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ABU Technical Committee meets in Bali Hosted by Radio Republik Indonesia

**TECHNICAL
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Contents

2	Digitalisation of Audio Library and Archival Activities: A Case Study at Local Radio Station
7	High Dynamic Range: Standards, Opportunities and Challenges
11	Radio Republik Indonesia: The Newly Born Public Service Broadcaster in Indonesia
16	ABU Technical Committee Meeting Programme
19	ABU Technical Bureau 2014/2016
20	EBU News
22	Pacific Media Partnership Conference 2016
25	New Members
26	4th Regional Workshop on OTT and IBB Technologies, Standards and Services for Media
28	ABU Festival of Technology Webinars 2016
30	IBC 2016, RAI, Amsterdam
32	ABU Technical Advisory Service to Lao National Radio
34	Upcoming Events
38	News from the ABU Region
40	Digital Broadcasting Update
42	Equipment Trends
44	Personalities & Posts ABU Technology Calendar of Events



Cover:
ABU Technical Committee meets in Bali Hosted by Radio Republik Indonesia



Asia-Pacific Broadcasting Union

TECHNICAL REVIEW

From the Editor's Desk



This issue of ABU Technology's *Technical Review* carries two articles on technology. An article contributed by Indian public radio broadcaster AIR addresses, '*Digitalisation of Audio Library and Archival Activities: A Case Study at a Local Radio Station*,' whilst an article on High Dynamic Range (HDR) aims to raise awareness among the ABU Technical Review readers on activities taking place in relation to HDR.

As is customary, the host of this year's TC and associated meetings, RRI presents its profile. This edition also features the programme for 2016 ABU annual meetings.

A report on one of ABU Technology's key activities features the PMPC-2016, Pacific Media Partnership Conference held in Papua New Guinea, hosted by EMTV. Features of the pre-conference two-day workshop jointly organised with ITU, addressing digitalisation issues in Pacific, are also shared in this edition.

A report from another Indian public television broadcaster, DDI, features impressions of a senior staff member's ABU sponsored visit to IBC-2016.

In another article, technical expert, Mr Luu Phu, from radio broadcaster Voice of Vietnam (VOV), describes his technical advisory service mission to Lao National Radio (LNR). He relates his experiences over ten days, during which he repaired two radio transmitters and delivered a short theory and hands-on training course on radio transmitting techniques.



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All India Radio

Digitalisation of Audio Library and Archival Activities: A Case Study at Local Radio Station

abstract

New technologies such as digital and multimedia have taken over the traditional structure and functioning of All India Radio and Doordarshan (Prasar Bharati), the public service broadcaster of India. These technologies have brought revolutionary changes in all spheres of broadcasting, including production, multi-platform delivery systems, acquisition, storage, library and broadcast information management. The new technology introduced digitisation of old records in the library for archival and preservation purpose for the primary use to broadcasters, media historians, cultural and research scholars and general public for easy accessing.

This paper deals with the digitisation activities, for archival purpose, of Nizamabad local radio station's audio library, where important audio recordings related to diversified countryside educational, informational, entertainment data available in LP (Long Play), EP (Extended Play) and audio tapes, since its inception in the year 1990 to till the date of computerisation of production activities in the year 2004.

Key Words: Archiving, Digitisation, Library, Preservation.



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Introduction

Computerisation of All India Radio Studios for programme production was undertaken a decade ago, which brought revolutionary technological changes in audio library in terms of content formats and preservation. Magnetic audio tapes, Long Play (LP), Extended Play (EP) type analogue formats of sound records suddenly became unusable as the Turn Tables(TT), Console Tape Recorders (CTR) etc., were replaced with Hard Disc Based Recording System (HDBR), Compact Disc (CD) player etc. But, the vital data which had been recorded since the inception of All India Radio stations to the till date of computerisation was in the analogue format. The need arose to retrieve the valuable analogue data from the tapes and to convert into digital format for archival purpose to preserve our audio and cultural heritage. The digitalisation in production, post production activities in radio studios have impacted in planning, selection, acquiring, organising, supporting and preserving the digital audio programmes in CD libraries in each station. What was formerly the tape library is renamed as the CD library. Digitisation technology offers to maintain better quality reproduction, reuse of old audio broadcast, to preserve the audio material and also can facilitate to widen the access.

Genesis of Audio Visual Digitisation and Archives

In the year 2013, Expert Committee on Prasar Bharati led by advisor to Prime Minister of India, Mr Sam Petroda

along with its seven-member committee, recommended the creation of a world-class 'National Audio Visual Archives of India' to preserve the rich audiovisual heritage material available both in All India Radio and Doordarshan. So, that the great cultural, educational, historical, political, subject experts interviews and talks, folk, tribal, artistic etc., audio visual content of the past and present could be preserved for public utility as a national asset for present and future generations. The committee also recommended having a dedicated "archives website" that would facilitate free access (open access) for fulfilling the public service broadcaster objectives and also optimum monetisation (closed access) of archival material that could become a significant source of funds for Prasar Bharati.

Accordingly, an Archives Wing was created in Prasar Bharati. The central archives were also set up at New Delhi and regional archives were set up at Mumbai, Kolkata, Chennai, Hyderabad and Guwahati to look after the local language audiovisual archival content. The Hyderabad archival unit was entrusted with digitisation, storage of Telugu related regional language audiovisual broadcast materials available with capital, regional, local radio stations and Doordarshan centres in the states of Telangana and Andhra Pradesh. As part of station wise archival activities, the work of digitisation at All India Radio Nizamabad was started.

Review of Literature on Archiving and Preservation

Analogue recordings are easily affected by click noise, crackle

noise, hiss noise, hum noise and print through noise etc., to the extent of damaging magnetic tapes, LPs, EPs which results in the loss of valuable audio data. Therefore, it is recommended to convert analogue audio data into digital at the earliest possible and store in CD-R (wave format) with audio Meta data to be stored in MS access based data format for easy cataloging/library management. Nirmal Kumar Betchoo (2014), has formulated audio-media for preservation as per the details given below:

Let PAV be the preservation of the audio visual media. The first equation regarding such media would comprise: $P_{AV} = A_{AV}$ (archiving traditional audio visual tape format) + D_{AV} (digitising the audio-visual format) $P_{AV} = A_{AV} + D_{AV}$.

The digitising audio-visual media could be sub-divided into: Converting analogue data (a) to digital data (d) i.e., (a→d), Then $P_{AV} = A_{AV} + D_{AV}$ (a→d)

New technologies could be embedding metadata (E) and conversion to the existing international (J), (Joint Photographic Expert Group) JPEG 2000 format. The formula could be modeled as:

$$P_{AV} = A_{AV} + D_{AV} (a \rightarrow d) + E + J$$

In the long-run when analogue systems have been eliminated through conversion to digital format, the equation could be simplified as: a) $P_{AV} = D_{AV}$ (a→d) + E + J, b) $P_{AV} = D_{AV}$ (E + J).

JPEG 2000 is most common format used for online for storing and transmitting images, documents and photographs, JPEG 2000 uses wavelet based, lossless mode of image compression with provision for allowing embedded metadata.

The archival procedure remains same for audio, as mentioned above. But in the case of archiving audio data, it is very popular to use broadcast wave format (BWF), based on the Microsoft WAVE audio file format, which uses PCM(Pulse Code Modulation) /MPEG (Moving Picture Expert Group) for online, storing and transmitting of audio data. As per instructions from AIR Headquarters, 96 KHz sample rate with 24 bits resolution in linear BWF/WAV file format has been decided for music and archive worthy records.

Regarding the importance of Metadata in archiving, Agarwal (2010) describes that, Metadata is data about data. Metadata records information about objects, including documents or files in digital format. Metadata is important to a digitisation project because it tells you what you have and how to use it. The main categories of metadata are:

- **Descriptive Metadata:** this is used for the indexing, discovery and identification of a digital resource.
- **Administrative Metadata:** this is used for ownership and rights management.
- **Structural Metadata:** this is used to describes relationships between multiples digital files, such as page order in a digitised book or diary
- **Technical Metadata:** this is used for resolution, pixel dimension and hardware, the information is useful for migration.

The different strategies for preserving digital content for future use as described by Day M (2003) are:

- **Medium refreshing:** it is copying digital files from one storage medium to another medium;
- **Data migration:** it is transfer of digital materials from one hardware/software configuration to another;
- **Technology preservation:** it means preserving an information object together with all of the hardware and software needed to interpret it;
- **Software emulation:** it helps in imitation of software to accept same data, execute same programme and achieve the same results as that of imitated system.

All India Radio (FM) Nizamabad and Its Audio Library

All India Radio Nizamabad is located in Telangana state in India and operates on 103.2 MHz. The Local radio stations were established for the purpose of decentralisation and democratisation of broadcast content to fulfill the needs of the local masses, promotion of countryside development, socio-cultural and linguistic diversities of the nation. Local matters such as farm related, folk artists, cultural, gross root countryside social, subject expert and governmental organisations are getting involved in making programmes for broadcasts. Local radio stations promote participation of audiences through interactive radio technology and perform three functions, viz., providing information, education and entertainment to countryside audiences. The tape library has existed since the commissioning of the station in 1990. Since then, the library is collecting different types of analogue audio content on tapes, LPs and EPs in analogue format till 2004, the year from which studio production became digital with the use of HDBR. Machines such as CTR, Ultra Portable Tape Recorders (UPTR) and TT have become obsolete. At the Local radio stations the library is essentially used for creation of new audio broadcast content by a) transferring analogue audio data from old tapes, LPs and EPs as well as b) new digital recordings with HDBRs, preservation and reuse of existing broadcast information resources.

Archival activity started recently with the impetus received from the Expert Committee recommendations as discussed above. The main function of Archives is to transfer the old audio broadcast content on tapes, LPs and EPs (obsolete Technology medium) to the CD-R and external Hard Disk Drive (Latest Technology medium). Digitalisation of Audio is useful for archival purpose and for building nationwide digital assets management of broadcast programmes and local library can be connected to central repository through regional archives at Hyderabad.

At All India Radio Nizamabad, there are nearly 1200 tapes (30 minutes each) and nearly 1500 tapes (15 minutes each) with analogue audio content, which are in the process of digitisation. Similarly, there are nearly 1000 LP discs with analogue Hindi film songs and 800 LP discs of Telugu film songs which are mostly digitised. In addition, there are nearly

2000 EP discs of Telugu film songs in analogue format, which are nearing completion of the digitisation process. At the station, 160 GB film songs are being converted into digital format and stored in external hard disks.

Process of digitisation, Archiving and Preservation:

In today's digital age with a growing number of e- resources, it has become imperative for broadcast professionals and librarians to redefine their role in digitising the broadcast programmes for archiving. The process of transferring audio data from tapes to CD-ROM involves a) Transferring the audio data from tapes to HDBR system b) Editing and filtering of audio data to improve quality and c) writing to CDs and external memory hard disk.

