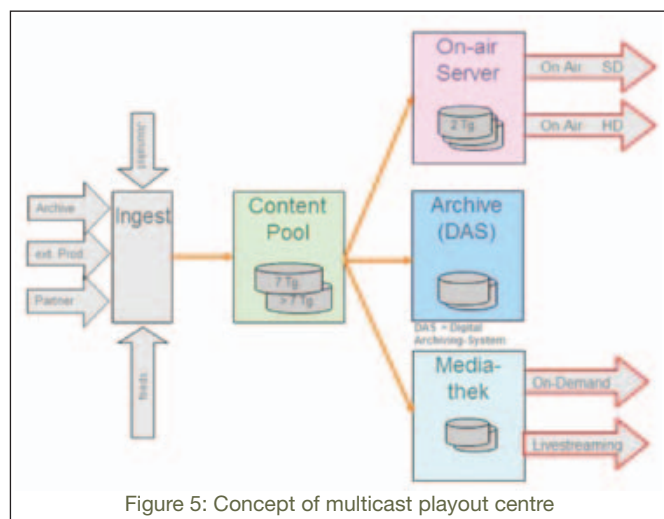


Figure 5: Concept of multicast playout centre

In total, five new playout centres will be operated to cover the transmission of the five channels. On top of this, one more playout centre will be added to allow a back-up functionality and testing for hard and software up-grades. In case of a disaster, this additional playout centre will take over the functionality of the faulty playout centre. For this reason, the back-up playout centre is physically placed in another building. The ZDF programme family requires access to the same content. Therefore, a content pool including a content management system has been designed and will be fully implemented by the end of this project. The content management system handles the following tasks: acquisition of the metadata for every single programme, unifying the workflow handling and prevention of doubling of workflows. Moreover, the facility of an open architecture for the user oriented operational workflows will be implemented. On top of this, the content management system is a completely tapeless operation and provides the programme files for other areas like the programme archive. The overall playout centre is designed for 24/7 operation and content provision. This results 365 days continuous operation. For the disaster operation, both hardware and software are redundant. All workflows are designed to cover such situations. The overall programme handling is controlled by the Pebble Beach Marina automation system.

3.2 System Architecture and Signal Flow

The automation system controls the transmission of the programme family as well as advertisements. All equipment needed for these processes can be controlled frame accurately over RS 422 or GPI control lines. Figure 6 shows the overall architecture of the new playout centre.

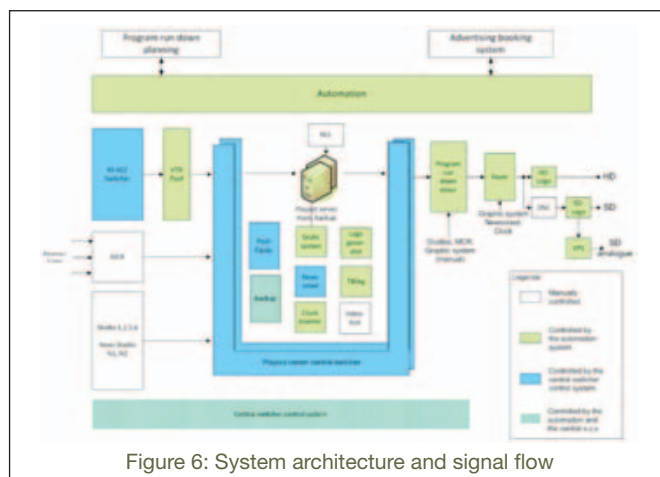


Figure 6: System architecture and signal flow

For the automatic operation, a special interface was developed to allow the exchange of programme planning data between the automation system and the existing programme planning system named "Pharos" as well as the advertising booking system. Both systems were developed by ZDF in-house. The playout data for the EPG in the digital transmission route are transferred via an actual VPS label. One overall control system is the central switching control system. It allows the central control of all connected equipment which needs to be available for the SD/HD transmissions. It allows, for instance, the changing of workplaces, realisation of logic functions and virtualisation of the connected equipment. Beside the control and monitoring of the connected equipment, the control system also allows monitoring of the selected signal which will be displayed as labels in the multi-viewer, the programme run down mixer and the tally information display.

3.3. Ingest

Ingest consists of two signal paths. One is for the baseband via VTR and incoming feeds, the other one is for file ingest. The ingest room consists of three ingest workplaces and a NLE workplace including 5.1 Dolby monitoring. Presently, some materials are delivered in DVCPROHD, HDCAMSR and Digi Beta tape formats and some material is delivered via incoming feeds. There are five DVCPROHD VTRs, two HDCAMSR VTRs and three Digi Beta VTRs. All materials are recorded on two ingest servers. The VTRs are controlled via a RS 422 switcher. The ingesting is generally managed by the automation system. In case the footage is longer than one tape length, the material is recorded in the server and then edited by the NLE system to make one file out of two. Error correction is also made by the NLE system which is connected to the ingest servers. Therefore, it is not necessary to copy any file because all files are stored and handled in these servers. On top of that, the programme files can be controlled by separate jog/shuttle operational panels. All recordings on the ingest server are done in the 720p/50 format. In case another format is supplied, it will be cross-converted before recording. This belongs also to external feeds. The compression scheme being used is AVC-Intra 100. For the correct handling of Dolby E a separate audio shuffler is used. This equipment allows the following corrections to be made:

1. Changing audio tracks
2. Changing audio level

3. Splitting mono tracks over two stereo tracks
4. Decoding of Dolby E and recording as stereo

The following audio track definition is made by ZDF internally:

- AES 1/2 = Transmission tone stereo or mono
 AES 3/4 = Dolby E or transmission tone stereo/mono
 (The conversion into an AC-3 data stream is made during the coding process for the DVB transport streams)
 AES 5/6 = Audio description or transmission tone stereo/mono
 AES 7/8 = Narration tone or transmission tone stereo/mono

Because of the Dolby E processing all the Dolby E equipment needs to be transparent and the Dolby E guard frame needs to be considered because it is valid for two frames in the case of 720p/50.

As for the file ingest, all material is directly fed onto the ingest server. If file conversions are required, separate software will be used to allow the file conversion from any format into the server file format. The server dimension is designed to keep 368 hours of HD material in AVC-Intra 100. From the ingest server, the material will be transferred into the content pool. On this server, it is planned to allow a 24/7 operation for the ZDF programme family consisting of five different programmes.

3.4. Preparation for “3G”

By the time of the tender, the availability of 3G was not consistent. Strategically the decision has been made inside the ZDF to prepare the production facility for 3G as far as possible to secure the investments for future use. Hence, a few preparations have been made for the playout centre:

- All central components like distribution devices, central switches and routers are 3G HDSOI ready
- Cable length optimized for 3G HDSOI
- High-quality cable and connectors as well as connector plates
- External signals are fed via 3G optical fibre

4. Distribution as of April 30th, 2012

The distribution of ZDF HD content is realised today by incorporating additional capacities on the transmission routes via satellite (DVB-S2), cable (DVB-C) and IPTV (Internet). On the satellite, 26 MHz transponders are used with 42.5 Mbps data rate each in total (8PSK, 2/3 FEC and 22MS/s symbol rate). With these parameters, each transponder incorporates three programmes by using a statistical multiplex with AVC/h.264 video encoding an MPEG Layer2 as well as Dolby Digital sound per programme and the distribution standard is chosen as progressive 720p/50. The whole programme family consisting of ZDF, ZDFneo, ZDFkultur, ZDFinfo as well as the partner channels 3Sat and KiKa ("Kinderkanal", channel for children) is transmitted in HDTV and SDTV simultaneously. For the HDTV transmission, the HD uplink station is built on the ZDF premises in Mainz. The backup system is built in the capitol studio in Berlin that is linked via a fast network connection to the Mainz central facility. In case of failure or bad weather, the

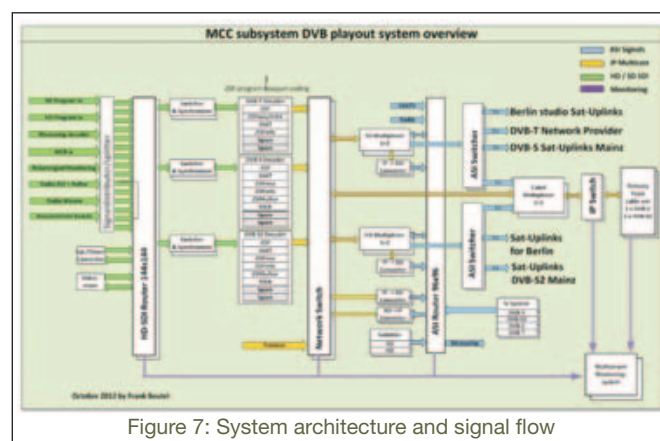
Satellite transmission can be switched from Mainz to the capitol studio and back within two seconds.

ZDF HD content is distributed via all major transmission routes used in Germany which are satellite (DVB-S2), cable networks (DVB-C) and IPTV platforms. Beside the satellite transmission, the ZDF HD programme is also fed into the cable network.

Approximately the 80% of all German cable households can receive HD programmes via the cable network. For the remaining 20% the cable providers receive the signal of the complete programme family via satellite and transfer the signal into the cable environment regionally. All IPTV providers can receive the signal directly via cable in Frankfurt. This multiplex consists of the ZDF HD as well as the SD bouquet (ZDF, ZDFneo, ZDFinfo, ZDFkultur, 3Sat and KiKa). The total capacity of this multiplex is 48.5 Mbit/s and can be transmitted into a 256 QAM modulated (DVB-C) 8MHz channel.

5. Multiplex and Compression Centre (MCC)

With the HD transmission, the ZDF has to feed different signal transmission routes. Every route is using its specific compression. Therefore a multiplex and compression centre (MCC) has been designed and implemented within the new playout. In the MCC the SD/HD compression for the simulcast transmission is performed for DVB-S, DVB-C, DVB-T and for the ZDF internet video on demand platform named “ZDFmediathek”. At the output of the playout centre the MCC generates the necessary data rate and compression scheme for the different distribution channels. From there the signal is fed into the individual distribution route. For the monitoring of these signals a separate control room has been implemented to allow the users to individually monitor and control every single transmission route. The following, Figure 7, shows the general system overview of the DVB coding and switching subsystem which is part of the MCC.



available and the availability is continuously increasing throughout the country. This method of transmission will also increase successively in the households in order to receive HD programmes.

On the production side, the IT-based production will be increasingly migrated from SD operation into HD operation. Currently the ZDF is investing in the expansion of the system to make this migration possible. Another topic is the 3G capability. Due to the fact that the current trend in the TV market is the increase of the resolution for HD pictures, the migration to the Full HD Standard 1080p/50 (3G) is the next logical step. For this reason, the ZDF is

investing wherever possible in the "3G ready" infrastructure. For instance, the central control room (MCR) has already been renewed incorporating the full HD3 technology. The playout centre which started at an earlier stage is partially 3G ready and the new studio control rooms are also currently built with 3G technology. The investment of ZDF in 3G is to secure an investment for future technical developments. Currently it is uncertain whether 3D will be an issue for the ZDF because the mainstream TV is not the media for such technology. But in case the development changes and 3D becomes of interest to the television industry, ZDF will be prepared for this situation because of its 3G investments.

author



Frank Fell-Bosenbeck

Head of Technical TV-Production Planning, ZDF-Germany

Frank Fell-Bosenbeck, Head of TV Production Technology Planning, ZDF-Germany, has a degree in Electronics and IT engineering as well as in business administration. He is a certified project director and has more than 25 years' experience in the broadcast industry. He began his career with Sony Broadcast Europe as a Service and support engineer. Three years later he joined Panasonic Broadcast Europe, where he worked for 12 years in technology, product management and Marketing. Since 2002, he has been working for ZDF, in his current position.

**Nature is unique.
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Documentaries on ZDF

German Television





DAB+ Digital Radio

DAB+ is the digital radio standard of choice for broadcasters across the Asia Pacific. The move from analogue to digital radio is important for:

- Building brands
- New revenue opportunities
- More for your listeners
- Protecting radio in a digital world
- Long term transmission and network savings
- Keeping valuable spectrum for radio broadcasters

radio multimedia traffic data

To support broadcasters in the Asia Pacific region, WorldDMB will host a workshop at the ABU Digital Broadcasting Symposium, Kuala Lumpur, 5-8 March 2013.

This tailored workshop will include information on the on the switch from analogue to digital radio and covers topics such as:

- regulation
- licensing
- technical trials
- network build out
- marketing
- production of new digital radio content

About WorldDMB

WorldDMB is the global industry forum for digital radio, facilitating the implementation of digital broadcast radio based on DAB+ and DMB. Its global membership includes stakeholders from across the industry and from around the world and includes public and commercial broadcasters, network providers, car, receiver, chip and equipment manufacturers.

www.worlddab.org

Report: DAB+ Digital Radio Demonstration in Jakarta

by **Ahmed Nadeem**

Head of Studio Technology & Training, ABU Technology

by **Kyaw Zaw Lin**

Specialist Engineer, ABU Technology

The Ministry of Communication and Information Technology of Indonesia (KOMINFO), Radio Republik Indonesia (RRI), WorldDMB and the ABU (Asia-Pacific Broadcasting Union) organised this DAB+ Digital Radio Technology Showcase event in Jakarta from 24-27 September 2012. The 4-day "DAB+ Technology Workshop and Transmission Demonstration" comprised a two day technology workshop followed by a two day transmission trial and field measurement exercise in and around the city of Jakarta.

The Workshop

The workshop provided participants with up-to-date information on all aspects of planning and implementation of digital radio, its transmission technology addressing its enhanced features and efficiencies compared to analogue FM broadcast. DAB+ is one of the digital radio standards that are being considered in many European countries and in the Asia-Pacific, including Australia and Hong Kong, who have official adopted the standard.



The first day of the workshop was focused on the DAB+ industry uptake information, case studies and different business models adopted by broadcasters who have rolled out its services. Some of the topics covered included a DAB+ international market update in Europe and the Asia Pacific, the DAB+ Business Case looking at the Australia rollout and their market spaces. The presentations also highlighted some of the key areas that need to be considered when planning for digital radio rollout and implementation. Topics like changes taking place in media consumption; audience research statistics; why radio should go digital; government regulation; getting support of all the broadcasters, public and private; spectrum issues; coverage planning; receiver market and manufacturers; transmission setup and, most important it was said, educating the customers on the digital radio service.