The process of Digitising and Refurbishing is carried out in the following steps:

- 1) The tapes are played on UPTR, which is connected to the HDBR system sound card by selecting sampling rate. Care must be taken while adjusting volume meter such that the level do not cross 100 per cent to avoid over loading of analogue to digital convertor (ADC) to avoid audio clipping.
- 2) To improve the overall quality of the audio data, Noise filtering is carried out with the help of noise reduction techniques. Compensation loss if any occurred in high frequencies is corrected by using frequency equalisation techniques. Removing of layer to layer print effect if any occurred is corrected by inserting silence effect in silence period of tracks. Finally, normalisation of levels is carried out by using suitable volume shapes.
- 3) In this way, the digitisation software captures analogue audio either from UPTR or from the TT at a time by the HDBR system. The HDBR system is capable of supporting speed variations in UPTR or TT, so that digitised audio is no different from the original audio. The real time audio monitoring, analysis and error reporting are possible if any, while digitising the analogue audio. The digitally converted audio can be formatted in BWF, Wave. Later the digitised audio is stored with the incorporated metadata information for accessing in the future.
- 4) Enter the metadata such as artist, album and track names in respective fields before recoding begins and save to the HDBR system hard disk after digitisation and improvement of audio data is finished.
- 5) Insert the CD-R in a CD writer and select the audio which is to be burned onto CD-R. After that remove the CD-R for library catalogues for archiving and preservation. It can be carried to different places, listened to on players and can be sold to customers. Similarly, computer backups can be made by transferring digitised audio on to Hard Disk Drives.

HDBR system used for archives has the following specifications: DELL Precision 1650 Workstation with Intel

@ Xeon @ CPU E3 -1270 V2 Processor, 4 GB RAM, 500 GB 7200 RPM SATA Hard Drive, DVD RW Drive, NVIDIA Quadro 600 Graphics Card, Keyboard, Mouse , Microsoft Windows 7 Professional Edition – 64 Bit OS ,19 inch P1913 S Monitor and Creative Audigy SB 5.1 Sound Card.

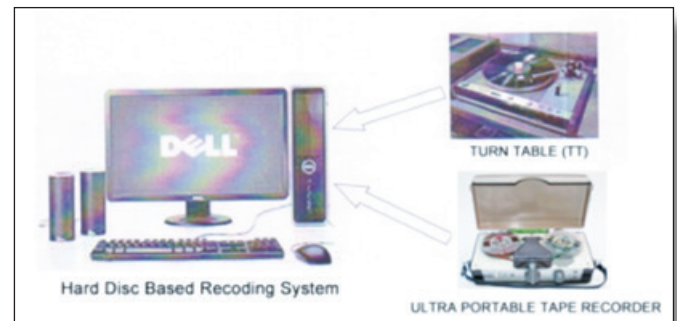


Figure 1: Audio Digitisation / Ingestion Setup

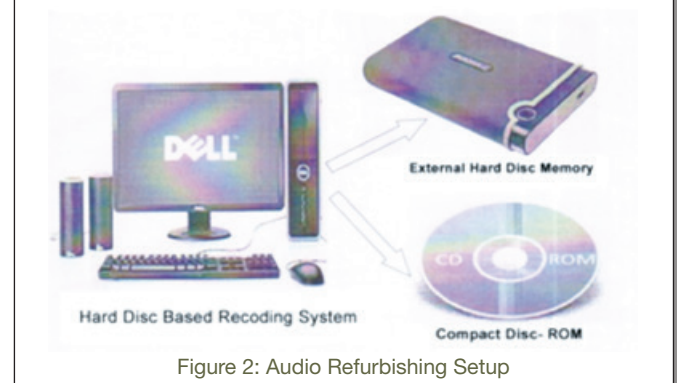


Figure 2: Audio Refurbishing Setup

The studio software such as Audio Science, Wave Lab, Sound Forge, Creative Sound, Cool-Edit, Winamp etc., are provided for automatic ingest of audio signals for recording, editing, file management and replaying etc. The HDBR systems with the help of "Focusrite Scarlett 2i2, the USB recording interface" convert analogue audio input into digital with uncompressed PCM with sampling rate of 96 KHz and 24 bit resolution or MPEG/ BWF/ Wave for processing as shown in fig 1) and for refurbishing as shown in Fig 2).

Preserving the Audio Data

Analogue audio data is damaged due to factors like fungus formation, dust depositing, variations in temperatures and humidity levels, poor physical facilities, mishandling and also repeated over use of tapes, LPs and EPs. Therefore, not only due to obsolescence of technology, but also for wear and tear of tapes, the content of tapes are required to be converted into digital computer files and preserve in CD-R or in Hard disk drive. Still back up of data is required to avoid permanent loss of important audio data in case of theft, fire, other natural and manmade calamities. Therefore, it is advisable not to take risk of losing valuable audio data in which time, money, experts and artists efforts are invested in producing the broadcast programmes. The high capacity hard disk drive is very much suitable in present day technology for back up purpose. It is better strategy to keep at least three backups and they are preferably kept in different locations to safeguard audio data from various reasons.

Conclusion

Archiving involves very difficult decisions. For example an interview with local leader which is not archived may turn out to be valuable because of later fame acquired by the person interviewed. Therefore, it is essential to convert analogue audio data into digital format and store in the CD-R & hard disk drives for future usage. In this way the old audio data produced for broadcast will become computer files at par with the present audio data produced as original digital broadcast data. Once the old and new broadcast data becomes computer files, it becomes easy to store, preserve and accessing for the use of broadcasters, local audiences, cultural historians, research scholars, media persons etc.

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Mr K V Chandrapal Reddy, Library & information Assistant (LIA), obtained his Masters of Science in geography and Masters in Library and Information Science. He joined as LIA at All India Radio Nizamabad in the year 1996. Since, then he has been looking after library matters at the station. He is actively involved in digitisation of analogue audio data available on tapes, Long Plays & Extended Plays. He has created an archival data base at the station for preservation.







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High Dynamic Range: Standards, Opportunities and Challenges



Dr Amal Punchihewa
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abstract

This paper presents progress that high dynamic range studies for broadcasting are making; standards in place, challenges and opportunities that HDR will present to the media market and industry. A question that I have seen in an Asia-Pacific broadcasting magazine motivated me to write this article. As a part of duty as the Head of Technical Department of ABU, this will provide the current status of HDR, its standardisations and what we can expect by the end of year 2016. Just before it was ready to publish, I made some updates based on what I had learnt via media, but not discussed in person with my other CTO colleagues during IBC-2016. In its Technical committee meetings the ABU has discussed HDR and it will be discussed again in October in Bali. By the time you read this article, there could be further new developments and standards that may have been released by standard making bodies such as ITU [1], SMPTE [2] and DVB. One of the key issues is how to commence HDR based services, while most of the standards address HDR combined with UHD. HDR affects the complete value chain of media. Backward compatibility issues are yet to be resolved. With ITU adopting two techniques, primarily for programme production. The Log-Gamma method has been developed to be backward compatible from receiver point of view.

1. What is HDR?

Dynamic range is the ratio between the whitest whites and the blackest blacks in an image. For example, printed images have a dynamic range of less than 100: 1 (because it is difficult to make a black ink that reflects less than 1% of incident light). Dynamic range is often measured in f-stops, which is the logarithm (base 2) of the ratio. Thus, printed images have less than 7 f-stops of dynamic range. SDR consumer TV (8 bit video; e.g., DVD, SD, and HD DVB) only supports about 6 f-stops of dynamic range. Professional SDR video (10 bits) supports about 10 f-stops.

However, the human eye can see up to about 14 f-stops of dynamic range in a single image. Generally, higher dynamic range results in an experience closer to reality and hence, of greater impact or immersion. Furthermore, higher dynamic range also increases the subjective sharpness of images, which provides an additional benefit.

High Dynamic Range Television (HDR-TV) intends to provide viewers with an enhanced visual experience, by providing images that have been produced to look correct on brighter displays, that provide much brighter highlights, and that provide improved detail in dark areas. Therefore the full chain needs to be looked at.

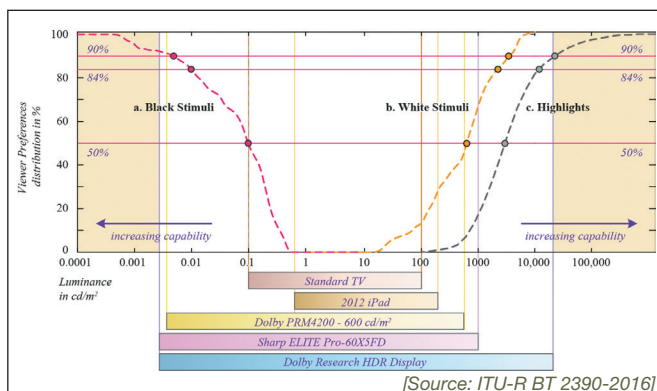


Figure 1: Cumulative distribution functions for a. black stimuli, b. reflective white stimuli and c. emissive and highlights. For comparison, the dynamic ranges of common displays are given]

2. Standardisation

On 5th July 2016, the ITU announced a new standard for High Dynamic Range TV, namely the ITU HDR-TV Recommendation BT.2100 standard [3]. The ITU Secretary-General has described HDR TV as potentially bringing “a whole new viewing experience to audiences around the world,” even as the standard is being built around BT.2020.

“High Dynamic Range Television represents an important step towards the virtual-reality quality of experience to be delivered by future broadcasting and multimedia systems,” said François Rancy, Director of the ITU Radiocommunication Bureau. He congratulated Yukihiro Nishida, Chairman of

ITU-R Study Group 6, for this major achievement [3]. The ABU is humbly proud of him and of NHK.

The ITU-R UHDTV Recommendation BT.2020, approved in October 2015, represented the continuous evolution of television since it was invented in the 1930s, transforming the dim black and white screen into an ultra-high definition colour picture on large flat panel displays.

This latest ITU-R HDR-TV Recommendation BT.2100 brings a further boost to television images, giving viewers an enhanced visual experience with added realism. The HDR-TV Recommendation allows TV programmes to take full advantage of the new and much brighter display technologies. HDR-TV can make outdoor sunlit scenes appear brighter and more natural, adding highlights and sparkle. It enhances dimly lit interior and night scenes, revealing more detail in darker areas, giving TV producers the ability to reveal texture and subtle colours that are usually lost with existing Standard Dynamic Range TV.

The HDR-TV Recommendation details two options for producing High Dynamic Range TV images. The Perceptual Quantization (PQ) specification achieves a very wide range of brightness levels using a transfer function that is finely tuned to match the human visual system and the Hybrid Log-Gamma (HLG) specification which offers a degree of compatibility with legacy displays by more closely matching the previously established television transfer curves. The Recommendation also outlines a simple conversion process between the two HDR-TV options [3].

High Dynamic Range Television (HDR-TV) represents a major advancement in television broadcasting and brings an incredible feeling of realism, building further on the superior colour fidelity of ITU's Ultra-High Definition Television (UHDTV) Recommendation BT.2020. ITU's Radiocommunication Sector (ITU-R) has developed the standard – or Recommendation – in collaboration with experts from the television industry, broadcasting organizations and regulatory institutions in its Study Group 6.

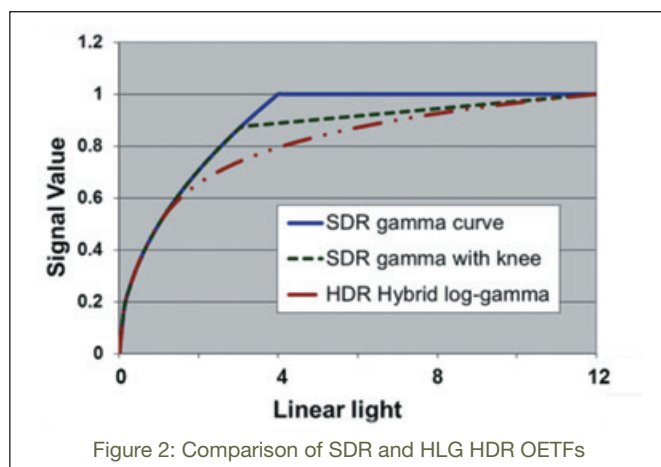


Figure 2: Comparison of SDR and HLG HDR OETFs

The International Telecommunication Union (ITU) and Society of Motion Picture & Television Engineers (SMPTE) are major standardisation bodies in relation to HDR. In 2015, ITU standardised parameters for production in its Recommendation BT.2020. In June 2016, ITU standardised

parameters for production and exchange of UHD content. SMPTE also standardised HDR production interface standards in SMPTE 2082, which defines the electrical and physical characteristics of a 12G-SDI coaxial cable interface suitable for applications where the signal loss does not exceed an amount specified by the receiver manufacturer.

The ITU HDR-TV Recommendation BT.2100 Standard

The ITU-R Recommendation BT.2100 also allows TV producers to choose from three levels of detail or resolution: HDTV (1920 by 1080), and UHDTV '4K' (3840 by 2160) and '8K' (7680 by 4320) – all of which use the progressive imaging system with extended colour gamut and range of frame-rates in ITU's UHDTV Recommendation BT.2020.

"This Recommendation is the culmination of three years of intensive work by dedicated image experts from around the world. HDR images are stunning and this is another major step forward in television quality," said Andy Quested, who was, until mid-2016, the Chairman of ITU-R Working Party 6C (WP 6C), which developed the new standard [3]. "Programme makers today need a much wider range of options in order to meet the expectations of the different platforms they must supply, and this need for flexibility is catered for within the framework of a stable ITU-R Recommendation."

With the inclusion of 1920x1080 pixel array as part of the HDR image format family there are interface definition issues that arise that prevent, complicate or make difficult, simple extensions to current interface standards. This issue has been known for some time. While this is a WP-6B issue there are aspects of payload ID's that need to be considered in WP-6C.

Implementation Challenges

Digital television image formats for HDTV and UHDTV have been specified by the ITU R in Recommendations ITU-R BT.709 [4] and ITU-R BT.2020 [5]. Recommendation ITU-R BT.2100-0 is a recommendation for production and international programme exchange with HDR. Once made, we need to deliver and viewers need to display them. Therefore there are two more aspects to be addressed; viz. delivery and consumption devices.

Rec 2100 expects the HDR-TV image formats should have, where appropriate, a degree of compatibility (this implies less than 100%) with existing workflows and infrastructure.

Capture

Camera manufacturers such as Hitachi Kokusai [6] and Ikegami [7] have taken leadership in High Dynamic Range (HDR) by adding this innovative, cutting-edge imaging capability to their high-quality Ultra High Definition (UHD) 4K. Some manufacturers have even introduced HDTV broadcast cameras with HDR capability. One of them recently offered a special, limited-time promotion, with any new camera purchased before September 30, 2016 including the HDR feature at no additional cost [6].

Delivery

The fact is that the ITU-R has no interface definitions to carry HDR signals yet. The likely candidates to carry an HDR signal could be in Recommendation ITU-R BT 2077- Real-time serial digital interfaces for UHDTV signals and/or yet another revision to BT 1120. According to the Recommendation ITU-R BT 2077, the source ultra-high definition television (UHDTV) image sample structures for the interface are defined in Recommendation ITU-R BT.2020 and are listed in it. UHDTV has an image format (sample structure) of 3 840 x 2 160 (UHDTV1) or 7 680 x 4 320 (UHDTV2). However, there is no explicit mention of the 1920x1080 image sample structure. Text throughout Recommendation ITU-R BT 2077 simply refers to UHDTV. However, HDR will not be restricted to UHD in future. This could be a possible task and a matter for other related working parties such as WP-6B. The task of extending Recommendation BT 2077 to include HDR parameters may require substantial work.

Generally in terrestrial networks, HD signals use 8 bits. Wherever this occurs in the delivery chain a limitation is presented. Most set-top-boxes, receivers and receive equipment can handle 8 bits, especially the decoder is 8 bit.

The DVB organisation is in the process of selecting HDR standard/s for its delivery technology, out of five candidate HDR technologies. Their strategy for HDR will be announced towards the end of the year 2016, which include the HDR standard/s they will incorporate in the DVB distribution and delivery chains.

Receivers

There are television receivers capable of displaying a HDR signal. In the US, cable operators are already offering UHD-1 content with HDR. According to Consumer Technology Association, 4KTV shipments could possibly double the numbers compared to last year.

According to Consumer Technology Association, 4KTV shipments could possibly double the numbers compared to last year.

The implementation challenges are

1. Production (formats, environments (monitoring, quality control, renderer), Workflows and tools, Interfaces to existing systems)
2. Delivery (Codecs and delivery mechanisms, Interfaces) and
3. Consumption (Platform (reproduction, user interaction, environment) & Devices)

Conclusions

HDR has to work with not only with UHD-1 and UHD-2 but also HD media chain. I do agree with Zhao Houlin's statement. HDR will also play key role in success deployment of UHD. The long term success of UHD-1 requires WCG and HFR but HDR is essential. All three elements, HDR and other two elements HFR and WCG are key components for the long-term success of UHD-1.

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author

Dr Amal Punchihewa

Director of Technology & Innovation, ABU

A Vice-Chair of World Broadcasting Union Technical Committee (WBU-TC)

Amal graduated with BSc (Eng) Hons specialised in Electronics and Telecommunication Engineering from Sri Lanka, MEng from Technical University of Eindhoven, the Netherlands & PhD from Massey University in New Zealand. He has published over 100 scholarly articles (peer-refereed technical journal and conference articles) in various journals including IEEE and IET digital libraries and transactions. He has held visiting positions at Tokyo University of Science (Japan) as a visiting associate professor and visiting professor. He was a Royal Dutch fellow of Netherlands and Japan Society for the Promotion of Science (JSPS of Japan). He has served on technical/programme committees, organizing committees and as track/session chairs for many international conferences. He advises on many International conferences including CCBN conference in China, BES in India and BCA in Singapore. Amal is a Senior Member of IEEE, Chartered Professional Engineer-CEng, Fellow of IET (UK) & Fellow of IPENZ (New Zealand).

Amal is currently Director Technology & Innovation at ABU. In that position, Amal drives innovation of media technology in the complete chain of media, starting from acquisition to consumption in the broadcasting industry. He influences the development of media technology in the best interest of ABU members. He leads a team of specialists, he facilitates technical guidelines and standards, and provides expertise related to the convergence of media, and evolving technical needs. He creates, encourages, and manages member communities, and understands and explains the trends that shape the media, to empower Members to continue to take good strategic decisions.

He ensures that the Department continues to be a vital and respected partner for its members and for the media industry. As a member of the ABU Headquarters Management Team, he also plays a major part in shaping ABU strategy.

Amal is active in many of the WBU-TC and ITU broadcast related technical activities. He is a vice chairman of the WBU-TC. He is an advisor to IET Vision and Imaging Professional Network having served as an executive of IET Vision and Imaging Professional Network.

He possess more than 30 years of experience in all three sectors of broadcasting; viz. Academia, Research and Industry in senior broadcasting technology and ICT roles, including research and developments, regional capacity building in media and head of engineering of national TV-Sri Lanka, having started career in computer engineering.

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Member Profile

Radio Republik Indonesia

The Newly Born Public Service Broadcaster in Indonesia

Radio Republik Indonesia (RRI), the newly born public service broadcaster in Indonesia, which was restructured by the broadcasting law no 32, year 2002. RRI is Indonesia's radio broadcaster, covering 88.8 percent of the population of Indonesia. RRI was founded on 11 September 1945, 24 days after the declaration of Indonesian independence on August 17, 1945. Through the microphones of Nippon Hosokyo in Jakarta and a, one-kilowatt, tube transmitter, the declaration of independence reached listeners in Jakarta and abroad. This signified the birth of RRI and it happened just a few hours after Soekarno declared independence. Our founding fathers of RRI namely Abdurrahman Saleh and Yusuf Ronodipuro introduced the RRI motto, "Once on the air, forever on the air".



Since then RRI's policies have been changed three times. Firstly, during the independence war, RRI was used as a tool for influencing people to fight for freedom against colonialism. Secondly, in the era of authoritarian rule from 1965 to 1998, RRI was used as a tool of development. Thirdly, the reformation era during the democratic transition in which RRI has seen presidents changed five times, with Joko Widodo the current leader of the country. He was the elected directly and democratically by the people, showing that Indonesia was becoming a consolidated democracy. RRI played its role during those times, however, with the impact of the reforms, RRI was forced by the people to change and become a true public service broadcaster. Additionally, as the biggest national radio broadcasting network, RRI plays a significant role in providing information services to Indonesian people and foreigners abroad through The Voice of Indonesia- the overseas service of RRI.

RRI has its Headquarters on Jalan Medan Merdeka Barat 4 and 5 Jakarta, located close to the presidential palace. RRI

has a national news network, called Pro 3 which broadcasts on frequencies, AM 999 kHz and FM 88.8 MHz. In some areas broadcasts can be received from Jakarta in FM, digital and analogue via satellite. Especially in the capital, Jakarta, RRI serves listeners thru Pro 1 (regional channel), Pro 2 (youth, music, and entertainment), and Pro 4 (for cultural issues). RRI regional stations operate in 90 small and major cities covering 530 local jurisdictions throughout the country, producing local content and promoting values. At the same time, RRI shares Indonesian values to the world via the voice of Indonesia; bringing Indonesia to the world.



RRI's vision for the next five years is, "Trusted and worldwide". This means that RRI is committed to the latest technologies, such as digital radio broadcasting and using multi-platform solutions. By utilising modern broadcasting technology, RRI can easily deliver information, education and entertainment faster than ever, loud and clear.

RRI Goes Digital

RRI believe that digital radio is both necessary and beneficial to radio listeners in this country. Digital radio is a huge opportunity for radio and for radio listeners. Digital radio is the opportunity to strengthen, to innovate, and to engage. Digital radio is already a good consumer proposition. The FM spectrum is now full and it simply does not have the capacity to deliver the range of services and functions that digital can. The challenge for RRI is to overcome the remaining barriers to allow people to make the choice to move to digital radio.

DAB+ and DRM for Indonesia Digital Platform

Digital Audio Broadcasting (DAB+)

RRI trialed and launched DAB+ digital radio in Jakarta. A decree, issued by Ministry of Communication and Information Technology of the Republic of Indonesia (MCIT) states that Indonesia may use DAB+ as its digital platform on Band III.



Radio Republik Indonesia (RRI) as the public service broadcaster, has been operating a DAB+ trial since August 2013, powered by a 2.5 KW transmitter and antenna located at the top of the RRI headquarters in Jakarta, Indonesia, using channel 12D VHF on Band III. The first stage of the DAB+ trial will cover the Jakarta area and in the future RRI plans to develop coverage and the number of programmes covered by the trial.

RRI and MCIT will add other DAB+ services from two RRI radio stations, one in Entikong, a small city of Kalimantan / Borneo, and the other in Batam City, an island close to border of Singapore. These services are in line with Presidential policy to serve Indonesian citizens in border areas and remote areas. The content will be local, regional and national programmes.