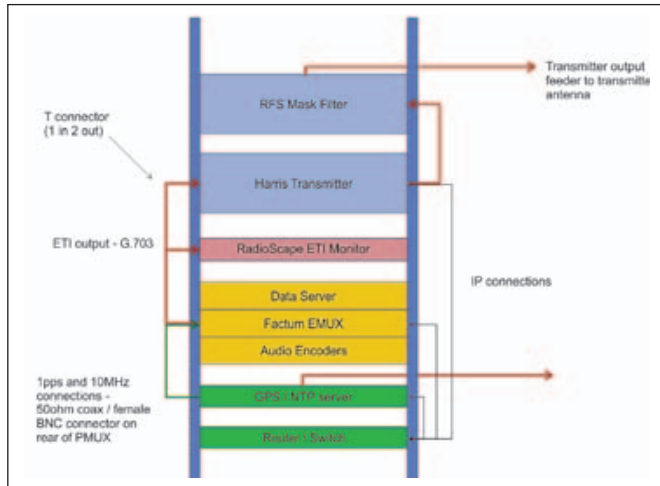
The workshop also saw a presentation providing an update on Indonesia's digital radio plans and current status for going forward. Indonesia has adopted DAB+ as its digital radio standard and the planning process is almost complete. The plan is to start trial in Jakarta by end of this year followed by other major cities. It was observed that Indonesia is a vast country with a huge population, geographically distributed all over the country. He also touched on the recent developments that have taken place within RRI, including the digitalisation of studios and streaming of their radio channels over the internet and to mobiles.

The other interesting topic looked at the DAB+ System as a whole. The presentation addressed the DAB Family of Standards, DAB+ Features, channel structure, system architecture and the future of DAB+. It also touched on some implementation related areas like cost effective infrastructure, flexible operation for broadcasters, many features including scrolling text, images EPG and data services and many new developments of DAB+. It was noted that DAB+ is a proven technology which has been deployed in many countries worldwide and is expanding rapidly with a sizeable and growing variety of receiver products available in the market now.



The second day focused on technicalities of DAB+ implementation and operation as a service. Topics included audio encoding system, PAD, multiplexing, FEC code rates, OFDM transmission, SFN operation and multiplex network design considerations and options, coverage planning, discussion of MFN and SFN, operation interference issues, black spot rectification and a live demonstration of tools used in digital radio planning. Among other areas some of the advanced and value added features were explained including text messaging, animated slideshow (APNG), electronic programme guide (EPG). There was also a look at the receiver market; the types of receivers currently available in the market and their price range. Thanks to the partners most of these different receivers were also made available in the small exhibition space allocated within the workshop room.

The workshop sessions ended with an explanation of the system demo setup that was to be used for the measurement exercise in the following two days, including the system setup and a demonstration of equipment operation including the multiplexers, encoders, transmitters and antenna system. The workshop closed with an explanation of the field trial routes, the test equipment that would be used and how the data processing was to be done.



Field Measurements and Results

All the participants and experts visited the transmitter site of RRI and it was further explained how the equipment setup with a demonstrating of its operation and the various services configured to run on the system. After this the participants were divided into groups to follow the selected measurement routes with one of the experts who explained the operation of the measurement equipment and what each of the parameters meant.

The measurement exercise focused on demonstrating and testing the following:

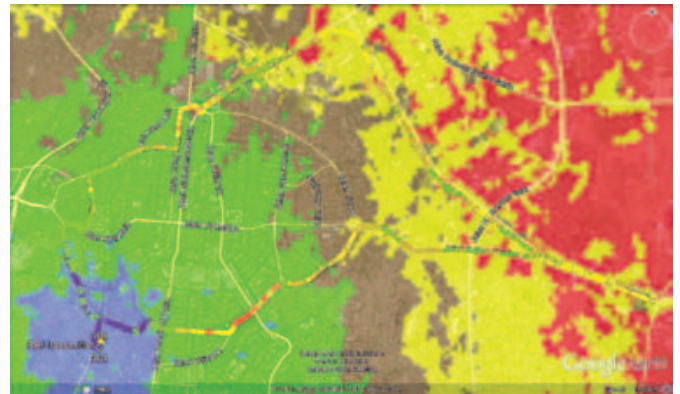
- Operation of the field test system;
- Impact of different audio bit rates and coding methods
- PAD – DLS and SLS
- Impact of field strength on performance at different FEC code rates – 1A, 3A, 4A
- Multipath situations

Demonstration Setup and Parameters

Parameters	Services			
	1	2	3	4
Content type	Music/Speech	Music/Speech	Mainly Speech	Music/Speech
Service label	Pro 1	Pro 2	Pro 3	Pro 4
Sub channel/ID	0	1	2	3
AAC+ Audio coding	Stereo	Stereo	Para Stereo	Mono
Inner Layer FEC	1A	3A	3A	4A
Sub-channel bit rate	64	80	48	32
PAD bit rate	8	16	8	8
DLS	1	1	1	1
SLS	7	15	7	7
Audio bit rate (kbps)	49.6	56	35.2	20.8

The drive around tests were carried out in four different routes starting from the transmitter station, with the system recording the signal performance while at the same time the participants were able to listen to the audio broadcast from the receiving set installed on-board. Four different routes were selected to explore the limits of coverage in different directions and to experience the effects on the signal of different environments.

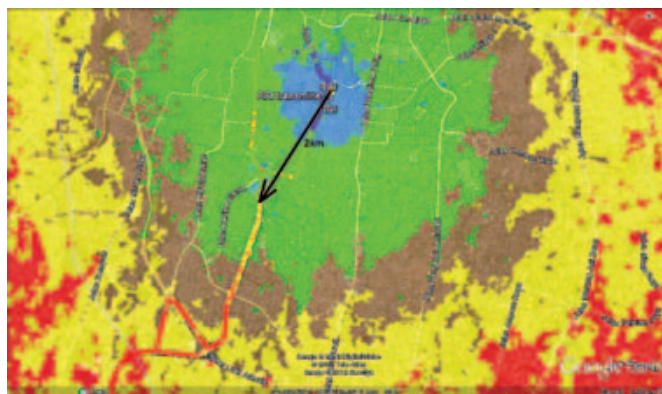
While discussing the results of the field measurements a number of important points were discussed including; That predicted coverage is essential to gain an understanding of the expected coverage so that you can plan what critical areas you would want to concentrate in your measurements; That measured results show reasonable correlation to the predictions although 40m cartography is inadequate for planning high density cities; 50m antenna height does not give good coverage as was noted in the results, with even low rise buildings causing difficulties in reception due to shadowing. It is important to note that this was not a full-fledged trial, but merely a demonstration of the system setup and its performance. The results seen confirmed the predictions and the performance improvement of digital radio over analogue FM by comparison. It was noted that proper field testing is essential to prove and fine tune the predicted coverage and it requires good planning and enough time for testing in cities like Jakarta where the traffic density is so high.



The event also gave rise to a set of recommendations on how to proceed with planning and implementation of digital radio systems. These recommendations looked at the important areas of policy and regulatory issues, network

planning and coverage modelling, tender committees and network implementation, promotion and marketing, receiver manufacturers and retailers and motor vehicle audio providers.

The event was attended by over 55 participants representing radio broadcasters and regulators from Malaysia, Singapore, Thailand and Indonesia. This showcase event was also supported by many industry partners including Commercial Radio Australia, Harris, ATDI, Keystone Semiconductor, Factum Electronics, Radioscape and Southern Cross Austereo who provided equipment for this demonstration and shared their expertise and experiences during the event.



Our Contributors



ABU TECHNOLOGY UPCOMING EVENTS 2013

29-31 January	BES Expo 2013	New Delhi
11-13 February	In-country workshop in Vanuatu	Vanuatu
28 January-1 February	10th Global Shortwave Coordination Conference	Tunis
March	Regional Workshop on Satellite Communication	Sri Lanka
4-5 March	ITU-ABU-AIBD Workshop on Digital Broadcasting Implementation	Kuala Lumpur
5-6 March	IPPTAR-ABU Workshop on HDTV Studio Operations	Kuala Lumpur
5-8 March	ABU Digital Broadcasting Symposium 2013 "Next-Gen Media Space and the Connected World"	Kuala Lumpur
7 March	DBS 2013 – Sports Workshop	Kuala Lumpur
5-8 March	DBS 2013 Programming Workshops	Kuala Lumpur

Excellence Awards Presented in Seoul

The 2012 ABU Broadcast Engineering Excellence Award was presented to Dr Kazuyoshi Shogen, Senior Associate Director, B-SAT-Japan. Dr Shogen joined NHK (Japan Broadcasting Corporation) in 1979. Currently, he is a Senior Associate Director of B-SAT, Japan.

SONY
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Dr Shogen has greatly contributed to the development of satellite broadcasting systems, including a pioneering effort in antenna engineering technologies, including a highly contoured beam antenna using shaped reflector techniques. He was also engaged in research on new satellite transmission systems for Hi-Vision and UHDTV (Ultra high definition TV) or SHV (Super High-Vision) in the band 12 GHz and 21GHz and has contributed to the re-planning of the 12 GHz BSS for the Region 3 at WRC-2000 through the ABU and the Asia Pacific Telecommunity. His role in the 21 GHz BSS is most remarkable as he piloted the issue in his capacity as the Chairman of the ABU Technical Committee from 2006 to 2010.

The 2012 ABU Engineering Industry Excellence Award was presented to Mr James Rodney Santiago, Consultant, ARIB. Mr Santiago is considered to be a leading broadcast engineer in the field of digital television in the Philippines. He has made a significant impact among broadcasters to engage in further research/studies on the future of digital TV broadcasting.

ARIB
Association of Radio Industries and Businesses



The inaugural ABU Green Broadcast Engineering Award was presented to Mr Seon Kwon Kim, Executive Managing Director, Korean Broadcasting System. As a key member a national committee on green broadcasting and telecommunications, Mr Kim has contributed to developing agenda and realising essential milestones in this area. He initiated research on LED lights in KBS with manufacturers and introducing an LED lighting system in KBS. Mr Kim set up a 5-year-term plan to replace 12 existing power-intensive vacuum-tube transmitters with efficient solid state units to reduce the power consumption by 90%.



KBS 한국방송
KOBA 2012

The Best Article Prize was jointly awarded to Dr Ngo Thai Tri, Nguyen Chien Thang and Hoang Thanh Tung of Audio Visual Global JSC, AVG-Vietnam, for the article "The First DVB-T2 Single Frequency Network (SFN) in Vietnam".

AVG



Dr Ngo Thai Tri



Nguyen Chien Thang



Hoang Thanh Tung



Aaron Hee

The first Commended Article Prize was jointly awarded to Chris Grey and Aaron Hee of Sony Corporation of Hong Kong Ltd, Broadcast & Content Creation Solutions Asia Pacific Division, for the article "HD Imaging Technology".



Chris Grey

The second Commended Article Prize was awarded to Garry Kum of Television Broadcasts Limited, Hong Kong, for the article "Metadata Project – TVB Experience," which appeared in the Jul-Sep 2012 issue of the Review.

TVB





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Technical Committee Meeting in Seoul

This year's annual Technical Committee (TC) meeting was held in Seoul, Korea from 12-14 October 2012. The meeting was hosted by Korean Broadcasting System (KBS). In his opening remarks, the TC Chairman Mr Yeo Kim Pow thanked the KBS for the fine arrangements made for the meeting. Welcoming the TC delegates, on behalf of the host, Mr Seon Kwon Kim, the Executive Managing Director, New Media & Technology Division of KBS, outlined the changing media landscape and how KBS along with the rest of the world is progressing.



ABU Secretary-General Dr Javad Mottaghi addressed the Committee and highlighted some of the major events carried out by the ABU Technology in the past year. Among these he mentioned the new initiatives taken to engage the members in the Pacific and Central Asia. He also noted the efforts by ABU Technology taking greater steps to provide more interactive and engaging online activities for the members.

The three days of meetings addressed several issues pertaining to broadcasters and the industry as a whole. The meetings included presentation of technical awards, interesting presentations on several crucial topics, a CTO Forum, technical information workshops, informal forums on key issues and a special topic session presented by the host KBS. This year the meeting also held the election of TC office bearers for the next two year term.

At this year's sitting the TC endorsed three key decisions and one recommendation reached at the meetings. It also presented the inaugural Green Broadcast Engineering Award.

Technical Awards

At the technical awards session, the Engineering Excellence awards were announced and this year's winners were Dr Kazuyoshi Shogen, Senior Associate Director at

B-Sat Corporation-Japan and Mr James Rodney Santiago, Consultant with Association of Radio Industries and Businesses (ARIB). The best article prize under the three Technical Review Prizes was jointly won by Dr Ngo Thai Tri, Mr Nguyen Chien Thang and Mr Nguyen Chien Thang of AVG-Vietnam. The inaugural ABU Green Broadcasting Award was won by Seon Kwon Kim, the Executive Managing Director of KBS.

Meeting Highlights

The ABU Digital Radio and Developing Broadcasters' Forums held their annual meetings, identifying the main issues that they need to address in the coming year. Asaad Bagharib, MediaCorp-Singapore and Ms Lim Soh Kwang, RTB-Brunei, respectively presided over the meetings.

Six technical information workshops addressed topics such as a desirable band plan for 700MHz, modern production facilities, DVB-T2 using multiple PLPs and SFN, video streaming over wireless LAN and UMID applications in material management.

This year's Keynote Address was presented by Dr Kiho Kim, Executive VP of Samsung, who addressed the interesting topic of "Future Information and Communication Technology Megatrends and Implication for Broadcasting". The presentation looked into the changing media landscape and how consumer demand is affecting the way media is distributed in the current ecosystem.

KBS presented the Special Topic Session at the Committee meeting themed "N-Screen Technology and KBS' Strategy", which highlighted some of the major activities being carried out and planned for the future



in the area of engaging the four screens, hybrid systems and the roll out of KBS's own Player K platform.

A highlight of the meeting was the election of the new office bearers of the Technical Committee for the coming term of two years. Dato Haji Abu Bakar bin Abd Rahim of RTM-Malaysia was elected as the new Chairman of the Technical Committee for the next two years. Mr Masakazu Iwaki of NHK-Japan, Mr Hamid Nayeri of IRIB-Iran and Mr W B Leung of TVB-Hong Kong will be joining him as the three Vice-Chairmen. Altogether, 18 members were elected to the Bureau.

At the conclusion of the meeting the Chairman profusely

thanked the host KBS for the excellent arrangements and efficient handling of the meetings. The Committee also noted and thanked the outgoing Chairman for his valuable past contributions as the Chairman and as a member of the bureau. He was presented with a memento.

The meeting also saw a special award conferred upon the Director of ABU Technology, Mr Sharad Sadhu, who will be retiring from the ABU after almost 20 years of service. He was awarded the ABU Distinguished Service Award for his numerous invaluable contributions during two decades of dedicated and outstanding service to the ABU and its members.