Digital Radio Modiale (DRM)

On the other hand, RRI is looking at DRM for enriching its digitisation platform in Indonesia. The DRM standard is also the perfect solution for Indonesia as radio information is essential to people in our vast and diverse country with its almost 18,000 islands. The key element which persuaded RRI to consider and test DRM was its broadcast flexibility. RRI can use DRM30 to cover large areas of Indonesia that are already receiving our RRI programmes, thus giving unity of information. DRM30 also helps RRI to cater for regional, smaller areas, so useful when focusing on a population with its own local language or dialect and with interests in programmes reflecting their own specificity.

RRI wanted to test everything it had learned about DRM and the fact that early in the 2015 Bogor trial it was able to upgrade a medium wave analogue transmitter to digital for

a trial in a few hours, was amazing. Our Bogor transmitter continued working in analogue of course, with simulcast and also pure digital delivering a lot of extra features. The sound was excellent at quite a distance, right up to the very built up centre of Jakarta.

Following this successful trial RRI signed a co-operation agreement with the Digital Radio Mondiale (DRM) Consortium, during last year's ABU General Assembly in Istanbul 2015.

Looking at aspects of DRM RRI realized that in many instances RRI will not need to buy new transmitters (unless they are very old), that RRI can keep and upgrade the existing analogue transmitters to digital, which means that RRI could go digital pretty quickly and save energy costs too. The standard also allows us to broadcast in simulcast during the transition period, therefore RRI may not need to have two sets of transmitters (one analogue and one digital). DRM's excellent sound at very low bit-rates, especially since the adoption of the latest audio codec, xHE-AAC, makes it very attractive to RRI. But it is not just about sound, nice as it is to get CD-quality in medium wave. It is the fact that instead of one programme on one frequency RRI can have additional two or three programmes, one of which can be data. The data channel will give RRI the opportunity to broadcast texts, pictures, slide shows, traffic information and anything that RRI as broadcasters wish to inform the public about. This is also very useful for RRI in terms of disasters and emergencies. The alert functionality of DRM is extremely beneficial to Indonesia which has experienced a lot of natural disasters. RRI will be able to inform people immediately either nationwide or locally when such calamities strike, allowing RRI to save lives.



RRI would now like to test DRM+ (in the FM band) and this is still on the cards. Both modes of the DRM standard, the one in the AM bands and the one in the VHF bands are of paramount importance for Indonesia, as a large and diverse country. RRI trust that the manufacturing industry here in Indonesia will be able to produce a variety of cheap digital receivers, thus saving the high cost of imports.

RRI is committed to modern, digital radio hope to bring our much appreciated content, information, education and entertainment through digital radio to all Indonesian citizens.

The challenge of radio's transition from analogue to digital is the relationship between the radio and listeners and is a personal and emotional one. That is why RRI strives to

make it clear that the needs and concerns of radio listeners will be absolutely central to our approach to Digital Radio Switchover. It is essential that RRI maintain the momentum towards digital, and that RRI start to really pick up the pace and make some real progress.

New Media RRI RRIPLAY, BEYOUNG & RRI30"

Beautiful strains of Tifa musical instrument, gong (mambokon) and drums (bakulu) is oftenly heard on Pro 1 RRI Sorong, accompanying dance Wor, Main Moun, Batpo dance, dance and art Yako Flute typical drums Papua, very loud and clear.

Then click to switch to the Sundanese language conversation and kecapu sulung in Programa 1 RRI Bandung.

Now in a few minutes you can explore many cities in Indonesia through RRIPLAY with just the touch of a finger.

RRIPlay proudly present the largest broadcasting network and introducing Amazing Indonesia for those of you who want to venture out and explore Indonesia
Listen to 171 channel Audio Streaming in RRI PLAY and find out about Indonesia in your smartphone by download RRIPLAY in PlayStore and App Store



RRIPlay:

- News (text, Pict and Audio) from 93 RRI network
- Audio Streaming with iconic image:
 - Programa 1: 75 channel
 - Programa 2: 64 channels
 - Programa 3: 1 channel
 - Programa 4: 26 channel
 - 5 Special Channel: Classic, Jazz, Indonesia, Keroncong, Melayu Dangdut
- Podcast
- Free download PlayStore and Appstore

Mery Celeste still on top of indie music chart in June 2016, followed by Jazzel and D'Belzer on the next chart, vote them to get in to top chart.

Enjoy also Pro 2 celebrity interview with Raisa, Afgan, Agnes Monica and other top Indonesian artist.

We present more attractive contents to young people and enjoy our podcast that you would love//



Now more than 200 indie musicians (band, duo, solo, trio) joined in Beyoung Apps.

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Beyoung:

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Watch around you, Take pictures, input text and record your voice reportage for a maximum of 30 seconds and send to us in a second.

We publish information and news from you through RRI30 "(read: RRI30detik) and Be a Citizen journalis and be a RRI reporter.

download RRI30" in PlayStore and share your information/ news.



RRI30'':

- Upload Text, Picture, Audio for Citizen Journalism
- News and Information from citizen / public
- CMS for RRI Journalis
- Mudik Map
- Free download PlayStore

Radio Republik Indonesia is trying to appear aggressive following Go Digital Era, Media Convergence. The challenge for us is how to provide convenience, comfort and technology openness to the public and media actors for diversity and segmentation of content in RRI broadcasting.

Generation 3.0 is to be a reference in innovating technology to adjust to the concept of Over The Top and Integrated Broadcast Broadband to keep in tune with the global technology wave.

The choice for the public in accessing content through technology owned by RRI will be more diverse. RRI is now developing automated synchronization for broadcast automation system and mobile apps, so the public can monitor the programme playlists and play songs freely.

Slowly but surely, RRI will provide a new window to the public via DAB + technology so that the content becomes more qualified, in-line with the program and rich content



RRI hosting ABU General Assembly and Associated Meetings 2016

Indonesia is a huge archipelagic country extending more than 5,000 kilometers from east to west and almost 1800 kilometers from north to south lying below the equator and consisting of hundreds of distinct native ethnic and linguistic groups. Indonesia's national motto, "Bhinneka Tunggal Ika – Unity in Diversity" articulates the diversity that shapes the country. Despite its large population and densely populated regions, Indonesia has many beautiful tourist resorts and vast areas of wilderness.

RRI and TVRI the Indonesian Public Broadcasters play significance roles to maintain and enhance the diversity of Indonesia. Broadcasting from 81 stations all over region, RRI serve the people nurturing the principle of independence and impartiality. Established 71 years ago, RRI is now serving the nation with information, education and cultural program, and also entertaining people lives not only in the city but those in rural, remote areas and in the border region.

Entering digital age RRI has started in utilising multiplatform services without abandoning analogue and terrestrial transmissions. The RRIPlay application has been created to meet the demand of new technology serving all Indonesian people.

In Bali there will be a very valuable discussions and sharing of ideas to enhance the role of radio and television entering digital age. The ABU General Conference 2016 will be a milestone to further meet the challenging future of broadcasting.

RRI as the host of ABU GA 2016, warmly welcome all distinguished participants.



Progress, collaboration and growth

WORLD
DAB
Digital Audio Broadcasting

DAB+ digital radio is progressing around the world.

- 46 million DAB/DAB+ receiver devices sold worldwide
- The Asia Pacific, Arab States and South Africa have started DAB+ trials and policy development
- The LG Stylus DAB+, the world's first smartphone with built-in broadcast DAB+ digital radio, launched in May 2016
- In Australia 33 auto brands offer DAB+ and car adapters are available from \$64
- Public broadcaster Radio Republik Indonesia (RRI) has launched DAB+ digital radio in Jakarta, Batam and Entikong
- In Europe:
 - Norway leads with Digital Switchover in 2017
 - Switzerland planning Digital Switchover in 2020-24
 - France plan 97% DAB+ coverage by 2024



433 million
people covered by DAB/DAB+

1,970
Full-time DAB/
DAB+ services
on air



DAB/DAB+ coverage near
FM footprint reaching
99%
of the population in some markets



Australia: DAB+
launched July 2009



China: DAB in
Beijing & Shanghai



Hong Kong: DAB+
launched 2011



Malaysia:
DAB+ trials on
air and policy in
development



Indonesia: DAB+
launched April 2016



NZ: DAB+ trial on
air in Auckland
and Wellington



S Korea: interest in
DAB+, DAB on air



Thailand: DAB+
trial in 2017



Vietnam: DAB+
trial 2013

In Australia, 3.52 million people listen to DAB+ in the five metropolitan cities. DAB+ launched in Hong Kong in 2011, Indonesia 2016 and several markets including Thailand, Malaysia and Vietnam are now planning for DAB+.

From trial to switchover, WorldDAB can support the transition from analogue to digital radio. Contact us for assistance with:

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% New cars with DAB/DAB+



Norway

63%



UK

85%



Switzerland

65%



Germany

13%



Denmark

5%



Netherlands

16%



Italy

24%



France

15%



Australia

31%

1 All figures standard fit except Germany and Italy which also includes cars with DAB+ taken as an option.

Sources: JATO Dynamics 2015 (Norway, Denmark, Netherlands, France), SMMT/CAP automotive Q2 2016 (UK), MCDT (Switzerland), DAT/VDA (Germany, data from interviews with new car buyers Apr - Jun 2015) (Germany), digitalradio.it estimate (Italy), Glass's Automotive Business Intelligence March 2016, Commercial Radio Australia (Australia)

To find out more about WorldDAB and events in the Asia Pacific region visit www.worldadab.org



ABU Technical Committee Meeting

21-22 October 2016 • Bali, Indonesia

PROGRAMME

Westin Resort Nusa Dua, Nusantara 1

Day 1 – Friday, 21 October

09:00 – 10:30

1. Opening Session

Welcome address
Chairman, Technical
Committee

Mr Masakazu Iwaki
Head of Human Interface Research Division
Science and Technology Research Laboratories, NHK-Japan

Welcome address

Mr Frederik Ndolu
Member of Supervisory Board, Radio Republik Indonesia

Opening Address

Dr Javad Mottaghi
Secretary-General, ABU

Announcement and Presentation of the 2016 ABU Technical Review Prizes and Engineering Awards

Announcements

Dr Amal Punchihewa
Director Technology & Innovation, ABU

Engineering Awards

Presented by

Technical Review Prizes
Commended Articles

Mr Hamid Dehghan Nayeri
Director, International Technical Affairs, IRIB-Iran
and ABU Technical Committee Vice-Chairman

Best Article

Mr Rahadian Gingging
Director of Technology and New Media
Radio Republik Indonesia

Green Broadcast

Mr Doo-Hyung KANG
ABU Technical Liaison Officer
Korean Broadcasting System on behalf of KOBA

Industry Excellence

Dr Javad Mottaghi
ABU Secretary-General

**Developing
Broadcasters'**

Mr Frederik Ndolu
Member of Supervisory Board, Radio Republik Indonesia

Broadcast Excellence

Mr Masakazu Iwaki
Head of Human Interface Research Division
Science and Technology Research Laboratories
NHK-Japan, Chairman ABU Technical Committee

**ABU Distinguished
Service Award 2016**

Dr Javad Mottaghi
ABU Secretary-General

Session Chair:

Mr Masakazu Iwaki
NHK-Japan, Chairman, ABU Technical Committee

2. Confirm Agenda and TC-2015 Proceedings and appointment of Rapporteurs

3. Director's Report – Dr Amal Punchihewa, Director Technology & Innovation, ABU

10:30 – 11:00 Tea, coffee & networking

11:00 – 12:30

4. Bureau Proposals

4.1 Cyber security

– *Dr Amal Punchihewa, Director Technology & Innovation, ABU*

4.2 Character set for subtitling and closed captions

– *Mr Masakazu Iwaki, NHK-Japan, Chairman, ABU Technical Committee*

5. WRC-19 & WRC-23 Preparations

Prioritise 3 items from ABU spectrum strategy combining Topic study

6. Technological Inspirations:

6.1 UHDTV-1 ATSC 3.0

– *Mr Young-Seok, Chae, Senior Engineer, KBS TRI (Technical Research Institute), Korea*

6.2 Future of Broadcasting and Television Delivery

– *Dr Peter Siebert, DVB-Switzerland*

6.3 Media Convergence Technology and Practice

– *Mr Kong Bin, RTPRC-China*

12:30 – 14:00 Networking lunch

14:00 – 15.30

Session Chair:

Mr Tharaka Mohotty

MTV-Sri Lanka and Vice-Chairman

ABU Technical Committee

7. Strategic Issues:

7.1 HDR, WCG, UHDTV and HFR

– *Mr Narichika Hamaguchi, NHK-Japan & Mr Naoki Kashimura, Ikegami-Japan*

7.2 Spectrum for Future Broadcasting

7.3 IBB-Integrated Broadcast Broadband

– *Dr Ahmad Zaki Mohd Salleh, Media Prima Berhad*

7.4 Digital Radio - WorldDAB & DRM

7.5 ABU Digital Strategy

– *Mr Hamid D Nayeri, IRIB-Iran and Vice-Chairman, ABU Technical Committee*

7.6 Devices for Evolving Media –

FM Radio in a Chip – *Mr Bob Plummer, Chair of WBU-TC & NABA-TC*

DAB+ in a Smartphone – *WorldDAB*

7.7 Human Capacity Building

– *Ms Chrissie Tucker, ABC-Australia*

15:30 – 16.00 Tea, coffee & networking

16:00 – 17:00

Session Chair:

Mr Hamid D Nayeri

IRIB-Iran and Vice-Chairman, ABU Technical Committee

8. Members' Present:

8.1 Closed Captioning NGB *Dr Peter Siebert, DVB-Switzerland*

8.2 *Dr Fares Lubbadah, SpaceTech-Jordan*

8.3 Transmission System of KBS, *Mr Min-Jun, Yoon, Engineer, KBS*

8.4 TBC – *Eutelsat Asia*

17:00 – 17:30

9. Networking with Technical Liaison Officers (30 min)

Day 2 – Saturday, 22 October

09:00 – 09:30

10. Keynote Presentation:

UHDTV-2 and 2020 Olympics Media Chain

Mr Tomohiro Saito, Executive Research Engineer, NHK Science & Technology Research Laboratories

09:30 – 10:30

11. Technology Debate***Embracing IP for Media Production*****Moderator:****Dr Amal Punchihewa**

Director Technology & Innovation, ABU

Debate Team

Mr Masakazu Iwaki, NHK-STRL, Japan, Chairman, ABU Technical Committee

Dr Peter Siebert, Executive Director, DVB-Switzerland

Dr Fintan Mc Kiernan, CEO, Ideal Systems

Mr Bob Plummer, Chair, WBU-TC and NABA-TC

Mr Naoki Kashimura, Director of the Board, IKEGAMI

Dr Narichika Hamaguchi, NHK-Technology Management, Japan

10:30 – 11:00

Tea, coffee & networking

11:00 – 11:40

12. Summary from Topic Area ChairmenTransmission *Dr Narichika Hamaguchi, NHK-Japan*Capacity Building *Mr Tharaka Mohotty, MTV-Sri Lanka*

Spectrum

11:40 – 12:30

13. Elections of Technical Committee Office Bearers

12:30 – 14:00

Networking lunch

14:00 – 15:00

14. The Host Presents**Radio Republik Indonesia****Moderator:****Mr Rahadian Gingging**

Director of Technology and New Media

Radio Republik Indonesia

DAB+**EWS Studies****DRM****DTT on DVB**

15:00 – 15:30

15. New Recommendations & Decisions of the Technical Committee

Session Chair: Mr Masakazu Iwaki, NHK-Japan, Chairman, ABU Technical Committee

15:30 – 16:00

Tea, coffee & networking

16:00 – 17:30

16. Useful to know:**New members**

Updates from Sister Unions & Intl Organisations

*(Dr Peter Siebert, DVB, Mr Bob Plummer, WBU-TC & NABA,**Mr Bassil Zoubi, ASBU, WorldDAB, DRM, AIBD)*

Updates from Status reports

17. Any other matters

Mr Masakazu Iwaki, TC Chairman

Announcements of Upcoming ABU Events:

ABU Digital Broadcasting Symposium 2017*Mr Ahmed Nadeem, Head of Studio & Training, ABU***ABU Media Summit on Climate Change and DRR 2017***Ms Natalia Ilieva, Executive Assistant to the Secretary –General, ABU***Pacific Media Partnership 2017***Dr Amal Punchihewa, Director Technology & Innovation, ABU***18. Summary & Closing**

Mr Masakazu Iwaki, TC Chairman and Dr Amal Punchihewa,

Director Technology & Innovation, ABU

ABU TECHNICAL BUREAU 2014/2016



Chairman
Masakazu Iwaki
NHK-Japan



Vice-Chairman
Hamid D Nayeri
IRIB-Iran



Vice-Chairman
Tharaka Mohotty
MTV-Sri Lanka
Chairman Training & Services Topic Area



Vice-Chairman
Lasantha Samaranayake
EAP-Sri Lanka



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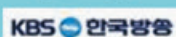
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KBS-Korea



HJ Ab Wahid bin
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RTM-Malaysia



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TPT-Thailand



Solomone Finau
TBC-Tonga



Yusuf Yildirim
TRT-Turkey



Dr Narichika Hamaguchi
NHK-Japan
Chairman Transmission Topic Area Bureau, Ex-Officio



Zhu Yun Yi
RTPRC-China
Chairman Spectrum Topic Area Bureau Ex-Officio



Hanife Sayilir
TRT-Turkey
Chairman Production Topic Area Bureau Ex-Officio



Eng Saleh
Al-Meghaileth
Saudi Broadcasting
Corporation
Invited Member

THE LATEST NEWS FROM EBU TECHNOLOGY & INNOVATION

Shannon Frame

Technical Editions Manager (EBU)

It's been a busy few months here at EBU. As usual, we took part in this year's IBC Conference with a number of technology demonstrations, including: high frame rates with high dynamic range, a personalized news channel, sports semantics, virtual reality and more.

On 10 September 2016, we hosted an EBU Session at IBC focusing on cybersecurity. Media consumption patterns have tremendously changed over the past few years and as a result, more audio and video content is being delivered over the internet. As traditional production applications move to the cloud, it is becoming more important than ever before for broadcasters to increase their cybersecurity and raise awareness of this important topic.

Speaking of IP production, the VRT-EBU LiveIP Studio was used on the IBC TV Channel this year and an IP Interoperability Zone was created to showcase the latest developments. To top it off, the well-regarded VRT-EBU LiveIP Studio was awarded the IBC Innovation Award for Content Creation.

To find out more, visit our website at

tech.ebu.ch

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EBU DevCon

01 – 02 November, EBU

This year will mark the fourth anniversary of our annual EBU Developer Conference. A unique opportunity to learn more about best practices in software engineering and get hands-on current development and deployment tools. Participants will brainstorm new ideas for running software-driven broadcast infrastructures and improving engineering workflows. The event is also a great place to meet experts who are addressing similar challenges on a daily basis.

<https://tech.ebu.ch/events/2016/devcon>

EBU Forecast

23 – 24 November, EBU, Geneva

Linear television or Digital Terrestrial Television (DTT) services remain at the core of most public broadcasters' services. However, audience consumption patterns are changing and new distribution opportunities – like Over the Top (OTT) services or the development of future mobile options like 5G – are becoming and will continue to become more popular in the future. So, how will DTT evolve? And, how can broadcasters make the most of future options for reaching audiences? This year's EBU Forecast will focus on these questions and more!

<https://tech.ebu.ch/events/2016/ebu-forecast-2016>

EBU Production Technology Seminar

24 – 26 January, EBU, Geneva

The annual EBU Production Technology Seminar is the place to be to keep abreast of technology developments for broadcasting and a unique opportunity to get hands-on with the latest tools and gadgets.

<https://tech.ebu.ch/events/2016/pts>

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cloud services**

Pacific Media Partnership Conference: PMPC2016, Port Moresby, Papua New Guinea

- A Report by Dr Amal Punchihewa, Director Technology & Innovation

The PMPC-2016 conference in PNG focused on how broadcasters could protect public free-to-air broadcasting. Some of the key requirements were identified through discussions and deliberations. Those requirements need to ensure the desired availability and technical quality of public service media services across various distribution platforms and on ubiquitous devices. Two workshops and a conference on the third day covered both technical and non-technical (regulatory, market, business, etc.) strategies to protect Public Service Media (PSM) delivery as free-to-air broadcasting.



The ABU has 25 members, spread over 10 countries in the Pacific region and one hundred and twenty six (126) delegates from 19 countries participated in the event. PNG media personnel benefited immensely from the event by having it held in their neighbourhood. The main conference, having the theme '*Collaborating for Broadcasting*', was inaugurated by Ministry officials of PNG on 26th August.

Pre-conference workshops commenced on 24th August in Port Moresby leading to the PMPC-2016 conference. This year's Pacific Media Partnership Conference was hosted by ABU member, EMTV from 24th to 26th August. The three day event was being held in Papua New Guinea for the first time, with the sponsorship of EMTV, ITU and the Australian Government.



Pacific Islands Forum Fisheries Agency, NBC, NICTA, SPREP, FM100, PACMAS, Radio Frequency Systems, Rohde & Schwarz, UNESCO and NHK were supporters of the conference. The workshop, '*Capacity building for Digital Broadcasting*' discussed challenges and issues faced by

broadcast media, especially various factors that affect the digitalisation process. A wide range topics was addressed by twenty speakers in ten sessions.



Workshop on Digital Migration and Capacity building for Media

The session was opened with welcome addresses from EMTV by Mr. Eng. Bhanu Sud, CEO, EMTV and Dr. AMAL Punchihewa, Director of Technology & Innovation, ABU. Dr Punchihewa thanked Mr Bhanu and his team for excellent arrangements made to host the 2016 PMPC event in PNG. He also thanked the supporting organisations and ITU and the Australian Government, the other sponsors.



A session titled "The current situation in the region", which analysed information about the status of the transition in the region was presented by ITU Expert, Mr Andrew King. He stressed the need for each administration to examine the data in the ITU Frequency Register and the Digital Switch over (DSO) Database.



Mr Andrew King

Mr King also presented, “Australian DTTB Implementation Experience Update”. The participants were keen to know how the spectrum was re-assigned as part of the digital dividend. There was also interest Australia’s experience of interference from mobile networks operating in frequencies allocated within the ‘digital dividend’ and in the steps taken to mitigate the issues.