Members Prepare for Future

A facilitated session on current technical issues and challenges faced by members was held in the morning of 12 October; moderated by Asaad Sameer Bagharib of Mediacorp-Singapore and John Yip of RTHK.

TBC-Tonga gave an update on Pacific Island broadcasters, expressing the problem of "transmission power" and also training difficulties. Fiji TV said that KBS assistance had been received and upgrades had been done recently. For Fiji, TV coverage to outer islands remained a problem; therefore radio had a big role in this regard. RRI-Indonesia reported their updates and digital radio plan. DAB+ had been adopted in 2009 and a local, Jakarta, DAB+ trial had been done recently. In order to migrate to digital, RRI needed single frequency networks. AIR-India stated that a number of DRM transmitters had been installed in the country but the cost of receivers was still a problem. It was suggested that ABU should come forward and cooperate with manufacturers in this regard. PBC-Pakistan advised that they were working on channel allocations which could change audiences. Two MW transmitters had been implemented. They also had 14 audio channels on their website and a WebTV studio had been set up to start operating next year. Saudi Arabia reported that in the last 10 years, digitalisation had proceeded and now DVB-T covered 90% of the country. 24-hour broadcasting from Kaaba (Holy Mosque) particularly for Hajj had been implemented and a number of replacement technology projects had been completed. RTPRC-China stated that it had merged radio and TV operations. Considering that the Internet is global but broadcasting is local, broadcasters needed to be stronger to compete, therefore close co-operation was required.

Next, the session focused on emerging technologies. KBS-Korea explained that ASO would be fully achieved

on the 31st of December 2012 and KBS would start dual stream 3DTV, Hybrid 3D (B/C+Internet) and OHTV trials next year. NHK-Japan stated that Super Hi-Vision had been utilised at the London Olympics 2012. Currently, trials were going on to initiate broadcasting in 2016. The target technology being 8k. Currently post production cost was 3-5 times that of HD due to new equipment, however it would soon be similar to HD cost. TVB-Hong Kong explained that they were upgrading the news to HD this year. Other technologies such as catch-up TV were being implemented and ASO would be implemented at the end of 2015. Additionally the coverage of DTT was being improved. DDI-India referred to digital archiving in New Delhi which was expanding to five centres. RTM-Malaysia reported that a file-based transmission system had been installed, but that adapting to new workflows was difficult. They were also coping with an HD upgrade. RTR-Russia explained that they were managing 20 digital channels in Moscow and other forms of distribution were increasing. However, they could not have the same technology in each province because of geographical problems. RTR facilities were ready to go to HD but final transmission, except sports channels that broadcast via satellite, was still in SD. TDM-Macau informed that they now had a new HD studio with LED lighting.

At the end of the session, John Bigeni of DVB highlighted the astounding success for DVB-T2 take-up. He said that, initially the cost of receivers had been 100 USD, but now, those were as low as 23 USD which was close to matching the DVB-T cost levels. Lindsey Cornell of the BBC stated that cost reduces with the market size and that now DAB+ costs had come down to DAB levels.

Special Topic Session by KBS: A Peep into the Future



N-Screen Technology and KBS' Strategy

The Special Topic Session this year was presented by KBS-Korea with the theme "N-Screen Technology and KBS' Strategy". The session included three very exiting presentations made up three experts from KBS.

The first one on "Current and Future Issues in N-screen Media Services" by Dr Byunghee Jung of KBS Technical Research Institute highlighted that the media services in Korea are being transformed to meet the demands of the users who want to watch and listen to the content using a personal device and sometimes while watching it together with TV sets in living room. Users would like to perform multitasking with TV set, e.g. e-mail, web-surfing, connecting other via social networks, etc. Current N-Screen services by KBS are geared towards providing a similar experience to the user. A converged media experience with live streaming, catch-up services, Hybrid TV experience, Smart TV solutions and Mobile Web based content for mobile devices. In moving forward the platforms need to be further enhanced to improve user satisfaction, provide more interactivity, make the distribution systems more efficient to reduce the bandwidth usage and in turn the costs for the user and provide more monetising opportunities for the content providers and operators.

The second topic on "OHTV (Open Hybrid TV) Status in Korea" by Dong June Lee KBS Technical Research Institute looked at the convergence of the terrestrial and internet platforms in providing a more enhanced experience for the user. The

idea behind the hybrid approach is to provide synchronised content on both platforms to the same television set. In Korea this hybrid broadcast system will be launched early next year with manufacturers like Samsung and LG having made TV sets ready for OHTV service. Standardisation of OHTV (version 2.0) will start in 2013, which would have features like ACR (Automatic Content Recognition), Remote UI (DLNA), TV Centric Interactive Services like 2nd TV screen or the smart link TV, HTML 5 based open web platform support and other enhancements.

The final presentation on The Strategy of KBS N-Service 'Player K' by Hong Seo Park of KBS New Media Center highlighted that Player 'K' had been developed by KBS with the idea of providing a reliable and open marketplace for content, cost effective delivery infrastructure, support for advanced multiscreen media environments and giving more business opportunities for broadcasters through local and region content. The player K platform will be independent of the screen, the platform, the browser used and the delivery method employed. With improving broadband network, fixed or mobile, broadcasters have to prepare their platform to adopt the change, not only for broadcast, but also to provide content over broadband. Future services would not be one-way like the traditional broadcast but more interactive and personal. 'Player K' will work on this interactive model providing a content hub using intelligent and flexible transcoding methods to adopt the stream to fit the screen, the format, the device and the format required for the end user.

DB Forum Seeks Cost Effective Equipment

This year, 35 broadcasters from ABU member organisations and industry partners attended the forum meeting. Ms Lim Soh Kwang, RTB-Brunei was the Chairperson. She reported the activities that were carried out last year which included the Festival of Technology Webinars, PMP conference, workshops in different countries, technology trials, Digital Broadcasting Symposium and technical advisory missions. After the report, four enlightening presentations were delivered.

Aaron Hee of Sony Professional Solutions Asia Pacific presented, "Cost-Effective SD to HD Studio Migration". He provided a roadmap for the developing members on how to set up HD studios according to the facilities of the

broadcaster. Dr Sang Jin Lee, SBS-Korea, explained the experiences of KBS in 3D technology, with his presentation titled with, "SBS Trial of 3DTV". Scott Stull of iBiquity Digital-USA made his presentation on the subject, "HD-Radio and Cost Effective Broadcasting". He shared experience in America and in the industry, explaining the advantages and disadvantages of digital radio. Bahadır Gurler of ABU reported on last year's TAS missions which were taken up in different regions of the Union and mentioned about new TAS targets.

At the end of the meeting, the Chairperson announced the activities that had been planned by ABU Technology for the coming year.



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DR Forum: Emerging Broadcasters Face Challenges



The ABU Digital Radio Forum provides a platform for members to network among themselves and with other industry players. The forum had its annual meeting this year in Seoul as part of the Technical Committee meetings.

The Forum Chairman, Asaad Sameer Bagharib of Mediacorp, provided details of the activities that were carried out in the past year. He updated the meeting on digital radio developments in different systems and highlighted some of the radio related ABU events. He mentioned the DRM Consortium Webinar on Emergency Warning and the DAB+ digital radio trial that took place in Indonesia in September. The programme of activities planned for the year ahead was also presented to the meeting.

Four interesting presentations were also made.

A presentation on, “Digital Radio Plans in Korea” by Dr Yong Tae Lee of ERTI-Korea, looked at the combined trial and study conducted in Korea with all the three digital radio standards, including DAB family, DRM family and HD Radio. The results

of these studies were presented to the meeting, highlighting the performance of each standard. It was mentioned that, based on these results, an official announcement of the standard which Korea will adopt will be made soon.

The presentation on “Radio Broadcasting in the Pacific – Trials and Triumphs” by Solomone Finau of TBC-Tonga focused on the issues and challenges faced by Tonga and other countries in the Pacific. Although the Pacific Island countries are looking forward to move towards digital, he mentioned that they need assistance and support in many areas such as expertise and trained staff. It was noted that TBC-Tonga has launched an internet based radio service of its own, targeting the country’s population living overseas.

“Update of DRM in Asia Pacific region”, by Mrs Ruxandra Obreja of DRM presented the latest developments and DRM implementations in the region. She specifically highlighted the developments taking place in India and suggested that the uptake of DRM in India will be very beneficial for others in the region as it will help in the mass production of receiver sets, making them more affordable.

The final presentation was on the “Lessons from the DAB+ Demonstration in Jakarta” by Jorn Jensen of WorldDMB Forum. It addressed the successful trial that was carried out in Jakarta-Indonesia last September. The 4-day event comprised of a DAB+ technology workshop followed by a field measurement exercise conducted in and around the city of Jakarta. The presentation also looked at the recommendations; providing a set of guidelines for broadcasters who wish to embark on implementing digital radio services in their countries.

Implementing New Platforms in Asia-Pacific

The ABU Technical Bureau had its annual meeting in Seoul the day before the TC meeting. The bureau carried out a full review of the activities carried on behalf of the Committee by the study projects, various groups and forums and the Technical Department.

Other highlights of the meeting included discussions on the frequency spectrum front leading to the recommendation on “preservation of the frequency spectrum for broadcasters”. It also decided to take up two additional tasks in the relevant projects and groups to look at; identifying common elements

of the Hybrid TV platforms for digital applications in the Asia-Pacific; and in formulating a roadmap for UHDTV implementation in the Asia-Pacific region. These two tasks will be considered under the Transmission Topic Area and the Next Generation Broadcasting Services Advisory Group respectively.

The Bureau also decided to have a further look at the judging criteria for the Engineering Excellence Awards and also to work on devising an action plan based on the recommendations from the Advisory Group on Strategic Issues.

Based on its studies, deliberations and the work done by ABU Technology, the Bureau considered three decisions and a recommendation to be put forth at the TC for consideration and adoption this year.



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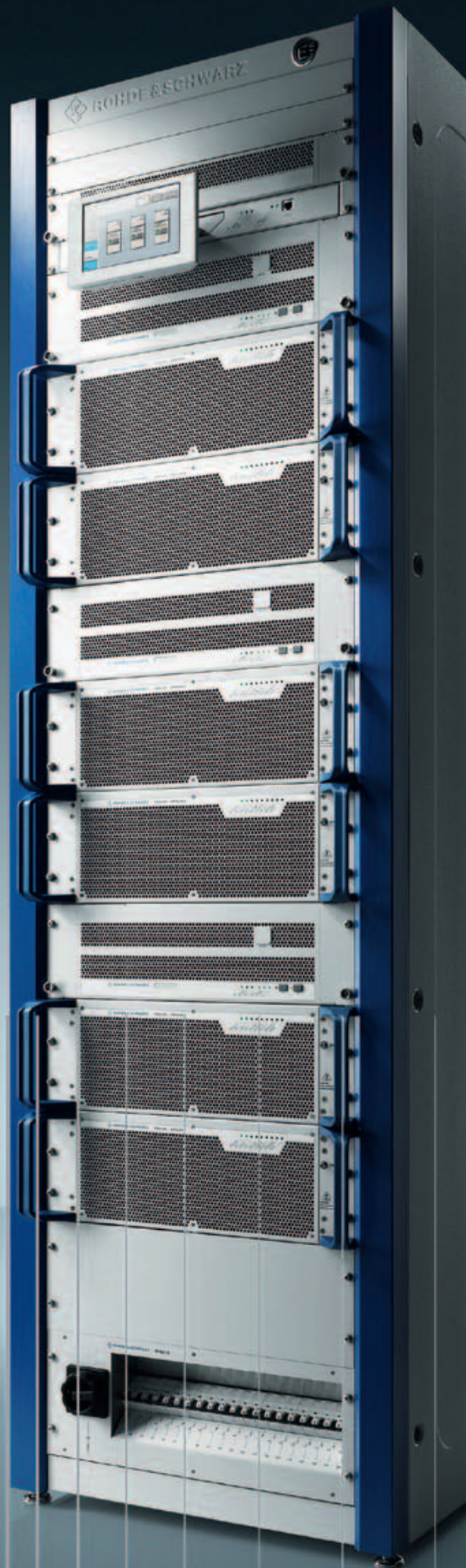
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Informal Forums: New Future of Broadcast Platforms

The session on Smart and Hybrid Broadcasting was presented by Dr Young-Woo Suh, Principal Researcher of KBS TRI. He highlighted the influence of social media and the convergence among the delivery methods of broadcasting such as Hybrid, UHDTV, DVB-T2 and 3DTV. He also stressed the importance of the relationship between Hybrid broadcasting and smart devices. He made a comparison between smart applications on the Android and Apple systems in terms of security, controlling and quality. Dr Suh addressed the advantages of the new trend in broadcasting as Non-Real Time Service (NRT), Mobile DTV/DMB, HbbTV, Open Hybrid TV (OHTV) and Smart DMB.

“The Exciting Future of Content Delivery with Smart Apps” session was moderated by Lieven Vermaele, Director Technology and Development of EBU. He explained the quality evolutions of television formats from 1990s up to 2020s and divided media services into three parts as linear media (audio-video), non-linear (VOD, PODc) and Multimedia/Social (web, social). He said that Hybrid TV covers all these three shared services. He also mentioned about the interactivity and personalization of “Second screen” considered as personal services as Smart applications. Mr Vermaele approached these services from the technical and delivery perspectives and pointed that the future will belong to broadcast and broadband together.

The session on N-Screen Platform presented by Dr Sam Mo Cho, Deputy Chief Engineer, SBS-Korea, looked into a platform called “Pooq”, something which means as the most convenient way to be completely involved in content. Pooq, a combined effort from the major broadcasters in Korea, initiated by MBC and SBS with KBS and EBS joining as content partners, and was launched in July this year. It is available on smartphones, tablets and other devices with 27 channels of which 10 are available on Pooq only. Pooq has 40 live channels and more only available on demand (VOD) and already has over a million hours of content available to its viewers. Currently in its first phase is available for PC and other mobile devices, and will expand in 2013 to Connect TV and OTT platforms.

The session “Datacast Services Available via Broadcast and the Internet” was presented by Takeshi Yamada, Media Services Engineering Division, NHK-Japan. Mr Yamada explained the transport, display and personalising of Datacasting System and its implementation in Japan. He defined the NHK Net Club which has two million members and the link between this service and NHK’s digital satellite and terrestrial TV channels. He also stated that 100 million TV sets of datacast combined with Internet and perform the Hybridcast service in the country.

The session on Implementation of DVB-T2 was presented by John Bigeni of DVB. Mr Bigeni said that DVB-T2 is generating huge world interest and growing fast because of

the transmission efficiency, increased number of services, robust coverage and significant spectrum savings. He also compared DVB-T2 with DVB-T in terms of coverage, payload, efficiency, network savings, transmission gain and reception.

The session presented by Abdel Rahim Suleiman, Technical Director of ASBU and Simon Pryor, Product Marketing Director-Newtec with the topic “New MENOS and ASBU Usage”, looked at the current status of MENOS system and how it is being used by the broadcasters in the ASBU region. MENOS with its IP infrastructure provides a lot of possibilities for the broadcasters. The service covers the ASBU region using the Arabsat 5A and 5C Satellites on Ku and C-band respectively. The technology is field proven and it is made available at a very affordable cost to all on a pay-per-use basis. With an easy to use Arab and English user interface it also provides end-to-end VoIP coordination channels. MENOS is used for radio and TV services, both live streaming and on demand basis, distance training, video conferencing and mobile solutions like DSNG and FNG flyaway using advanced MPEG 4 AVC codecs. As of now MENOS has over 108MHz capacity on the Ku band with 292 active terminals, daily content exchange of 15 hours with over 10,000 news items exchanged in 2011 alone. It has now increased its services to the members of the African Union of Broadcasting (AUB) with 48 member terminals currently in use. MENOS has been evolving since its inception and with the use of advanced technologies new features like blended file and live streams, hybrid satellite and fiber network system extending its footprint further and adaptive bit-rates for effective bandwidth usage, all of this allowing users to add extra services and users with same capacity.

The forum session on “Main issues in Digital Radio Broadcasting using Enhanced System Standards” was presented jointly by Mrs Ruxandra Obreja, Chairman-DRM Consortium and Jorn Jensen, President of World DMB Forum. The session focused on the main issues pertaining to the take up and roll out of digital radio, with the two presenters looking at radio going digital as a whole and the benefits it will provide both to the users and the operators in terms of cost, coverage, additional capacity, improved quality, enhanced experience and many more other possibilities. It looked at the internet delivery platform which has become very common now with almost all major radio services around the world available on these IP platforms. It was said that internet or IP based radio platforms currently operate as a supplementary service to the normal broadcasts and it will still remain the same in the future with digital radio services been available, because of the point-to-point limitations in connectivity and costs involved in broadband usage. It was said that current FM radio provides a good quality radio experience, but with its limitations and the demand from the audience for a more enhanced experience digital radio platforms will be the way forward for the future.

Technical Studies at the ABU

The Technical Committee's 26 Study Projects are broadly categorised under study topic areas Production, Transmission, Training and Services, and Spectrum. In addition to these the Committee has setup groups and forums that address specific areas like the Digital Radio Forum, Developing Broadcasters Forum, HD Advisory Group, Advisory Group on Technical Strategic issues, EWBS Task Force and the Next Generation Broadcasting Services Advisory Group.

At the Seoul meeting, the results of the studies summarised in the following:

In the Production area, standardisation of metadata for archiving was addressed, which has also been initiated by MPEG and ISO. The group will shortly carry out a survey to understand the requirements from members. Other areas include the standardisation of UHD TV by ITU-R and the work carried out by ITU-T Focus Group on Audiovisual Media Accessibility pertaining to systems for people with special needs.



In Transmission, the key project is DTTB coverage and frequency planning. The studies have pointed out requirements for channel re-stacking which many spectrum regulators have mandated for the TV broadcasters in the

UHF spectrum. Mobile Multimedia Broadcasting and using the Smart Apps to access content via mobile broadband were also addressed.

The Training and Services area addressed areas of training and capacity building, low-cost infrastructure and equipment, and support to developing broadcasters, particularly in migration from analogue to digital broadcasting and mobile.

The Spectrum Topic Area has initiated projects based on the agenda items of WRC-15, following studies at the ITU and regional groups. The outcome of WRC-12 was addressed. An important development at the last WRC-12 was the decision by Region 1 countries to take another slice of what are the frequency bands used for broadcasting and give them to mobile services. There is a growing pressure across the world from mobile operators to make use of the spectrum that has hitherto been assigned for analogue television broadcasting.

The Next-Gen Broadcasting Services Advisory Group looked at the developments happening in Hybrid TV, 3DTV, UHD TV and other parts of the new media landscape. Two specific technologies highlighted were the practical use of Super Hi-Vision with large capacity transmission technology for terrestrial broadcast. The other area was High Efficiency Video Coding (HEVC) also known as H.265, which is jointly developed by MPEG and ITU-T VCEG. HEVC is aiming to deliver the same picture quality at half the bitrate of H.264/AVC but requires higher computational complexity to perform.

WBU-TC in Seoul: Addresses Spectrum Issues

The Technical Committee of the World Broadcasting Unions (WBU-TC) met on 11 October morning in Seoul on the sidelines of the ABU annual meetings. Representatives of the EBU, ASBU and the ABU participated. The meeting was chaired by Yeo Kim Pow.

The meeting focused on two main issues; Frequency Spectrum in the Broadcasting Services (brought forward by the ABU) and Unregulated Sharing of the 3GHz Band.

ABU presented a draft recommendation on "Preservation of Frequency Spectrum for Broadcasting Services" along with a discussion paper providing background information.

Abdulrahim Suleiman (ASBU) agreed to the points raised



in the discussion highlighting the importance of such a recommendation and how to get the broadcasters to play a more aggressive role when national regulators are concerned. He explained the similar position and support of ASBU with this recommendation.

Lieven Vermaele (EBU) agreed with Mr Suleiman and noted the importance of having such a recommendation. He explained the situation in EBU and how they are trying hard to get broadcasters more involved with the national spectrum regulators in spectrum planning so that their voice is also heard at ITU conferences.

The document, updated as a result of the meeting, was presented to the WBU meeting on 18 October.

Ahmed Nadeem (ABU) mentioned the unregulated sharing of the 3GHz band currently used for the satellite downlink and the rising issues among its users with various kinds of interference and difficulties. Mr Suleiman explained the situation in the ASBU region where satellite broadcasting is widely used and that this is causing them a lot of trouble. He highlighted that this will be further discussed in their coming meetings and will provide feedback to the WBU-TC members.

Decisions Taken at TC2012

Decision 1:

Enhancing Technical Bureau Membership

This Decision responds to the review of the ABU Technical Bureau membership to reflect the increase in the ABU members in recent years and to increase the representation and diversity from different disciplines. The TC decided to increase the Bureau membership from 15 to 18 members.

Decision 2:

Amendment to Excellence Awards Guidelines

The Decision addresses the possibility of increasing the participation and opportunity for more members, particularly the developing broadcaster members, to compete in the technical awards. The TC decided to revise the awards guideline to allow judging based on the impact of

contributions made in the respective organisations and to provide a level playing field for all the members to compete.

Decision 3:

Setting Up of ABU Developing Broadcasters' Excellence Award

The TC considered the lack of participation from the smaller and developing members in the Excellence Awards in the past and the need to provide easy access and recognition to the outstanding contributions by individuals in such organisations. The TC decided to set up a new award, the ABU Developing Broadcasters Excellence Award, targeted at the developing broadcasters within the Union.

Recommendation 1:

Preservation of Frequency Spectrum for Broadcasting Services

This Recommendation addresses one of the pressing issues for broadcasters in terms of broadcast spectrum. The broadcast frequency spectrum, especially in the UHF band allocated for broadcasting is under threat from the telco industry and the broadcasters are on the verge of losing a chunk of it soon. The Recommendation urges that broadcasters and national regulators to work together to safeguard the broadcast spectrum for the future.

TC Elects a New Team

The Technical Committee elections were held on the third day of the meeting. With the TC approving the decision to enhance the membership of the Bureau, there are now two positions available for Associate Members in the ABU Region and four positions for Full and Additional Full members in the A to J category. Two scrutineers from among the affiliate members were appointed for the election process.

The first phase called for election by two associate members from the ABU region. Phoenix TV was unanimously elected in this category. Under the A to J subscription category, NBT-Thailand, MTV-Sri Lanka, EAP-Sri Lanka and TBC-Tonga were unanimously elected. With five seats taken up, there were now 13 seats of the 18 member Bureau left for election.

Since 15 nominations were received for the remaining 13 seats, balloting was carried out. After a successful round of balloting the following members were also elected to the Bureau; RTB-Brunei, RTPRC-China, TVB-Hong Kong, DDI-India, RRI-Indonesia, IRIB-Iran, NHK-Japan, TBS Holdings-Japan, KBS-Korea, RTM-Malaysia, MediaCorp-Singapore, TPT-Thailand and TRT-Turkey.

Two nominations were received for the positions of the TC Chairman and Dato' Abu Bakar Ab Rahim (RTM) was elected.

For the three posts of Vice Chairmen, Masakazu Iwaki



(NHK-Japan) sought re-election for this post and was unanimously re-elected. W B Leung (TVB-Hong Kong) and Hamid Nayeri (IRIB-Iran) were unanimously elected. Nguyen Duc Tue of VTV-Vietnam was announced as the Honorary Vice-Chairman for 2013.

The meeting was then presented with the names of the Topic Area Chairmen for the four Study Topic Areas as proposed by the Bureau for the Committee's approval. These were approved and appointed without any objection. Shuji Inaba (TBS TV-Japan) for Chairman-Production Topic Area, Masayuki Takada (NHK-Japan) for Chairman-Transmission Topic Area, Tharaka Mohotty (MTV-Sri Lanka) for Chairman-Training & Services Topic Area and Mrs Zhu Yunyi (RTPRC-China) for Chairman – Spectrum Topic Area.

Keynote and Invited Presentations

Megatrends of ICT: Its Implications to Broadcasting

The keynote address this year was presented by Dr Kiho Kim, the Executive Vice President of Digital Media and Communication R&D Center at Samsung Electronics. He looked at the beginning of the computer and digital age, how it has revolutionised its use and how the devices have become smaller and smarter over the years. The presentation focused on how the internet has evolved and changed the way we communicate today, how it has moved out content from the packaged physical media to networked media and the realisation of cloud computing, highlighting the dominant players in this revolution. Then he looked at the mobile revolution that is taking place now with smartphones and other mobile devices being packed with enough power to rival the desktop computers, noting how everyone wants everything to be made available on these devices working and interacting while being on the move. The world has evolved from being digital to being networked, to being mobile and now the trend is towards being more intelligent. The trend now is to have high performance devices that are smart, interactive and intelligent and based on open platforms.

NHK's Coverage of London Olympics and SHV Public Screening

This invited presentation by Dr Keiichi Kubota of NHK, provided a comprehensive account of NHK's coverage of the London Olympics HD Broadcasting, live streaming VOD and SHV public screening. The HDTV Broadcasting Services started on 26 July 2012 and up to 13 August 2012 covering three broadcasting methods such as Terrestrial TV, Satellite TV and Radio Broadcasting totally 729 hours. The Live Streaming Services broadcast 20 sports events that were not live on TV, but were accessed from PC and smart devices through eight channels. The streaming was delivered by using both the Content Delivery Network (CDN) and the "Peer to Peer Network". The total hits on the services was more than 339 million counts. The VOD or Catch-up TV Service or "NHK on Demand" is the service through which the audiences could view the archived programmes according to their requirements. This Catch-up service was available 12 hours after the broadcast time. The number of programmes

is 193 with 292-hour time and has a total audience of 94,644. The services provided by NHK also include the Data Broadcasting Service and HD Video Clips. The Data Broadcasting Service retrieved the Official Olympic Records from IOC and showed them in real time along with the events schedule and latest broadcast schedules. The Super Hi-Vision (SHV) or Ultra High Definition TV (UHDTV) is television with 16 times higher resolution than HDTV and has a real 3D sound of 22.2 multi-channel audio. The standardisation of UHDTV is ITU-R BT.2020 (2012). The UHDTV public screening was held on 27 July – 12 August 2012 in UK, USA and Japan. The international transmission between the Play-out facilities and the Public Screening area was done over a Gigabit IP network. The 350 Mbps uncompressed transmission (TS(280 Mbps)+FEC) between Olympic Park and BBC in London used the DWDM technology. The public screening of UHDTV had a total number of participants in all three countries of 227,500 persons. In his conclusion, Dr Kubota explained the schedule of a UHDTV trial which was scheduled for 2020. Due to the success of the public screening in London, NHK may shift the UHDTV trial earlier in 2016 which is the time of Rio Olympics. Beyond the UHDTV Broadcasting, NHK has planned, in the next 18 Years, to launch the Spatial Imaging 3DTV which could display natural 3D images that do not cause visual fatigue.

Digital Radio in Europe and Asia-Pacific

A presentation on "Digital Radio in Europe and Asia-Pacific – Trials and Triumphs", was made by Lindsay Cornell, Principal Systems Architect at BBC Future media. He mentioned that digital radio started 20 Years ago when BBC started the demonstration DAB system in the UK in 1993. He looked at the different digital radio standards starting with DAB, that was standardised in 1995 and which later extended to DMB and DAB+, the ISDB-TSB which later evolved to ISDB-TMM, HD Radio and DRM system which has later grown to DRM+. The UK trial moved ahead and by 1997 they had transmitters providing services to all the major cities with both regional and local content. The other countries in Europe to move ahead with digital radio soon after were Norway and Sweden using digital Radio in DMB standard. The

DRM consortium was formed in 1998 and the standard was published in 2001, mainly as an international broadcasting standard in the shortwave and AM bands. Major trials of the standard were carried out in India, Thailand, New Zealand and others proving its quality to be much better compared to the traditional shortwave and medium wave systems and used significantly lower power to achieve similar coverage. DRM used the more efficient HE AAC V2 encoding compared to the Mpeg1 layer2 used in the original DAB standard. The DAB+ standard,

using the advanced encoding methods was published in 2007 and Australia and Switzerland announced that they would be moving with DAB+. The BBC and France also moved towards DAB+, making the DAB and DAB+ the standard of choice for most of Europe. In the Asia-Pacific Australia and Hong Kong announced adoption of DAB+ early with many other countries like Malaysia and Indonesia having successful trials. DRM has been the choice of India and Russia, and this may be a strong driver for this standard in the region.

CTO Forum Addresses Digital Migration

The CTO Forum, held on 14 October, focused on important issues that arise in migration to digital broadcasting. The CTO Forum Session was moderated by Prof. Dr Du Baichuan.

Speaking from the panel, Dr Ha Kyun Mok, KBS-Korea, referred to cloud computing systems. He said that users could shift their work location by means of cloud computing and mobile devices with the help of cloud-based production and cloud storage. He also reported that KBS was using N-screen which harmonised the roles of both cloud service provider and broadcasting service provider.