Two sessions addressed issues related to digital migration and the development of digital broadcasting in the Pacific. Five presentations were made by Pacific members. These sessions were moderated by Dr. Amal Punchihewa with Mr Andrew King, who made his presentation as a background to the topic. Another five presenters introduced and discussed progress in their respective countries.

Tonga

Mr Andrew Toimoana Ministry of Information and Communication (MIC) provided the view from Tonga. He advised that they had now passed an update to their Communications Act, according to one of the recommendations in the ITU report and some progress had been made on other recommendations. Progress was slow and there was still caution from TBC and DBN regarding Digicel. If the World Bank could fund the fibre between the island groups, this would assist switchover. Funding for the free-to-air (FTA) broadcasting remained the major challenge.



Mr Andrew Toimoana

Samoa



Mr Eteuati

Mr Eteuati of the Office of the Telecommunication Regulator (OOTR) provided his update about Samoa. Progress had been made on technical standards and they were currently considering how to issue a multiplex licence and what form that would take. From there, it depended on who was awarded the licence as to whether funding would be an issue. There had been a recent staff change at OOTR which had probably slowed their progress a little, but they were progressing.

PNG

Mr Kila Aluvula of National Information and Communication Technology Authority (NICTA) provided an update on the PNG situation. Many of the recommendations in ITU experts’ reports as updates to the digital road map had been considered and most implemented. The 8MHz plan had been rejected after consultation with Digicel, pay television operator from Telcos. Conversion had moved forward in the form of a Request For Proposals (RFP) issued by EMTV and was awaiting award by EMTV’s owner Telikom PNG who



Mr Kila Aluvula

had apparently been instructed by the PNG government to make an award and to get the project moving, raising hope that the project will progress soon.

Micronesia

An update from the State of Yap in Micronesia was presented by Sebastian G. F. Tamagken, Chief of Media & Protocol Division, Department of Youth & Civic Affairs, Yap State Government. Their presentation indicated that they were on air in AM, FM and digital TV.



Mr Sebastian G F Tamagken

Kiribati



Mr Teannaki Tongana

Mr Teannaki Tongana, CEO, Broadcasting & Publications Authority (BPA), presented an update from Kiribati. BPA were seeking to have a non-operating TV station transferred to them so they could start transmissions again. Previously this station had operated as a pay TV service but, having little content, it closed in 2012. They might seek assistance in the future if the transfer occurs and they needed funding for TV transmitter and production equipment. BPA were currently working on Line Island AM expansion.

During the main conference, Mr King presented “DSO Challenges” in a session that shared the outcomes from the workshop by summarising the findings from the discussions on DSO Challenges. The following are some of the key points of the summary.

In the summary for the Digital Migration and Capacity building for Media workshop, the main challenge for switchover was funding. There were ample discussions among broadcasters, administrations and industry about what do they needed to do to progress switchover and none indicated that they needed any assistance, other than funds. PNG in a pathway to digital, including an implementation plan presumed that they would be able to fund digital transition by themselves.

Having successfully concluded the two pre-conference workshops of PMPC-2106, Mr William Duma, Hon. Minister



for State Enterprises and Mr Douglas Tomuriesa, Hon. Minister for Forestry graced the occasion of the formal opening of PMPC-2016. Minister Duma mentioned that the PNG government was very committed and looking forward to long term goals of digitalisation. Representing the Prime Minister of PNG, Minister Tomuriesa said that PNG was undergoing a transformation within a single generation, from a traditional commodity economy to a modern economy.

The ABU Secretary General emphasised the ABU's commitment to its members and the requirement to think globally and act locally. The CEO of EMTV Mr Bhanu Sud gave a brief outlook of EMTV, its commitments and plans for digital delivery of media in PNG.

Picture-8



Dr Javad Mottaghi



Following the lunch break there was a wide-ranging panel session, moderated by the Secretary General of the ABU, Dr. Javad Mottaghi. A Panel comprising a wide range of experts discussed a number of issues and challenges those Pacific members and other media confronted today. Panellists include Mr Masakazu Iwaki of NHK Japan, Mr Andrew King representing ITU, who was the expert for a number of revisions to road maps of digitalisation in Pacific region, Mr Scott Waide, Bureau Chief of EMTV, Mr Robert Luke Iroga, Board Deputy Chairman of Solomon Islands Broadcasting Corporation, Mr Kila of the National Information and Communications Technology Authority-NICTA and Mr Mosses, President of Pacific Islanders News Association-PINA (not in the above picture).

The panel discussed inclusive broadcasting, i.e. Broadcasting to every one in our society with provisions to cater to the visually and audibly handicapped, the role of broadcasting in carrying news promptly and accurately, the role of broadcasters in the preservation of national heritage and communication in relation to disasters, universal access with no gatekeepers and the power of radio as communication at all times for every person.

More than 25 speakers shared their experiences with the delegates of PMPC-2016. Some of the speakers who contributed to workshops and the main conference are pictured here.

Col. Dr. Natee Sukonrat, Vice Chair of the National Broadcasting and Telecommunications Commission and Chair of the National Broadcasting Commission, Thailand presented two topics covering Regulatory Implications of WRC-15 and preparations for WRC-19 & WRC-23 and the current status of Digitalisation in Thailand. Mr Nils Ahrens, Rohde & Schwarz, Australia presented many



Col. Dr. Natee Sukonrat



Mr Nils Ahrens



Ms Nanette Woonton



Mr Prasanna Meemeduma



Mr Mosses



Ms Aterina Samasoni



Ms Lisa Williams

topics, including evolving new technologies such as HDR, workflows and efficient transmission technologies. Mr Masakazu Iwaki, Head of Human Interface Research Division, Science and Technology Research Laboratories, NHK (Japan Broadcasting Corporation) presented accessibility by the disadvantaged, through technologies and services. The Head of Communications and Outreach unit of the Secretariat of the Pacific Regional Environment Programme (SPREP) – Samoa Ms Nanette Woonton spoke on the role of media in social issues such as Environment, Climate Change. Mr Prasanna Meemeduma of Radio Frequency Systems Australia presented on Trends & Insights in Communications Services. Mr Mosses, President of Pacific Islands News Agency (PINA) highlighted the value of radio and media in general in the social development of countries. Ms Aterina Samasoni of UNESCO office in Samoa spoke on the archiving of audio video materials. Ms Lisa Williams-Lahari of the Pacific Islands Forum of Fisheries Agency (FFA) facilitated two workshops and trained over 30 participants on use of mobile devices/smartphone for media reporting with a number of other trainers.

PMPC-2017: Solomon Island Broadcasting Corporation will host the next PMPC in Honiara



Having successfully concluded three day Pacific Media Partnership Conference with two pre-conference workshops, next PMPC-2017 was announced. ABU full member in the Pacific, Solomon Island Broadcasting Corporation (SIBC), will host the event in Honiara from 15th to 17th August 2017. SIBC has been a full member since 2009 has been active in all six PMPC conferences held in the Pacific region since 2010. Dr AMAL Punchihewa who led and steered the PMPC-2016 thanked all delegates for their participation and for sharing knowledge with rest of the delegates. On behalf of ABU secretary general Dr Mottaghi and the ABU family, he also thanked the Host EMTV, Mr Bhanu Sud, CEO of EMTV and his team.

Mr Robert Luke Iroga, Board Deputy Chairman of Solomon Islands Broadcasting Corporation invites all delegates to the next event in Solomon



Mr Robert Luke Iroga

Islands. The ABU and SIBC extend a warm invitation to all stakeholders in Broadcast Media, especially delegates from the 25 members spread over 10 countries in the Pacific region. Over the last few years the event has proved the value of sharing best practices and discussing issues common among media players. More information will be made available on the PMPC website leading up to the event and suggestions and contributions to the event will be welcomed.

The host and the ABU believe that a number of Islanders are making their way forward in digitalisation. Currently the conference has been given the theme "Television: Islanders on Screen!". On behalf of Secretary General of the ABU and its members Dr AMAL Punchihewa, Director of Technology & Innovation wishes all success in their media operations and says, 'See you all in Honiara in 2017'.



New Members

Additional Full Member

Asian TV

Asian TV joined the ABU in September 2016 as an Additional Full Member. This satellite television channel, based in Bangladesh, started broadcasting on 18 January 2013. It is an entertainment and news based television channel with the motive of taking Bangladesh's electronic media industry to a new dimension.

Asian TV is a Bangla language, automated TV channel with hi-tech cameras and the most sophisticated equipment to provide the best possible viewing pleasure to its audience. Asian TV's best programmes focus on music, social issues and politics. It is presently broadcasting in Asia, Europe and North America, with a big fan base.

Associate Member

Broadcasting Association of Nepal (BAN)

Since September 2016, the ABU has had a new Associate Member. Founded in 2003, the Broadcasting Association of Nepal is an umbrella organisation of all the privately owned FM stations in Nepal. The BAN has been advocating the welfare of its members since the time of its establishment. Witnessing several ups and downs in the country, the BAN has always stood in the front to support democratic movements and social transformation.

Besides political movements, BAN has been working to create social harmony and sustainable peace in the country by broadcasting various kinds of programmes in various local languages through its members.

Korea Force Network Television Service (KFTS)

KFTS is a Free-to-Air TV broadcasting organisation which focuses on defence security in South Korea. It is mainly a military channel operating under the Korean Ministry of Defence. It started its operations in 2005 and has more than 7,000 subscribers and 20,000 viewers today. The major military content of the channel is as follows: Defence News, Zoomsin, dmz, Advanced a Powerful Force 24 and Mother goes into the army.

KFTS employs about 100 people mostly on a freelance basis. The Chief Executive Officer is Mr Iseop Kwon.



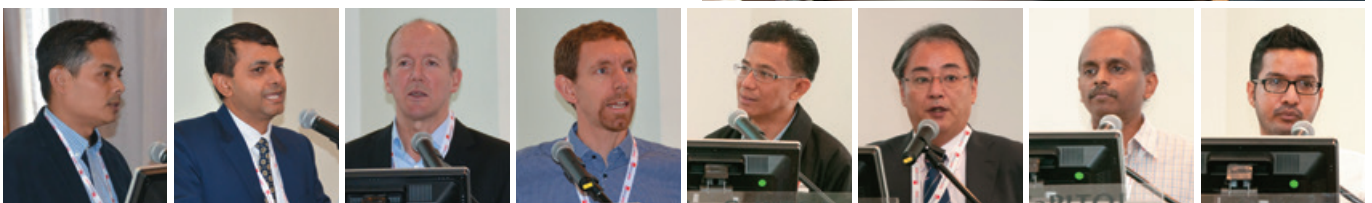
4th Regional Workshop on OTT and IBB Technologies, Standards and Services for Media

Brief Summary and Key Takeaways from the Workshop

The fourth *Integrated Broadcast Broadband (IBB) and Over-the-Top (OTT) Workshop on Technologies, Standards and Services for Media* was held in Kuala Lumpur from 27th to 29th September. On 30th September participants visited Mediaprima, one of the key media operators in the Asia-Pacific region. The more than sixty participants who attended the workshop gained new knowledge or better understanding of the subjects of IBB & OTT which have been subject of discussion over a number of years. Twenty speakers shared their experiences and information on IBB systems, architectures and standards, as well as the services that they could support. The panel also debated further marriage between OTT and IBB. Participants were all agreed that, though the over-the-air (OTA) audience share has declined a little, based on average hours of television viewing per person, OTA is still the main form of delivery via DTT – digital terrestrial TV and DTH – direct to home satellite). Online viewing is growing, but it is not totally eroding linear broadcast viewing. On-line viewing has a positive impact on linear television viewing as it promotes and builds a broadcaster/viewer relationship and stimulates addition interest in a given programme. This is the utility and value contribution of interactivity to the integrated broadcast-broadband television and radio services.