Dr Keiichi Kubota, NHK-Japan, explained Hybrid broadcasting technology, which combines contents and technologies of broadcast and broadband. He mentioned Super Hi-vision which was 16 times better than HDTV in terms of quality. He stated that broadcasting standards should continue develop and NHK was continuing its contribution with a responsibility for future generations.

Chris Grey, Sony-Hong Kong, explained the process of the last 30 years of broadcasting from the manufacturer's perspective. He said that business changed in all kinds of ways especially in moving from hardware solutions to software solutions. The manufacturers were struggling to meet the requirements of the end user.

Dr Riyadh Najm, Ministry of Culture & Information-Saudi Arabia, mentioned the threats to the frequencies of UHF and C bands which were being progressively occupied by mobile services. He also stressed the challenges faced by broadcasters and consumers in terms of keeping up with the rapid changes in technology. He stated that convergence between media and telecom services had created a lot of confusion between broadcaster and consumers.

Dr Gerard Faria, Teamcast-France, explained that broadband would not be able to replace broadcasting. Stronger



cooperation and sharing the links between broadcaster and broadband would help both sides to improve and also to use the spectrum effectively.

Lieven Vermaele, Director Technology of EBU, stressed that broadcasters had a fundamental role of being the "media of public" that served and created new quality of services for everybody. He said the EBU was handling projects to address four main points: Reducing the costs; placing the standards in order to reach as many people as possible; quality of services and experiences and maintaining strategic positions. He also stressed that broadcasters should work together to build the framework for the future innovatively.

Dato' Abu Bakar, RTM-Malaysia, explained the problems broadcasters commonly faced in training their staff, in migration to digital and managing new systems. He said the market was highly competitive in the acquisition of advanced broadcasting technology.

At the end of the session, Prof Dr Du Baichuan stated that convergence with the Internet, like OHDTV and HBBTV, should be the long term strategy of the broadcasters, to maintain their position in the multimedia world.

Technical Information Workshops

National Assembly Election Using Kinect System

Tae Min Chung, Visual Effects Supervisor, KBS, explained the “K-motion” system using Kinect cameras. Kinect camera consists of IR emitter, colour sensor, IR depth sensor and a tilt motor. The system detects the skeleton information, tracks the movement of the body and acts according to hand rotations. Mr Chung expressed that it is an interactive system because the graphic is controlled by the movements of the user’s body without the requirement of a specific marker. The K-motion system was developed by KBS for broadcasting use and the first trial was for the 2012 elections in the country.

“The Digital Dividend” for Whom?

Yim Zungkon, Principal Research Engineer of KBS explained in detail the Digital SwitchOvers which have been carried out in different countries. He reminded that “digital dividend” is the release of spectrum after an analogue service has been closed down. The digital dividend is 72Mhz for Europe and 108MHz for Asia and America. He also reported that Europe is asking members to designate the 800MHz band for wireless broadband services by 1 Jan 2013, however the USA had completed the process of auctioning the 700 MHz band in March 2008. For Japan, MIC allocated 718~748MHz (30MHz for mobile) and 773~803MHz (30MHz for base station). He expressed that Asia-Pacific broadcasters are faced not only with digital dividend issues but also TV white spaces issues, therefore the ABU has to actively protect the Asia-Pacific TV viewers’ rights in the international field.

Modern Production Facilities at ZDF

Tobias Schwahn of ZDF-Germany described several technical revolutions in ZDF as file-based production, IP-based contribution and High Definition TV. He mentioned the SAW project that includes the complete renewal of the Playout centres and multichannel-processing in one centre. ZDF is now using full file-based workflows, full HD, central ingest for playout material, file-based quality assurance

and digital archive for Hi-res. Mr Schwahn also described their new MCC project including compression for broadcast and Internet transmissions (Live streaming and HD/SD simulcast), multiplexing of broadcast signals for satellite, cable, DTT, IPTV and the delivery of ASI native (satellite) and IP streams. With the ÜZ Project, ZDF renewed the central signal routing infrastructure, master control rooms and components for 3G operations. Another project that ZDF has completed is INL which provides file transfer (MXF) among the studios, interconnection of locations in the country, IP-based network for office communication and VOIP. Finally, he described the DAS II project which involves a file-based archiving system and the digitalisation of 300.000 hours of taped material, quality assurance of incoming files and redesign of the central media asset management system.

DVB-T2 Regionalisation within SFN Using PLP Substitution

Colin Prior of Enensys explained the concept of PLP substitution in DVB-T2 services. He said that local content is a standard requirement in DTT networks. Around 50 percent of the services are typically regional channels and in SFN, the local channel insertion should be done in a deterministic way to facilitate the SFN broadcast operations. As satellite is the standard method to distribute T2-MI feeds to transmitters over large areas and using standard TS multiplexing the satellite distribution of common services is replicated and that has a big impact on the cost. Therefore PLP solutions enable local content insertion in SFN and optimise the distribution network capacity. Mr Prior compared Multiple Frequency Networks (MFN) and Single Frequency Networks (SFN) in terms of content, frequencies used, bandwidth occupation, cost and showed the advantages of SFN. He explained that the DVB-T2 standard-based solution uses multiple PLP features; each PLP containing a transport stream of either national or local services. Moreover, PLP substitution provides flexibility to broadcast different local services in the same SFN cell using different modulation parameters with reduced coverage.

Sharing Media Technology Solutions with Regional Broadcasters

Asaad Sameer Bagharib, MediaCorp, looked at the changes that had taken place in past years in terms of developments in technology and MediaCorps achievements in becoming one of the top media companies in the region. MediaCorp Technologies operates most of the technical facilities like transmission, satellite links, DSNG’s and OB services for its various channels and has extended its services to support various other broadcasters in the region with media technology solutions. The presentation highlighted some of these projects taken up by them in the past including those in Myanmar, Vietnam, Singapore and the HD OB production trailers for MediaCorp. With their years of experience and knowledge of advanced technologies in use MediaCorp Technologies were involved as consultant



and project managers for these projects. In addition to these they have supported many local and international events in terms of host broadcast and production support. MediaCorp Technologies believes that other broadcasters in the region can support each other in a similar way sharing each other's experience.

Video Transmission System Using Wireless IP Transmission

The presentation, made by Masakazu Iwaki, NHK, looked at the possibility of enabling IP connectivity with conventional microwave links. If these links can be made to work with IP then it will be easy to handle multiple video streams and other data applications. It can also be used to connect to other IP networks to extend the transmission path easily. Conventional microwave links use strong error correction and diversity reception to provide a stable video transmission using a fixed bitrate. Although this provides robust transmission the fixed bitrate remains in the lower level and the bandwidth is not utilised well. NHK labs have developed a video IP transmission system which adapts to available bandwidth and controls the video encoding bitrate. The new technique uses the wireless link information obtained from the wireless receiving device to control the delay caused by sudden drop in bandwidth which is common in wireless environments. This method allows

continuous video transmission without any interruptions. Transmission evaluation tests have been carried out in outdoor environments and the results confirm stable video transmission in such conditions.

UMID and its Applications for AV Material Management

Yoshiaki Shibata, metaFrontier-Japan, presented this topic which looked at Universal Material Identifier (UMID) and its role in the file-based application environment and in audiovisual (AV) material management. UMID is a special code that is used to identify AV material and is a core component in tagging of content to enable reliable access and tracking. The main purpose of UMID is to identify and locate material in storage systems, to provide constant identification throughout production, archival storage, transmission and dissemination. It is a unique identifier that is automatically generated and provides a reliable link between the essence and metadata. It allows the management of programme copies and even unfinished materials. UMID has played a key role in the success of open-source file interchange formats like MXF (Material Exchange Format) /AAF (Advanced Authoring Format) and is today supported by leading manufacturers in the AV industry. It was standardised by the SMPTE in 2000 and was revised in 2004.

2nd Workshop on Digital Broadcasting in Yangon

The Workshop on Broadcasting Technologies for the ASEAN Region, jointly organised by the ABU and Forever Group of Myanmar, was held from 19 to 21 November 2012 in Yangon, Myanmar. The objective of the workshop was to expose the broadcasters of ASEAN countries to modern technologies.

Key players in the broadcast industry were among the resource persons, presenting the relevant broadcasting technologies, their implementation methods and technology updates. The areas addressed included digital broadcasting standards, advanced digital broadcasting systems, development of roadmaps for digital broadcasting implementation, modern and high efficiency transmitter technologies, infrastructure development and planning, digital radio features and enhancements, file-based production systems, media asset management and archiving, strategies in delivering free-to-air and pay-TV services over digital networks.

This annual event, the second in a series which began last year, was jointly organised by Forever Group and ABU



Technology. The event comprised eight pre-conference workshops followed by a full day conference addressing all aspects of technologies related to broadcasting, through acquisition, production, integration and distribution in both digital radio and TV. The event was attended by over 100 participants representing broadcasters and technical professionals from Myanmar and across the region. The workshops and conference sessions were addressed by over 15 experts and professionals from around the world.



NEXT-GEN MEDIA SPACE AND THE CONNECTED WORLD



In the connected world, Connected TV, enhanced OTT, use of 3G for video, mobile broadcasting and content via Smart Apps have put new devices in the hands of the consumers, generating demand for innovative services. Some of the new system standards are now being set by the manufacturers or by closed groups of industry players, which may give rise to accessibility concerns.

In the current media space, the 'near future' services like Ultra-HDTV, high scan rate TV and 3DTV cannot be ignored. Audiences are now demanding full-scale HDTV from their service providers. Ultra-HDTV is also expected to capture the imagination of the audiences and prove an instant hit. 3DTV will eventually follow the same path.

While the industry is in constant change, the industry players have to move forward. The broadcasters need to assess the situation and take definitive initial steps.

The 2013 ABU Digital Broadcasting Symposium will address all these issues, bringing together world experts from the entire broadcasting industry.

SAVE THE DATES and join us in Kuala Lumpur for the four-day conference programme, specialist workshops, associated events and a comprehensive exhibition.

Outlook

Radio is Not Going to Go Down

Many industry experts are quite pessimistic about the future of radio broadcasting. This assessment is based on the changes taking place in the media space and the apparent role of radio. However to many of us, this apprehension is misplaced.

Implementation of digital technology has brought dynamic changes in the media space, something that is known as the “digital wave”. The digital wave is positively impacting the radio industry as well.

Many radio broadcasters have added new dimensions to their service offerings, including digital radio surround sound, enhanced aural quality, visual imagery on radio sets, web streaming, content time shifting and hybrid radio. Radio broadcasters are wooing audiences across the social media platforms and have started making use of smart apps. FM radio reception on mobile phones has brought about a transformation in the consumption of radio content.

To meet the upcoming challenges, the radio broadcasting industry needs to harness the power of Internet delivery and provide an increasing amount of information to people, which can be used in their daily lives. Connected radio provides specific information that enriches sports and other content. Potential changes in radio programming need to be made to integrate these with the social networks.

Industry experts believe that continuing enhancements in the quality of content will keep the broadcasting industry moving forward. This very much applies to the

quality of radio content, both in terms of innovation and technical excellence.

Radio is everywhere and it connects people. The vast reach of radio on the AM and FM waves and also on shortwave is a valuable facility, that the radio broadcasters can depend on.

Community radio is a huge powerhouse of untapped synergy. Investments in terms of system implementation, content creation and local human capacity building need to be addressed. If this untapped potential is harnessed, it will provide a huge shot in the arm for the industry.

Smart apps are a great way to pull radio and multimedia content on smart devices and hybrid radio. So these provide a new method for selection and consumption of content.

The radio receiver is no longer a stand alone device but is a part of many other household devices and can perform a variety of functions.

While radio content is all about telling a story, raising awareness of climate change and environment issues has emerged as a new challenge for radio broadcasters. The radio industry provides a service that is of great importance to the public at large and potentially results in saving human lives. Radio is thus the most important and a powerful means of communication in the event of a crisis.

Clearly radio faces lots of challenges but it also has lots of opportunities on the horizon.

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

Additional Full Members

Educational Radio and Television (ERTV)

Educational Radio and Television (ERTV) was founded in 1969 in Kabul, Afghanistan. It is a national free-to-air station involved in production and broadcast of quality software for education and is fully funded by the Government of Afghanistan. It has an exclusive television channel and FM radio station for broadcasting educational television programmes for a period of twelve hours a day and twenty-four hours radio broadcast services. ERTV's main activities are the production of education radio and television programmes.

The National Assembly Radio and Television Broadcasting Station

The National Assembly Radio and Television Broadcasting Station was established in 1994 in Bangkok, Thailand. Both radio and television stations belong to the legislative branch of the Thai Government and are under the supervision of the Secretariat of the House of Representatives. The National Assembly Radio Station began its first broadcast on 1 November 1994. In 1997/98, the radio station network expanded to 14 provinces.

New Members

Affiliate Members

Sports Media Services Ltd

Sports Media Services Ltd was established in 2003 and its registered office is in Pencoed, Glamorgan, Wales, UK. While it was primarily setup as the production wing of the International Rugby Board, subsequently it developed into an independent production company specialising in

Documentary and Sports projects and became the only Welsh company from 2010-2011 to produce documentary programmes for all main-stream national broadcasters such as BBC, ITV and S4C.

Hong Kong Trade Development Council

Hong Kong Trade Development Council (HKTDC) is a statutory body established in 1966 in Hong Kong as an international marketing firm for Hong Kong-based traders, manufacturers and service providers. The company is governed by a 19-member Council of Hong Kong Convention and Exhibition Centre having offices in 40 commercial centres in Hong Kong.

Associate Members

Federal State Budget Institution Russian State Radio Company “The Voice of Russia”

The Voice of Russia was first launched in 1929 and operated under the name of Radio Moscow in Moscow, Russia. It is an international multimedia broadcaster sponsored by the Russian Government, providing a global multilingual information platform in both radio and website information services. Broadcasts are in 32 languages via radio service broadcasts for a total of 179 hours a week, in FM Band, on medium and short waves via satellite and through global mobile communication networks. The Voice of Russia also broadcasts on the internet in 33 languages.

Channel One Russia

Channel One Russia, previously known as Public Russian Television, was registered in 1995. In 2002, Public Russian Television rebranded to Channel One Russia and began as the only channel broadcasting throughout the country. Channel One's activities involve production, voice-over and the distribution of television and radio programmes.

Conference Reports:

IBC 2012

by **Pilipus Purnomosidi**

Head of Transmission Facilitation, TVRI West Java



This year's IBC (International Broadcasting Convention) was held from 6-11 September and was attended by more than 50,000 participants. The event consisted of conferences and exhibitions and attracted visitors and industry players from the broadcasting, entertainment and communication worlds.

IBC is an independent agency partnered with IABM (International Association of Broadcasting Manufacturers), IEEE (Institute of Electrical and Electronics Engineers), IET (Institution of Engineering and Technology), RTS (Royal Television Society), SCTE (The Society of Cable Telecommunication Engineers) and SMPTE (Society of Motion Pictures and Television Engineers). Since 1994, IBC has

been held in the Netherlands as an annual event organised by the industry players in the RAI Amsterdam.

The author was one of the delegates of the ABU (Asia-Pacific Broadcasting Union) to have the opportunity to attend the conferences and observe the exhibitions. This event opened up wider horizons, provided a valuable experience and gave an opportunity to meet with the pioneer companies of the industry.

One of the unique systems displayed in the exhibitions was Encoder and Decoder Vellav UMH252 UMH-160, currently used at TVRI for live streaming of the station area to the TVRI Centre in Jakarta which is connected to 27 regional stations. Through the additional routers, as in Figure 1, live streaming of TVRI stations enriches the diversity of news, entertainment and information on events broadcast nationally by the Center TVRI Jakarta. It is essential and reliable network equipment.

Another interesting exhibit was the Gira PLAN® software which is a module to help in planning a broadcast network and assists in making emission data support predictions. Applications range from analogue TV and FM as well as digital broadcasting systems including DVB-T/H, DVB-T2, DTMB, ISDB-T and T-DAB/DBM. Gira PLAN® also supports the planning of microwave networks, with advanced database capabilities in accordance with the prescribed ITU and CEPT data formats. The software uses the widely used ESRI ArcGIS, a GIS platform with a user-friendly geographical presentation and is in accordance with the Digital Island plan which is one of the placement planning tools for digital transmitters and thus optimal if used with this software.

InterBEE 2012

by **Sary Math**

Senior Technical Officer, National Television of Cambodia (TVK)

International Broadcast Equipment Exhibition, held in November 2012 was an eye-opener for a technical vision of the broadcast world allowing one to experience the newest technology, products, systems and software for the digital network age and the convergence of communication, information and imaging technologies.

InterBEE has been held 48 times since 1965. There is no doubt that InterBEE2012 provided the greatest platform for all visitors to experience the hottest Japanese and overseas broadcast equipment and made available the latest overseas and domestic broadcast equipment, video and audio equipment as well as peripheral applications and technological solutions all in one venue, popularly known as the professional show for audio, video and communications.

Japan was the first Asian country to complete a full transition to terrestrial digital broadcasting by 24 July 2011 last year. Other Asia-Pacific broadcasters are planning to switch off soon, the expansion of the service area and transition of users to digital technologies require a lot of work and experience.

Looking at the event, the continuing growth in television camera technology and matching development in video media; the TV cameras were the stars of the show, enabling visitors to try them out on prominent displays at every booth. Since the digital transition has become a standard for video cameras which are now diversifying towards different poles with 3D content cameras and high-detailed 4K devices for digital cinema, the cameras offer higher resolutions and more features.

On the one hand with more compact business and and on the other SLR cameras, Sony had all kinds of cameras on display,



but the centerpiece of its booth this year was the high-resolution F65 which is equipped with an 8K CMOS sensor panel and can be used to produce in HD to 4K and beyond. With an image sensor equivalent to super-35mm, it has better performance than any previous digital camera and is capable of a high frame rate of 1-120 frames per second and a maximum of five speeds for 24p video production or four speeds at 30p for commercials or TV. With a good dark space SN ratio and gradient reproduction eliminating blown-out highlights and blocked-up shadows, it also has a wide colour gamut, providing a film look. Also, it can be docked with the newly-developed SR Memory recorder, allowing it to record 16-bit RAW data. The manufacturer showed a high quality content shot with the camera on a large screen in a suite with a 4K digital cinema projector. They also displayed a lightweight 3D shoulder camcorder outfitted with three 1/2" CMOS chips that is compatible with XDCAM EX recording formats and media.

In addition, during the InterBEE Tutorial Session, the experts talked about cutting-edge technology trends, the latest equipment and system application methods and content production techniques to the young talent in the broadcasting, video and audio industries as well as students and young engineers who are keen on these fields.

A Report from RTA:

National Radio Television of Afghanistan Broadcasting Archives

by Abdul Rahman Panjshiri

Foreign Relations Director, RTA-Afghanistan

Radio Broadcasting Archive

In 1963, Radio Afghanistan Broadcasting Archive (RABA) was established with the aim of archiving and maintaining the sound records and radio broadcasting material. Currently, RABA stores 50000 Hr (reels), 2000 analogue sound reel records, a collection of CDs and other radio broadcasting material which include:

- 1. Historic Speeches Section:** All speeches, statements, announcements and interviews of the government's high-ranking officials are maintained. Furthermore, this section maintains official statements of foreign presidents.
- 2. Afghan Music Section:** This section includes 6000 Hr (reels) and a collection of CDs, which contains a rare collection of Afghan traditional music.
- 3. International Music Section:** 4200 Hr (reels) of international music and songs are stored. These material are used for program production and basically introducing the international music to Afghan public.
- 4. Research Section:** In this part, scripts of many radio programs, research and concept papers are collected. The material are used for educational and program production purposes.



In order to digitalise the content of Afghanistan Radio Archive from analogue tapes to Compact Disc, two projects were initialized in the past. The first project was implemented with the help of the American Institute of Afghanistan Studies between 2006 and 2007. The second project was funded by INA-France. At the end, 9300 hours of music and radio dramas had been transferred to CDs. However, now the process continues very slowly due to the funding problems.

Television Broadcasting Archive

Afghanistan National Television Archive was established in 1978 being the largest visual archive in Afghanistan,



commonly referred as the visual history of the country. Previously, National TV utilized cassettes such as Umatic-3/4, BCN-1 and AVR-2 inch tapes for broadcasting purposes, however later in 2003, due to the digitalisation of all TV studios, DVC Pro and BETA CAM digital started to be used commonly. With the completion of TV studios in 2004, 6239 hours on 1-inch videotapes, 1561 hours on 2 inches videotapes and 6700 hours of television material on U-matic cassettes have been recorded. These material consisted of political speeches, educational programs, documentaries, films, theaters and dramas.

Between 2006 and 2007, with the assistance of INA, the project of transferring the analogue material to digital format was carried out. However, after transferring of 2700 hours of material, the process stopped and never started again. Since the digitalisation of the TV studios in 2003, 14500 hours of TV material have been archived and almost 3245 hours of analogue cassettes have been transferred to DVC Pro tapes in total.

Currently, RTA holds a large collection of low band Umatic-3/4, BCN-50/51 and AVR-2 videotape recorders which cannot be operated because of technical problems. Technical support is strongly required.

During the years of war, the standard environment to store and maintain the broadcasting material in the National Radio Television Archive was not present. Because of inappropriate temperature and humidity, the material have been damaged or become unusable.

In conclusion, the condition is threatening the Radio Television Broadcasting Archive severely. If the current problems continue this large collection of audio and visual material will be lost soon, and Afghanistan will not be able to preserve its culture to be conveyed to its new progenies.

News

from the ABU Region

China

China Set for More 3D Content

More 3D content is set to explode across TV screens in China, after You On Demand signed a content deal with 3D Content Hub as part of its new Chinese 3DTV service offering, You 3D On Demand.

You On Demand is said to be the “first” national pay-per-view (PPV) and video on-demand (VoD) operator in China; 3D Content Hub is a worldwide distributor of stereoscopic 3D content. 3D Content Hub joins 3net, a US-based 3DTV channel and global production studio, as content partners for You 3D On Demand.

(www.apb-news.com)

Europe

HD-only Sports Coverage for EBU

The London 2012 Olympic Games marked a milestone for the European Broadcasting Union (EBU) – as it ceased SD broadcast of all major sporting events. With the EBU's long term investment in its Eurovision satellite and fibre network, more than 70 EBU members holding rights were able to “flawlessly access” all 12 HD multilateral signals. As part of the network upgrade, the EBU provided its members up to eight MPEG-4 decoders each; aiming to give European public service media and the audiences they serve “optimal transmission quality”. Occupying a sq km of the International Broadcasting Centre (IBC) in London, the EBU ran 12 simultaneous multilateral transmissions and three unilateral feeds for up to 13 hours a day for the duration of both the Olympic Games and the Paralympic Games.

Trial HbbTV Spec for UK

A specification enabling deployed HbbTV capability on devices within the UK DTT system was announced with a test stream. The purpose was to align the UK with the European HbbTV standard in order to work seamlessly alongside the Freeview HD platform.

The publication will also be followed by a ‘roadshow’ of currently deployed HbbTV capability in markets such as Germany. The Digital TV Group (DTG), the industry association for digital television in the UK and an active HbbTV member, has also welcomed the news.

(www.csimagazine.com)

Hong Kong

HK Prepares for Digital Switchover

Radio Television Hong Kong (RTHK) has started test broadcasts in Hong Kong on digital TV services, as the special administrative region of China edges closer to an analogue switchover (ASO) by end-2015. The controller (TV) of RTHK officially launched the testing from the Temple Hill transmission station this year, marking a milestone in the development of the digital terrestrial TV (DTT) service by RTHK.

RTHK operates seven radio channels and produces TV programmes that are then broadcast through local TV stations in the territory. The other three transmission stations, at Golden Hill, Castle Park and Kowloon Peak, are expected to start operation in phases by the first quarter of next year – by which time the digital coverage of the signal tests will be expected to extend to 75% of the territory. The test broadcasts from RTHK comes on the back of the Hong Kong government's announcement last year that the working target for switching off analogue TV services would be deferred from end-2012 to end-2015.

(www.apb-news.com)

Singapore

Free-to-Air Channels to Go Digital

Local television viewers will be able to enjoy their favourite TV programmes in full digital glory by the end of next year. The Media Development Authority announced that all Singapore's free-to-air channels will be adopting the digital (DVB-T2) broadcasting standard by 2013. If successful, this will translate into sharper and clearer images and surround-sound effects for viewers. It is also expected to free up space to speed up wireless broadband connections in homes. The development comes after a trial of 500 households conducted last year to test the suitability of digital signals in housing estates. Both digital and analogue signals will be broadcast together until the switchover is completed in 2020 to allow households to get used to the change.

Thailand

Thailand Looks ‘Down Under’ for DAB+ Expertise

Nine delegates from the National Broadcasting and Telecommunications Commission of Thailand were in

Australia recently to hold technical, policy and broadcaster meetings with key DAB+ digital radio stakeholders because of Thailand's plans to deploy digital radio. Hosted by Commercial Radio Australia, the Thai radio delegation met with their Australian counterpart to discuss the successful switch of DAB+ digital radio in the continent. DAB+ digital radio technology has been implemented in Australia.

(APB)

Worldwide

Broadcasters at Opposite Ends over Social TV Strategy

Television broadcasters around the world are deeply divided over their strategy for social TV. It is generally accepted that social networks and viewer interaction around TV are transforming the TV industry and consumption patterns. A key trend identified by the company in the first half of 2012 is that some broadcasters are moving to counteract Facebook's and Twitter's power over TV audiences. These broadcasters are investing in social TV companies and launching their own social TV platforms for greater control.

Others, however, are partnering with the social networks to facilitate viewer interaction. This is most evident for the kinds of major news and sports programming that viewers discuss on second screen devices during the live broadcast. They have extensively integrated Twitter into their social TV activity, typically by showing hashtags as part of a show's transmission to encourage viewer participation.

For instance, CNN and the BBC both recently announced major deals with Facebook, which has developed a new and more aggressive strategy of moving into the social TV space, which will enable users to view, discuss and share the video entirely from within Facebook.

(CSI)

Next Generation Handheld Specification

At the 72nd Meeting of DVB's Steering Board, approval was given to a new specification (DVB-NGH). Based on DVB-T2, there are many improvements and extensions in NGH to aid mobile and portable reception. These additional techniques include MIMO (Multiple-Input and Multiple-Output), Time Frequency Slicing (TFS) with a single tuner, non-uniform constellations, improved and extended LDPC codes for lower code rates, more efficient time interleaving and ultra-robust layer-1 signalling. It also covers a hybrid profile where terrestrial and satellite transmission schemes can be combined. The specification will be submitted immediately to the European Telecommunications Standards Institute (ETSI) for formal standardisation and an NGH BlueBook is to be published. Since the introduction of DVB-H, significant changes have taken place in the delivery and consumption of multimedia content. Initially, DVB-H was launched to provide linear broadcast services (e.g., TV and radio) for handheld devices. However, the multimedia content market is going through a profound change from traditional linear content consumption to a wide range of rich media content consumption. This media includes traditional TV (linear), various video and audio content, images and text messages as well as push download to local memory in the receiver.

(www.dvb.org)

Digital TV Implementation Workshop in New Delhi



Doordarshan India (DDI), DVB and the ABU jointly organised a workshop on DVB-T2 Technology Implementation. This was attended by 60 participants from India, Turkey, Sri Lanka, Bangladesh, South Korea, Germany and Thailand from 4 to 6 December 2012 in New Delhi, India.

The event was designed for the Indian TV broadcasters, in particular, those planning to implement DVB-T2 technology in the region. The main objective was to impart knowledge and expertise to these broadcasters on implementation aspects of DVB-T2.

During the three days, the experts shared their knowledge and experiences on DVB-T2 implementation in different

countries and regions, discussed the advantages of the system and reported the results of the trials. Also, at the end of each day, a demonstration gave the participants the opportunity to get practice with this new technology and learn from the experts.

Doordarshan's current terrestrial network, its pilot projects and plans to go to fully digital TV were related to experiences of DVB-T and DVB-H in India. Mr Peter Siebert, Executive Director of DVB provided updates on the digitalisation status around the world. He outlined the main achievements of the DVB Project such as DVB-S2, DVB-C2 and DVB-T2.

The workshop was addressed by 17 well-known speakers from Teamcast, DVB Project, Media Broadcast, Funke, Fraunhofer, Rohde&Schwarz, Ericsson, Harris, Digital TV Labs, T-VIPS, Eutelsat, ST Microelectronics, DigiTag, Enensys, Samsung, and Dolby.



Digital Broadcasting Update

Digital TV

End of Analogue TV Era as Switchover Completes in the UK

The UK ended more than 70 years of analogue broadcasting in October with the completion of digital television switchover. Switchover has boosted digital terrestrial TV (Freeview) coverage to 10 million viewers in reception blackspots across the UK and cleared airwaves for new uses, including the next generation of mobile broadband services.