Some Observations Made During the Workshop:

Some misuse of jargon and inappropriate use of certain 'buzz words' were observed in some discussions and from some participants. Some players in evolving media still do





not understand the components, mechanisms, potential and limitations of the ever-evolving technologies and services in the broad media industry and media market. However, at the end of the workshop, most doubts and misunderstandings were cleared. All participants were very appreciative of the event and will be looking forward to next year's event with a greater IP technology emphasis and more issues centred on IP in broadcasting. Distinction needs to be made between social media and main stream media. The regulatory aspects and use of social media needs to be addressed and all stakeholders need to be educated. Those participants learned a lot about 'second screen', or companion screen that has been incorporated to IBB engines. A month ago version 2.0.1 of HbbTV was announced, with enabling of the companion screen as an enhanced feature.

Even though certain countries are already on version 1.5 of HbbTV, services are already exploring the companion screen possibilities. The Hybridcast system, which operates in Japan, also has apps for companion devices based on its current version 2.0 technology capability.



ABU Members and Participants are Embracing the Concept IP

The topic of embracing the concept IP was discussed in a number of sessions and during the panel session. Most of the broadcasters were using IP in delivery to their audience and also for contribution circuits. Online presence is common and many are improving their delivery by deploying CDNs. In the APAC region no organisation has clear plans to use IP for live production yet. However, some ABU members are already studying and will explore further when certain





issues are addressed. Among these are interoperability issues and equipment support at an affordable price.

Activities that ABU Technology will be Increasing to Empower Asia-Pacific Broadcasters to Embrace IP

We can do more. ABU-TD will spearhead and lead some of those activities in the Asia-Pacific region in collaboration with our ABU members and partners. Embracing IP has been a topic we have been discussing for some time in

APAC and are continuing to do so. As many could recall, in June 2016, just prior to BroadcastAsia, APB organised a one day event in which ABU-TD with APB discussed readiness, issues and actions required to make use of economic benefits of IP in Broadcasting, especially for production. In Europe last year this was trialed in the sandbox project and Live IP Studio was demonstrated during IBC 2016 in Amsterdam in September. In October, during the ABU annual technical committee meeting, the topic will be debated in a panel session designed by Dr Amal Punchihewa, Director Technology & Innovation of ABU and themed, *Embracing IP for Media Production*. The panellists representing all media stakeholders will discuss a number of issues and opportunities in IP for Broadcasting.



ABU FESTIVAL OF TECHNOLOGY WEBINARS

This year, the webinar series, "ABU Festival of Technology Webinars" was held from 17 August to 9 September 2016. Participation was offered free of charge to ABU members and others in the industry interested in broadcast technologies and their applications.

The webinar sessions were run twice each day with one morning session, repeated in the afternoon. This was to facilitate the participation of attendees from different time zones. Each webinar session was of around 60 minutes duration, starting with presentation(s) on the subject matter by experts, followed by a Question and Answer session.

The webinar sessions were grouped under six main themes, with a total of 37 sessions over 19 days being presented throughout the month long festival. The themes were as follows:-

- Digital Radio
- Archiving, Media Management and Workflow Enhancements
- Digital Television
- Immersive Media Technologies
- Beyond HD and Alternate Delivery Platforms in Broadcast
- OTT and IBB Technologies

The ABU Webinar festival received 244 registrations from participants within and outside the region. The event recorded attendance of more than 800 participant-sessions from 110 organisations in 41 countries. Some ABU members prepared training rooms with AV projectors to allow their technical staff to participate in the webinars together.



Participants from Malaysian Communications and Multimedia Commission are attending Webinars



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IBC 2016 RAI AMSTERDAM

Thanks to Doordarshan, India and Asia Pacific Broadcasting Union, I had the twin advantage of representing both organisations under an ABU Bursary at IBC this year. It was a great opportunity to gain invaluable insight into the latest happenings in the Media and Broadcasting world and witness the technology in action. With a plethora of conferences in multiple streams to choose from and 1800 exhibitors showcasing their state-of-the-art technology and products in 15 huge halls, it was really an enchanting and fulfilling experience. The halls each had a concept and theme such as, IP Interoperability zone, IBC Future zone, IBC Launch Pad zone, etc.

IBC had made meticulous arrangement right from the registration process, with detailed floor plans on the exhibition, conference booklets and exhibitor directories, a mobile app and the IBC info channel to guide the delegates and participants to reach their intended conference hall or exhibition booth and to get the most out of it without wasting time and energy. Participants looking a little lost were immediately helped by one of the many volunteers or staff. The free shuttle from the airport and 24 hour passes on GVB lines made it more than easy, even for the first time visitor to explore IBC without any difficulty.

The theme of this year's IBC was "Transformation in the Digital Era". All the sessions and technology exhibited spoke very much about the transformation happening around the digital media and broadcasting world.

This year's IBC opened with the initial plenary session "Mad Men, Mobile and Money". Changing audiences and the impact of GAFA (Google, Apple, Facebook, Amazon) on traditional broadcasting, shifting from a mass-market ad based TV Model to a direct-to-consumer world were significant issues discussed in the plenary session.

What fascinated me most were the rapid developments and strides being made in the IP domain. The broadcasting industry is at the threshold of major technological shift and it appears that already some broadcasters have taken the great leap forward. IBC dedicated a complete zone located at hall 8, to demonstrate the potential of IP interoperability and where several companies could showcase their products and demonstrate the workflow using IP. This zone also had a functional IP production studio, courtesy of Belgian broadcaster VRT, in collaboration with EBU. Broadcasters, IT professionals and TELCOs also came together at this year's IBC and it appeared

that the interoperability hurdle was getting more or less resolved. Maybe we are nearing the end of life time of BNC. The next couple of decades may be ruled by IP, attracting significant investments and focus in this area. More than merely connecting the devices, how best the flexibility associated with the IP architecture could be leveraged for the changing need will determine its success. Of course, it needs a lot of experimenting before arriving at what would be the right way doing it. Issues like standardisation and latency need to be fully resolved. The sign that international bodies and organisations like AES, AMWA, EBU, SMPTE, VSF have come together to resolve the various issues concerning IP gives a lot of confidence. It will become essential for traditional video engineers to become adept with networking and related protocols.

Significant advancements made in UHD/4k, HDR and HFR, which provide an immersive audio, visual experience to the viewers, were quite visible at IBC. Availability of full suites of production facilities including OB vans and DSNB for producing and up-linking 4K content equips broadcasters to enhance their offerings to the consumers. Whatever the broadcasting format, broadcasters might like to source the content in 4k, which demands upgrading the existing facilities and investment.

One could not miss the IBC Future zone, which had some fascinating technology on the display like 360 degree camera in 4K, head mounted displays with 3D audio and live streaming of 360 degree content. Virtual and augmented reality might soon



Mr N Thiyagarajan,
I.N.E.S.,
Additional Director General (E)
All India Radio & Doordarshan,
South Zone, Chennai, India



Plenary keynote session



find an important place in the media industry. It will certainly help the content creators to tell their stories in new ways.

The IBC Content anywhere hub was packed with presentations and product demonstrations on OTT, Cloud technologies for end-to-end solutions right from ingest to play-out, streaming solutions, ad insertion, customizing content to provide a personalised viewing experience. Cloud facilitates even small time broadcasters to try out broadcasting through OTT. Investment in original content and data on viewers behaviours and choice would be compelling requirements for the success of OTT. Latency, buffering, intellectual property rights and territorial restrictions are some of the issues to be resolved and overcome. Although OTT is making significant strides, live and linear broadcasting would still be relevant and predominant, according to views that emerged in the discussions. For the moment, OTT could supplement traditional TV. Cloud provides numerous advantages like ease of access irrespective of the location, recovery of content in case of disaster, collaborative working. However, speed of access, cost of frequent re-usage charges and security may be the cons of cloud usage.



Exhibition area

There was a separate stream for technical paper presentations on advancements made in TV technologies. I could attend some of these and one was, 'Recent advances in Terrestrial and Mobile Video Broadcasting,' which was very relevant to Doordarshan, which has rolled out DVB-T2 services already with a focus is on reaching mobile viewers. A presentation by Erick Stare, Senior R&D Engineer from Teracom, Sweden on "WIB-A New System Concept for Digital Terrestrial Television" was very intriguing and thought provoking. He explained how the entire UHF spectrum could be used as a single wideband signal by a single transmitter per site. He also explained how there could be reduction in power and the capacity could be increased for the same coverage. This paper eventually won the IBC 2016 Best Conference Paper Award. Another session of my choice was "Enhancing the Multi-Screen Experience through Synchronisation and Personalisation" which dealt at length about the how best to deliver OTT content to different devices, and issues like delay and lack of synchronisation between multiple screens causing concern. The subsequent presentation in the same session explained how it would become easier to meet audience expectations with hybrid broadcasting.



IBC Big Screen Experience - Movie:
'The Jungle Book' in Dolby Vision and Dolby Atmos



Live from Space: NASA and Imaging

IBC also had its share of entertainment while showcasing the best technology. Two popular movies, "The Jungle Book" and "The Revenant" were screened using latest Dolby technologies. NASA displayed some of the breathtaking images from space and explained the need for high resolution cameras for their space stations.

IBC covered the entire gamut of broadcasting right from content creation, aggregation, distribution, new platforms of delivery, viewer behaviour, audience measurement, data analysis, changing advertising landscape, business models and so forth besides technological advancements in every aspects of broadcasting.



World DAB Industry Insight session: Looking to the Digital Future – Digital Switch Over Progress and Plans

I must certainly mention the "IBC-daily", giving a complete wrap up of the previous days activities and "IBC-TV on demand" with over 350 videos that gave a lot of information to both the visitors as well as non-visitors about what was happening at IBC.

When I returned from IBC amazed by the phenomenal technological advancements that are taking place in the media and broadcasting world, the words of Edward R Murrow reiterated by Lord David Puttnam in his session, that 'Unless TV Started again to teach and to illuminate and to inspire then it was no more than merely wires and lights in a box', were still reverberating.

At the end of the day, content is the king, consumer is the queen and technology is the one that performs the wedding. The right technology brings fireworks to the marriage.

I left Amsterdam immensely satisfied and benefitted.

MISSION REPORT

ABU Technical Advisory Service to Lao National Radio Vientiane, Laos, 14-24 September 2016

A ten-day ABU Technical Advisory Service (TAS) mission to Lao National Radio (LNR), an ABU member, took place from 14 to 24 September. The mission addressed a request from LNR to repair two radio transmitters: one shortwave transmitter Continental Electronic SW 417ESOKW 50kW, one medium wave transmitter Harris DX 200kW and to make a short theory and hands-on training course on radio transmitting techniques. The expert for the mission, Mr Luu Phu was from Radio the Voice of Viet Nam (VOV)



Mr Luu Phu
Deputy Director of Dong Hoi Transmission station,
Broadcast Engineering Centre, Radio the Voice of Viet Nam

The short wave transmitter, with a designed output power of 50kW, is located at the KM6 transmission station, and was manufactured by Continental. The Power Amplifier uses a 4CV100000 electronic tube and pulse-width modulation method (where the modulation signal changes the power supply to the anode of the Power Amplifier). It failed in March 2015. The technical personnel of LNR had tried to repair the transmitter, but without success.