Digital UK led the co-ordination of switchover, including transmitter upgrades and the viewer information campaign. The Switchover Help Scheme has helped more than 1.3 million older and disabled viewers make the switch to digital TV whilst another transmission company undertook the re-engineering of more than 1,100 transmitter sites. Over the last five years switchover has modernised the terrestrial TV network and ensured that the benefits of digital are available to everyone.

Following the completion of switchover, some airwaves previously used for television will be auctioned for 4G high-speed mobile broadband. 4G is the fourth generation of mobile phone technology, ideally suited for video streaming, e-mail, messenger services and social networking.

(Digital UK)

India's Metro Cable Television, Majority Digitised

The Indian government reports that digitisation of cable television has reached 85% in four metro cities. According to the Government, in the last month there has been a sharp increase in the number of STBs being installed in the homes of people. The Ministry cites examples over the past week, during which the average number of STBs installed has jumped to almost 50,000 boxes per day, while the DTH sector has also been making a steady progress.

The total number of TV households in the 4 metros is around 8.3 million as per the Census 2011. The government passed "Cable Television Networks (Regulation) Amendment Bill" last year to digitize the entire cable television sector by December 31, 2014.

(Daily News India)

Asia-Pacific Leads Global Multichannel TV Sector

The number of multichannel homes in the Asia Pacific now stands at 446 million, reflecting a 57% penetration of all TV homes in the region, CASBAA announced as its Convention kicked off in Hong Kong.

The Asia Pacific remains a global engine room for the

multichannel TV sector, even as the rest of the world worries about overall economic indicators, the Asia pay-TV market seems to be in robust health. In the last 12 months, the number of multichannel homes rose by 39 million. Data indicates that Asia is home to more than half, or 53%, of all global multichannel homes. In the region, TV in general remains the dominant advertising medium as 70% of viewers watch multichannel TV. CASBAA says affluent Asian multichannel TV audiences are early adopters and comfortable with pay-tv advertising. This is backed up by the global adspend figures which are pegged at 61% for television in general.

(ABU News)

UK Broadcast Spectrum Worth £10.8 bn

An independent study on the impact of radio spectrum on the UK economy has found its use to be worth more than £50 billion per year. The report, commissioned by the Government, places TV and radio broadcasting as the highest component of value at an annual £10.8 billion or 21%. Mobile services take 60% of the value.

Broadcasting services support a supply chain worth around £16 billion a year and support 40,000 jobs. The report suggests that network improvements could be introduced within DTT that would increase the attractiveness of the platform to consumers. Specifically the introduction of DVB-T2 transmission technology across the platform, that would increase the number of available HDTV services.

Consumers, it says, are willing to pay significantly more than the current licence fee for their TV services. Most of the value is from DTH subscription services – cable is not included in the calculation – the gain from DTT is low due to the not-for-profit nature of the BBC.

(Broadband TV News)

South Africa Starts DTV

South Africa's commercial launch of DTT will take place in December, although trial signals are now being beamed. For almost the whole of next year the analogue and digital transmissions will co-exist, with plenty of reminders that viewers need to buy a new converter box in order to receive the new programming.

South Africa's government is subsidising the cost of new set-top boxes to the tune of 70 percent to the poorest 5 million in the country. All South Africans will benefit from and be able to afford to move from analogue to digital television in line with world standards. The state signal distributor Sentech had currently achieved digital terrestrial television (DTT) network coverage of 61 per cent of the population, and was on track to reach 80 per cent coverage by March 2013 and 88 per cent coverage by December

2013. The remaining 12 per cent of households is to be covered by satellite technology.

(Advanced Television)

Thailand Postpones Auction of Digital TV Licences

National Broadcasting and Telecommunications Commission (NBTC) has decided to postpone the auction for licences to run commercial terrestrial digital TV channels. The deadline has been put back from March to April next year so that applicants have more time to draw up investment plans. The NBTC will also have time to complete all its key related regulations.

Reports suggest that the NBTC is also postponing, from December to January, the granting of licences for broadcasting service providers for public service and the planned five broadcasting network provider licences. The NBTC will hold a public forum about its decision to divide terrestrial digital TV channels into 48 slots as well as on draft regulations on issuing licences for broadcasting network providers. Of the 48 terrestrial digital television channels planned, four will be high-definition and the rest standard-definition.

(Rapid TV News)

HDTV and 3DTV

More Work Needed on UHD TV

Broadcasters have further work to complete on Ultra High Definition Television before it can enter the broadcast mainstream. At the SMPTE Annual Technical Conference in Hollywood it was stated that interfaces needed for programme production and for connections in domestic equipment both needed attention. The new family of compression technologies, HEVC will be published shortly, but much testing remains to be done.

In August approval was given to ITU-R BT '2020' – the two layers of Ultra-High Definition Television. The lower layer is now called Ultra-HD by the US consumer electronics association, and the upper layer is called Super Hi-Vision by NHK, the Japanese broadcaster.

The broadcasters were urged to experiment with the lower level UHD-1 production now and participate in discussions around the format.

(Broadband TV News)

New Full Sensor Cameras for HD

For the past two years, Sony has floated the tagline "Beyond HD" to hint at the future migration path for its high-resolution camera customers. The cover has now come off, and the plan for cameras that can capture video as data in true 4K, 6K and even 8K resolutions is as sharp as the images they produce.

Since 2010 Sony has been improving upon on a new 35mm CMOS sensor that is capable of 8K resolution image capture, but heretofore has only been enabled for HD, 2K and 4K production. The higher-end models feature

newly developed PL lenses, RAW recorder, a new choice of viewfinders and a new recording media with expanded capacity to accommodate the data-hungry storage needs of high-resolution RAW image files.

The cameras support Sony's new high-speed, enhanced versions of its memory cards based on the memory card technology widely used in XDCAM EX camcorders, the new cards support XAVC 4K and XAVC HD high-frame-rate recording, and can be directly inserted into the cameras.

(Broadcast Engineering)

Ultra HD TV Rolls Out

LG has launched the first Ultra High Definition flat-panel TV – with four times the resolution of today's HDTVs – for consumers in the United States. The LG 210cm class LED TV model quadruples the level of detail from full 1080p HD resolution to a massive 8 million pixels. The only drawback is that its full quality cannot be experienced yet because the so-called "4K" content for television is not yet available, and there is no real timeline for when it will be.

In addition to its picture quality, the Ultra HD TV can also tap their smart TV ecosystem, featuring more than 1,000 apps to date. It also features CINEMA 3D technology and an embedded 2D to 3D conversion engine to expand 3D content availability.

(ABU News)

3DTV Without Glasses

Development of a 2k x 4k 3D without glasses TV dubbed the Ultra-D™ 2160p display has been announced by Stream TV Networks. Until now current 2k x 4k TVs and devices could not reach the full benefit of these advanced panels because there is no native 4k content available for consumer use. Most companies try to compensate by using scalers which only provides incremental resolution improvement.

Ultra-D has developed a ground breaking algorithm which boosts existing content to deliver heightened resolution to between 1080p and 2160p. The Ultra-D 2160p 3D without glasses television allows the viewer greater clarity and resolution that before was not possible.

Ultra-D uses the disparity between images to produce a higher resolution output than the source. This allows for stunning 3D without any viewing angle distortion or other restrictions. Ultra-D 2160p transforms nearly any source content into 2160p 3D without glasses in real-time.

The first Ultra-D products being rolled out are the Ultra-D 42-inch and 46-inch 1080p LED 3D without glasses televisions.

(Digital TV News)

Hybrid, OTT and Internet

Russia - HbbTV Services to Launch in Early 2013

The broadcast network operator RTRS has announced that it will launch HbbTV services on the DTT platform in the first

quarter of 2013. RTRS will provide a single platform for HbbTV service that all broadcasters can use and customize to their needs. Possible service offerings include news information, weather forecasts, video-on-demand services, and advertisement.

According to RTRS, the DTT platform will be available to 72.8% of the population by the end of 2012. Currently between 6-12 DVB-T2 receiver models are available on the Russian market.

(Digital TV News)

Problems Accessing Occasional-use Satellite

The World Teleport Association (WTA) has released a new report that details problems reported by its members in gaining timely access to occasional-use (OU) satellite capacity. OU capacity is regularly sought by news organisations to cover remote breaking stories and by sports networks for live sporting events. As more and more events have begun to be covered live, the availability of satellite time has been reduced significantly.

Based on a survey it found there are increasing delays in completing access procedures, which are putting at risk the operators ability to meet the needs of their customers. The problems, the WTA said, started to arise near the end of 2011. The two biggest causes of delays occur as a result of such standard procedures as setting cross-pol isolation or testing signal power. They include interference on the transponder caused by a third party and an attempt by the end-user to use capacity that had been scheduled – typically for full-time use – by a third party.

The study suggests improvements between teleport operators and satellite operators could come from better expectation setting for occasional use end-users; examining procedures for providing access to capacity leased through third parties; and the continued addressing of satellite interference issues.

(Broadcast Engineering)

Yahoo! and Samsung Form Partnership to Deliver Interactive TV

Yahoo! and Samsung announced an expanded multi-year partnership to integrate Yahoo!'s Broadcast Interactivity platform into Samsung 2012 Smart TVs. Yahoo! Broadcast Interactivity, powered by its automatic content recognition (ACR) technology, will be deployed in Samsung's SyncPlus platform, enabling new opportunities for intelligent content discovery, advertising and engagement, bringing an unprecedented level of interactivity in the living room.

With this agreement, Samsung Smart TV owners will receive real-time, actionable content that runs alongside and complements TV shows and commercials. TV viewers will see subtle, on-screen prompts informing them that additional content can be accessed. In addition, TV programmers can provide complementary content like trivia, additional show insights, commerce or interactive gaming to extend engagement.

The partnership also creates new forms of advertising by extending traditional 30-second commercials into immediate

actions. With broadcast interactivity-enabled commercials, advertisers can embed calls-to-action for downloading apps or digital media, providing coupons, ordering samples, reading reviews or viewing product information.

(Digital TV News)

Satellite, Mobile and Others

ITU Takes Stand on Satellite Jamming

The ITU has issued a statement on satellite jamming. The organisation, "is extremely concerned and alarmed to witness a continuing situation in which satellites operating in accordance with the Radio Regulations and duly recorded in the ITU Master International Frequency Register (MIFR) are the targets of harmful interference."

The statement follows an earlier appeal by the EBU to stop harmful jamming of satellite signals. The ITU said that attention of the Radio Regulations Board (RRB) and of recent World Radio Conferences has been called to such issues, and WRC-12 confirmed that any transmission which has the intent to cause harmful interference to stations of other administrations is, "an infringement of the ITU Constitution, Convention or Radio Regulations, and, that any station operating in the territory of an administration is under the authority of that administration, even if the station is not authorised."

ITU appeals to all its 193 Member States to exercise the utmost goodwill and provide mutual assistance in the application of Article 45 of the ITU Constitution with a view to definitively settling any on-going and future issues of harmful interference.

(Broadband TV News)

DVB Board Approves New Spec for Mobile and Portable Reception

The DVB's Steering Board has approved a new specification – DVB-NGH (Next Generation Handheld). Based on DVB-T2, it includes many improvements and extensions in NGH to aid mobile and portable reception.

Additional features to the specification include MIMO (Multiple-Input and Multiple-Output), Time Frequency Slicing (TFS) with a single tuner, non-uniform constellations, improved and extended LDPC codes for lower code rates, more efficient time interleaving, and ultra-robust layer-1 signalling.

The new specification also covers a hybrid profile where terrestrial and satellite transmission schemes can be combined. It will be submitted immediately to the European Telecommunications Standards Institute (ETSI) for formal standardization and then an NGH BlueBook will be published.

The delivery of the content has to keep pace with the user's demand and behaviour. DVB-NGH is designed to be the ideal solution for broadcast content delivery to handheld and mobile devices for the next decade.

(Broadcast Engineering)

Equipment Trends

Cameras & Accessories

New Cameras Unveiled at IBC

Sony introduced the NEX-FS700' capable of 4K; a camera which appears to offer good value. Also new for IBC was the Sony PMW-200, the successor to the PMW-EX1 camcorder. The new unit is a 4:2:2 50mps camcorder that houses three 1/2-inch Exmor CMOS sensors and is capable of full HD. The SLR as a camcorder offers a reasonable price/performance ratio.



New NEX-FS700EK

Heading up Ikegami's IBC showing were the multi-format HD cameras including the new HDK-97A 16-bit portable HD companion-camera; and the HDK-97C 3G field production camera that supports 1080i/720p and 3G signals. The HDK-97A employs advanced new progressive AIT CCD imagers and an all-new digital video processing system. It also has a full version cousin in the HDK-970A.



HDK97A Production Camera

In the Hitachi range is the SK-HD1200, native 1080/60p studio and EFP camera; SK-HD1000 dockable studio and field camera, SK-HD2000 native 1080/60i studio and field production camera, Z-HD5000 HDTV studio and field camera, DK-H200, DK-H100, and the DK-Z50 multipurpose HDTV camera.

Smaller Super Hi-Vision Camera

The culmination of 17 years of research, NHK has revealed a 'small' Super Hi-Vision (SHV) camera. The camera, which is about the same size as any HD portable camera, is a significant improvement in size over its predecessors. The early SHV cameras came in at 80kg, reducing to 20kg in 2010. This one is a mere 4kg. Inside it uses a single-



Super Hi Vision Camera

plate (33Mp) colour image mechanism with a Bayer filter array, meaning each pixel is filtered to only one of the three red-green-blue intensities, while the missing colours are interpolated to provide the full colour image. Given the size of displays and the number of pixels – hand held shots could be vomit inducing.

(Asia-Pacific TV Technology)

Lighting Console

The Clarity LX300 console range has been unveiled by LSC Lighting Systems. It is a fully integrated console based on the Clarity software originally launched for the PC and Mac in 2009.



LX300 Lighting Console

The Clarity LX console range, comprising the LX300, LX600 and LX900, offers a wealth of new features including a rig view, providing users with quick, logical fixture selection and a detailed 2D simulation of the lighting rig; intelligent fixture cloning and copy/paste using 'real world' data, Colored Fader Ident to instantly recognise fader mode, media server integration with thumbnail representation and pixel mapping built in.

(Entertainment Technology Asia)

Digital Consoles Feature Integrated Lighting Control



New Si Performer

The Si Performer builds upon the successful Si Compact range providing almost twice as much DSP power and increased functionality, with an input capacity of 80 inputs to mix on all models. The built-in I/O provides Si Performer2

with 24 mic and eight line inputs, and the Si Performer3 with 32 mic and eight line inputs, plus the four FX return channels. The provision of two option card slots allows I/O expansion via any of the Soundcraft stageboxes and option cards, giving the possibility of patching up to 80 inputs to mix, or from CobraNet, AVIOM or AES inputs via the appropriate cards.

The unique integration of a DMX512 port offers core lighting control. The first release of software provides four scene masters (A-D) with associated slave channels on the ALT fader layers, individual colour intensities or parameters are set on the slave faders with an overall master level fader, which itself may be assigned to any of the main fader layers for simultaneous access to audio and lighting levels. To automate the process, DMX settings may be stored alongside audio settings in the snapshot system, so both may be recalled automatically by a single button press or via an external MIDI command. With selective isolation, snapshots with just audio or lighting parameter changes may be recalled.

(www.harman.com)

Projection and LED Scalers

Harnessing the power of the Reoftr" video processor running state-of-the-art HQV algorithms from Calibre, HQView530 and LEDView530 are the newest devices. HQView530 is a universal image scaler and scan converter that provides stunning image quality for professional, broadcast and corporate AV users. It features 4-sided soft edge blend with multi-region black level correction for seamless blending of multiple projectors and includes flexible geometry correction functions able to correct image shape and projector misalignment by dragging and dropping each image corner; pin/barrel, rotation or keystone and rotation. It has 3G-SDI input and out connectivity with backwards compatibility with HDSDI and SDSDI. For in-camera use, a Genlock input is provided for compatibility with bi or tri-level sync or black & burst. Full warp mapping is also supported by HQView530. A PC application is included for easy warp map creation and third-party processed from automatic image alignment systems.

LEDView530 is a highly flexible LED video screen image scaler that provides stunning image quality for professional, broadcast, sports, digital signage & corporate AV. LEDView530 features 4-sided edge drag and drop for sizing the picture to fit the LED screen, making system configuration easy. Multiple-unit mode with autozoom allows several LEDView530s to seamlessly drive huge LED walls made of several screens. Support is provided for stacking screens up to 4 wide x 4 high for a maximum screen resolution of 7680x4800.

(www.calibreuk.com)

New LDX Series: Next Step in Image Acquisition

New LDX series of camera systems – initially consisting of the LDX Première, LDX Elite and LDX WorldCam – signify the next step in image acquisition has been introduced by Grass Valley (GV). The series is based on three completely new Xensium-FT CMOS imagers. The LDX series boasts an ergonomic design with time-saving features such as improved

colour management and automated controls which allow operators to concentrate on creativity. In addition, the series offers an ergonomic shoulder-pad – the ComfortPad, which has been developed in close cooperation with physiotherapists and camera operators from around the world. The shoulder pad reduces the tendency to lift the shoulder to level shots, ultimately preventing strain or injury.



New LDX Series

Another key feature is ArtTouch, which significantly enhances the creative possibilities of the camera in live broadcast productions, providing users of the LDX Series with a new level of automated image processing, in order to achieve optimum camera performance. Control integration is improved with: a PickMe button, which enables the cameramen to attract the director's attention; an 'Endless Returns' feature, which enables the user to choose their own return channel via a GV routing switcher; the 'Scene Direct' function, which enables the recall of camera scene files directly from a GV switcher; full remote control over all camera functions via any IP-link using Connect Gateway; and DigiTally, an all-digital remote Tally protocol over IP.

(www.apb-news.com)

HD Coursework with ProHD Cameras

The JVC GY-HM750 ProHD cameras in HD production are paired with Canon lenses housed in JVC KA-790G studio sleds and mounted on Vinten pedestals. Each unit includes a JVC VF-HP790G studio viewfinder, in addition to a 22-inch prompter for the instructor.



ProHD Production Cameras

The GY-HM750 also offers an efficient shoot-to-edit workflow by recording native HD or SD footage in ready-to-edit file formats on SDHC memory cards. It includes a 68-pin chassis connector that creates a direct interface with various modules. Other features include variable frame rate recording, image customization, two XLR audio inputs with phantom power, Pre Rec (retro cache) that stores up to 20 seconds of footage and offers simultaneous recording to both SDHC cards.

(www.tvtechnology.com)

Production Equipment

Centralised Management Server

Medius centralised management server has been upgraded

by Tektronix to provide video service providers a more comprehensive and clearer view of the condition of the programmes flowing through large, geographically distributed networks. Medius is a member of the Tektronix Sentry line of video quality monitoring solutions for cable, telecom, IPTV and other video service providers.



Video Quality Monitoring Solution

Its new programme alert dashboard provides new views of Sentry reports, delivering more programme status and alert status information per screen – allowing users to identify issues more quickly and take corrective action sooner. The new views include a geographical view that displays all of the monitoring points on a map and quickly highlights problem areas or regions; a grid view that shows a programme's alert status across all monitoring points for fast identification and repair of the source locations having video and audio problems; and a tile view that provides a quick snapshot of the alert status of all programmes or services and quickly highlights which programmes need the most attention.

Enter Quad-Channel Multi-Standard ViBE EM4000

A quad-channel multi-standard version of the ViBE EM4000 MPEG broadcast encoder including HD, SD, MPEG-4 AVC and MPEG-2 encoding capability has been launched by Thomson Video Networks.

Developed for satellite, terrestrial, cable, and IPTV applications, the ViBE EM4000 provides “optimised” compression performance, greater flexibility and density. Using the latest generation of compression technologies, the device is said to deliver efficiency improvement of 15% or more when encoding in MPEG-4 AVC, freeing up bandwidth that enables broadcasters to run an extra channel per multiplex or transponder.

The company's Mustang 2.0 encoding engine increases HD MPEG-4 AVC encoding efficiency through improved motion estimation, refined multi-pass encoding and advanced pre-processing.

The device can also deliver further efficiency benefits when configured as part of a statistical multiplexing system using Flexstream 2.0 technology. This frees up bandwidth provisioned for the processing of service components such as audio, teletext, subtitling and closed captioning, allowing bandwidth to be reallocated to improve video quality.

(APB)

Network Management

MSR functionality that has been demonstrated by Net Insight, provides service-centric network management, QoS enhanced links and lossless routing. This functionality enables it to deliver 100% quality of service (QoS) and enhances



SFP Video Access

the service integrity and performance of IP networks. The Company is also showcasing new products and features related to its Nimbra MSR platform which creates service aware media networks that improve the performance of IP infrastructures through the company's service-centric network management, QoS-enhanced links and lossless routing solutions. The company is also launching a flexible solution for QoS transport with integrated video processing and format conversion. Also Time Transfer over IP (TTolP) deploying GPS solely as a means for synchronising single frequency digital terrestrial TV (DTT) networks which carry the risk of jamming or spoofing of signals, was launched. Finally, the company's JPEG2000 video access module supports compression or decompression of up to two 3G-SDI, four HD-SDI or eight SD-SDI channels on a single board.

All-in-One Video Switcher



All-in-one Video Switcher

The Livestream Studio HD500, an all-in-one broadcast-quality video switcher has been introduced by Livestream. The new product features live video switching for multicamera productions, live audio mixing, graphics overlay and titling, digital video recorder (DVR) and player, one-click live streaming in HD multibit rate, up to five HD/SD SDI inputs and five video outputs (HD/SD SDI, HDMI, component, composite and S-video). It is designed to perform as a standalone, broadcast-quality live video switcher when using live video output and is suited for applications such as venue screen broadcasting, live-to-tape production, and network and local television programming, all with or without live streaming to the Web.

(www.broadcastengineering.com)

Audio Equipment

Professional Sound Solutions

A new edition to Lectrosonics line of digital hybrid wireless microphone systems takes the form of the WM Watertight transmitter combining ‘cabled-microphone audio performance with a resistant housing designed to withstand harsh environments, the transmitter is targeted towards location sound professionals and theatrical applications. The fully watertight transmitter employs a specially designed aluminium alloy case with sealed battery doors, an antenna port and a microphone connector. Additionally, a backlit LCD plus large membrane buttons are incorporated into its design to facilitate easy operation even if a user is wearing

gloves. The inclusion of digital hybrid wireless technology ensures a clean audio signal whilst an isolated RF output reduces intermodulation issues between transmitters in close proximity to one another.

The new offering takes on a feature set similar to the manufacturer's SMQV beltpack unit, and can take remote commands from the company's RM remote control unit. Meanwhile, the manufacturer has also released version 5.1 firmware for its Venue Wideband modular receiver system. A key feature of V5.1 is the inclusion of a 'TalkBack' function. When the transmitter is set to TalkBack mode and the function is engaged, the audio will switch to a different, predetermined, XLR on the panel of the receiver. This functionally enables the transmitter to control audio routing which is useful for situations that require real time communication between users. It is possible to have multiple transmitters using a common TalkBack channel XLR, and in order for this functionality to operate on the Venue receiver, at least one empty slot is required in the mainframe.

(PRO AUDIO ASIA)

New Designed Loudspeakers

Leading the trio is the S500 Series of passive loudspeakers, followed by FRS Series power amplifiers and the SP260 2x6 loudspeaker processor have been launched by Mackie. Designed as a high-powered solution for the manufacturer's PPM Series of powered mixers, the S500 Series is intended offer professional, rugged performance at an affordable price point with high output transducers and PVC vinyl covered enclosures. Included in the range is the 12-inch, two-way S512, the 15-inch, two-way 8515 and dual 15-inch, two-way 8525. A companion 18-inch subwoofer, the S518, is also available.



The S525
Loudspeaker



New 18-inch
S518 Loudspeaker

FRS Series amplifiers, meanwhile, are available in two configurations in the shape of the FRS-1700 and FRS-2800, both of which incorporate fast recovery technology. And the 24-bit SP260 2x6 loudspeaker processor is described as offering 'sophisticated EQ, dynamics processing and system protection' for both passive and active enclosures. The unit has a 120dB dynamic range plus 24 user-definable presets and flexible I/O.

(PRO AUDIO ASIA)

S5255 High Quality Transducers

The 55225 is a high power dual 15", 1100 Watts Loudspeaker, powered by transducers from RCF. These high quality transducers, coupled with an innovative new

passive crossover network design is housed in an attractive, highly durable, abuse resistive black paint finish cabinet that delivers incredibly deep bass, smooth midrange and finely-detailed high frequency response. The loudspeaker has an incredible SPL of 134dB & sensitivity of 101db with a wide frequency response of 40Hz-20 KHz. The Studiomaster Professional 55225 is designed to deliver uncompromised audio performance and rugged reliability in the most demanding applications & is the perfect product for DJ's, rental companies, auditoriums, etc, looking out for a high quality system to jazz up their performances.

(Entertainment Technology Asia)

Digital I/O Card for All Frame Multi-Modular I/O System

The C4dio Digital I/O Card is a 4x4 AES3 I/O card with BNC Word Clock Out, In, and In with Termination options. With this card, users have more connectivity options and flexibility in terms of designing signal flow in a Pro64@ audio network. At the centre of the AllFrame Multi-Modular I/O System is the F6 Modular I/O Frame, a multi-purpose network frame with six field-configurable I/O card slots and integrated Cat-5e and fiber optic connectivity. The F6 can be outfitted to meet the audio I/O requirements of nearly any application with C4m Mic/Line Input Cards, C4o Output Cards or the new C4dio Digital I/O Cards.



Digital I/O Cards

Installing six C4dio Digital I/O Cards in an F6 Modular I/O Frame allows the AllFrame to be configured as a 24x24 AES3 digital audio interface. Sample rate converters can be turned on per input pair from within the Pro64 Network Manager software to allow asynchronous devices with digital outputs, but without Word Clock connections, to be used as input sources.

(www.aviom.com)

Miscellany

New Monitoring Solutions

Intelligent Audio Loudness Correction ALC, is the company's end-to-end loudness solution which includes monitoring, logging and correction using real-time processing during the playout workflow. It uses information fed from a broadcaster's traffic system to identify whether content has already been corrected and dynamically avoids the unnecessary processing of content that has already been through loudness correction.

The end-to-end solution utilises segment-aware loudness monitoring and logging, which has been added to company's Kaleido series multiviewers and when used in conjunction with iControl system, can accurately log the average loudness per segment. This enables easy creation of detailed reports at a later date to meet compliance and reporting regulations.

(APB)

NEW

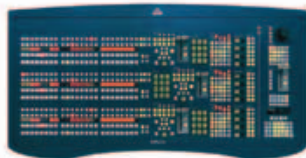
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Live Production that Simply Delivers

Introducing **Kahuna Flare** - the new SD/HD/1080p switcher that brings world-leading Kahuna 360 technology to even the most cost sensitive environments.

Kahuna Flare ranges from 2 M/E to 4 M/E versions, all with an extensive feature set supporting the needs of sport, news, light entertainment, houses of worship and general mid-range broadcast productions.

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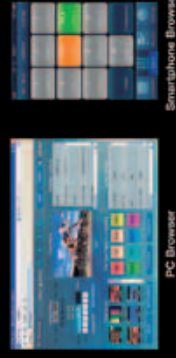
Tapping into a P2 cam

Evolving Your Workflow –
P2 cam Wireless Solution



- Camera recorder status display: Information such as video format, card/battery remaining capacity, time code, rec status, optical filter position, metadata and others can be checked remotely.
- Proxy video¹⁾ playback and storage²⁾: Recorded video clips can be viewed on PCs/Macs, tablet devices, smartphones and portable media players. By connecting a PC/Mac to the AJ-HPX3100, you can save proxy data in the PC/Mac and also transfer files over the Internet.
- Metadata input and editing: Settings before recording, addition of shot marks and text memos during recording, and editing after recording are possible. Text memos can also be entered with one-touch operation.

A wireless network connection helps to use metadata effectively in video production. When installed with the new optional AJ-WM30 Wireless Module and AJ-SFU3100G Upgrade Software Key, the AJ-HPX3100 gains wireless LAN connectivity³⁾. The following three functions can be used with PCs/Macs, smartphones⁴⁾ and portable media players⁵⁾. The AJ-HPX3100 has a built-in web application to allow remote operation from a WWW browser, without using special software.



AJ-HPX3100 Memory Card Camera Recorder "P2 cam"

High-End Performance in a Compact, Lightweight Design.
This 2/3-type P2 HD Camera Recorder Users in a New Level of Mobility to Nature, Dramatic, Documentary and ENG Production.

¹⁾ Connection of up to three units is possible in address mode only. ²⁾ Playback of proxy data is limited to 10 minutes. ³⁾ Connection of up to three units is possible in address mode only. ⁴⁾ Proxy data can be saved only in PCs/Macs. ⁵⁾ To use proxy video, optional AJ-SFU3100G Upgrade Software Key is required. ⁶⁾ Proxy data can be saved only in PCs/Macs. For the latest information, see "Support & Download" on the Panasonic website (<http://pro-av.panasonic.net/>).

<http://pro-av.panasonic.net/>

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