After a few days of testing the whole device, the cause was determined to be that the Intermediate Power Amplifier (IPA) resonant circuit was corrupted, causing the transmitter to fail. After checking the entire resonance control string, I found out three fault areas: the band selection switches, the Timer Tune circuit and the 10K Ω reference position resistor of the IPA's Tune and resonance motor control, L9

of the IPA. After repairing and replacing all the faulty parts, the resonant circuit started working again.

However, when I started up the transmitter again, there was no power. I checked the radio frequency (RF) from oscillator to IPA and found that there was no RF at the output of 300W amplifier. Then I checked RF at the input of the 300W amplifier and discovered a bad connection between the RF cable from the RF control board and the input of 300W amplifier. I cleaned, and re-made the connection and started up the transmitter again, adjusting the IPA resonance and the Tune and Load of PA resonance. With this the transmitter started to work and the, output power reached 50kW without reflected power. However a problem arose in that, when there was no signal modulation, the transmitter had a high level of about 20% noise, causing very bad reception. Inspecting, cleaning and measuring the RF chain again to determine the cause, I found that the noise started from anode of the PA tube. I checked the modulation boards and the fibre optical connection but they were working well. I then checked, repaired and eliminated some power supply modules, but the noise still remained.





Finally, I found that the noise was being generated by a bad controller board in the power supply module number 6; it was generating the noise which was transferred to the anode. When I removed the bad controller board and substituted another, the noise disappeared.

I operated the transmitter again and checked all specification to find that everything was working perfectly. That day I felt very happy.

In addition, I repaired and gave guidance on fixing some frequent faults of the Harris DX200 transmitter to the LNR technical staff at KM49 transmission station. Now that transmitter is also operating well.

Because LNR's transmitter was produced in the 90s, most of the equipment and boards are old, especially, the mechanical switch contacts, which are in bad condition,



making it is difficult to repair. I had to work quite hard but I am very happy with the result.

So, my task has been completed and all transmitters are working well. I am back at work in Dong Hoi, Viet Nam. I also gained a lot of interesting job experience during this trip and would like to thank ABU and LNR colleagues for their strong support and excellent preparation for the TAS.



UPCOMING EVENTS

3rd REGIONAL WORKSHOP ON ENGINEERING FUNDAMENTALS FOR BROADCASTERS

7th – 11th November 2016, Kuala Lumpur, Malaysia

We are pleased to announce the ABU-AIBD “3rd Regional Workshop on Engineering Fundamentals for Broadcasters”, from the 7th to 11th November 2016 in Kuala Lumpur.

Media and broadcast technology and infrastructure have been evolving rapidly in recent years. This has brought many challenges to broadcast and media institutions. Not only the ‘nuts and bolts’, but also human resource requirements have changed and are changing continuously. This training aims to address both of these issues for new personnel who have developed a passion for this field.

The workshop aims to provide basic engineering fundamentals for broadcast engineers and technologists who are at the beginning of their careers. The workshop facilitates participants to learn about the current trends and advancements in broadcast technologies. It will also focus on fundamentals of IT, audio and video systems, engineering techniques and applications. The knowledge gained will help participants to build confidence in operating in an evolving media value chain.

By the end of the workshop the participants will be able to explain and apply to their work:

- The media value chain
- Basics of Audio and Video
- Concepts of signal conversion to digital and signal processing
- Converged information Technology (IT) and cloud environments
- Interoperability, synchronisation and quality of experience issues and challenges
- Radio and TV transmission and other forms of delivery
- Media delivery over multiple platforms

We look forward to your participation at the workshop.

There are no registration/participation fees for ABU members. Non-members need to pay a registration fee of USD150.00 to cover the participation costs for the five days.

2nd REGIONAL WORKSHOP ON DIGITAL RADIO BROADCASTING

21st - 25th November 2016, Kuala Lumpur, Malaysia

The Asia-Pacific Broadcasting Union (ABU), the Arab State Broadcasting Union (ASBU), the Asia-Pacific Institute for Broadcasting Development (AIBD) and the WorldDAB are jointly organising the second Regional Workshop on Digital Radio Broadcasting to be held in Kuala Lumpur, Malaysia, from 21st to 25th November 2016.

The workshop, organised by ABU-ASBU-AIBD-WorldDAB, aims to provide broadcasters and other media professionals with a clear understanding of digital radio broadcasting services, aiming to build and enhance confidence among the participants, to design, plan and operate DAB+ technology based digital radio broadcasting services. This five-day workshop will provide expert knowledge and information on the current status of digital terrestrial radio broadcasting. Topics will include interactive multimedia service and digital radio broadcasting, highlighting the issues & challenges as well as sharing some of case studies and experiences in the process of transition from analogue to digital.

The workshop is designed for a wide audience of Policy Makers, Regulators, Broadcast Engineers, Corporate Executives and Managers, i.e. middle-level managers, administrators and officials dealing with strategic planning for the introduction and business development of Digital Terrestrial Radio Broadcasting.

It is envisaged that by the end of the workshop the participants will be able to understand:

- Baseband digital signal processing for radio and sound broadcasting (analogue to digital conversion and compression)
- Transmission chain of DAB+
- DAB+ service options
- DAB+ network planning
- Linking with non-broadcast services including hybrid digital radio broadcasting
- Some regulatory and policy aspect in transition to digital

We look forward to your participation in the workshop.

There are no registration/participation fees for ABU members. Non-members will need to pay a registration fee of USD150.00 to cover participation costs for the five days.

For more details and register, please go to ABU website (www.abu.org.my)



DAB+ Workshop Programme

21 – 25 November 2016

Location:

Lecture room in the AIBD building, Kuala Lumpur, Malaysia: <http://www.aibd.org.my/contactpage>

Day 1

Monday, 21 November 2016

Time	Topics	Presenter
09:00 – 09:15	Welcome speech and opening remarks	Dr Amal Punchihewa
09:15 – 09:30	Workshop expectations	Dr Amal Punchihewa
09:30 – 10:30	Audio capture and acquisition	
10:30 – 11:00	Coffee Break	
11:00 – 12:30	Analogue to Digital conversion	Dr Amal Punchihewa
12:30 – 13:30	Lunch Break	
13:30 – 15:20	Compression and audio codecs	Dr Amal Punchihewa
15:20 – 15:30	Discussion and review of the day	Dr Amal Punchihewa

Day 2

Tuesday, 22 November 2016

Time	Topics	Presenter
09:00 – 10:30	1. Introduction to DAB+ Digital Radio - History of DAB - Audio and data services - WorldDAB - Global status update - Latest developments	Dr Les Sabel
10:30 – 11:00	Coffee Break	
11:00 – 11:45	2. Structure of DAB+ Broadcasting: Part 1: Head end system - Services and Structure - Multiplexing and stream structure - PAD types and inclusion in ETI Stream - Data services - Signalling - Advanced features - Service Linking, Announcements and EWS	Dr Les Sabel
11:45 – 12:30	Structure of DAB+ Broadcasting: Part 2: Transmission 3. Transmission overview - ETI/EDI - Modulation - Transmitters and Repeaters - Antenna Systems - Monitoring systems	Dr Les Sabel
12:30 – 13:30	Lunch Break	
13:30 – 14:30	4. DAB+ Transmitters - Current Tx technologies and architectures - Air cooled v water cooled - Output structures and redundancy options - Control and monitoring	Mr Alex Ng Gates Air
14:30 – 15:20	Structure of DAB+ Broadcasting: Part 3: Content delivery 5. Hybrid broadcasting - Review of hybrid functionality - Hybrid Radio Use Cases - Hybrid delivery methods	Dr Les Sabel
15:20 – 15:30	Discussion and review of the day	Dr Amal Punchihewa Dr Les Sabel

Day 3

Wednesday, 23 November 2016

Time	Topics	Presenter
09:00 – 9:45	6. PAD delivery systems • Playout systems and PAD Server • PAD generation methods • Workflow implications	Mr Jason Malure All In Media
9:45 – 10:30	7. Receivers • Home • Personal • Car / automobile • Smartphones • DAB+ Smartphone demonstration	Dr Les Sabel
10:30 – 11:00	Coffee Break	
11:00 – 11:45	System Planning and Design	
11:45 – 12:30	8. Planning Part 1: What makes DAB+ environmentally friendly • Power consumption and efficiency • Space and environment • Capital and Operating Costs • Comparisons with FM 9. Planning Part 2: Regulation and Policy • What do regulators do and why do we need them? • Regulation and public good • Examples from ASEAN and other countries/regions • National, Commercial and Community interests • Government support and rewards • The whole ecosystem • Digital Switch Over / Analogue Switch Off	Mr Alex Ng Gates Air
12:30 – 13:30	Lunch Break	
13:30 – 15:00	10. Planning Part 3: RF Coverage • Spectrum and regulation overview • Coverage planning theory • Propagation modelling • Tools and methods • Single Frequency Networks • Multi Frequency Networks • RF Network design	Dr Les Sabel
15:00 – 16:30	Visit to Radio and Television Malaysia	Dr Amal Punchihewa Dr Les Sabel
16:30 – 16:40	Discussion and review of the day	Dr Amal Punchihewa Dr Les Sabel

Day 4

Thursday, 24 November 2016

Time	Topics	Presenter
09:00 – 10:00	11. Planning Part 4: RF Interference • Interference modelling and analysis theory • Co-Channel – DAB+ / DAB+ • Adjacent Channel Interference DAB+ / DAB+ • Adjacent Channel Interference DAB+ / DTV • Local DAB+	Dr Les Sabel
10:00 – 10:30	12. Head-end case studies • Example deployments • End to End operation	Mr Tom Durkin Mr Andy Joseph Factum-RadioScape
10:30 – 11:00	Coffee Break	
11:00 – 11:30	12. Multiplexing System demonstration • Multiplexing system setup • Defining Services and PAD • Reconfigurations • Redundancy	Mr Tom Durkin Mr Andy Joseph Factum-RadioScape
11:30 – 12:30	13. Field Measurement Activities • What will be demonstrated and measured • How and why • Where – selected locations and demonstrations of signal types and impairments • Begin drive testing	Dr Les Sabel
12:30 – 13:30	Lunch Break (drive testing continues through the lunch period)	
13:00 – 15:20	13. Field Measurement Activities (continued) • Driving to selected locations and demonstrations of signal types and impairments	Dr Les Sabel
15:20 – 15:30	Discussion and review of the day	Dr Amal Punchihewa Dr Les Sabel

Day 5

Friday, 25 November 2016

Time	Topics	Presenter
09:00 – 9:30	13. Field Measurement Results • What was observed • How the results can be used • Why testing is important	Dr Les Sabel
9:30 – 10:30	14. Planning Part 5: Network Design • Network types • Multiplexer/Head-end location options • Connectivity options and link capacity • Cost benefit analysis	Dr Les Sabel
10:30 – 11:00	Coffee Break	
11:00 – 11:30	14. Planning Part 5: Network Design (continued)	Dr Les Sabel
11:30 – 12:00	15. System Construction • System design and documentation • Tendering • Construction planning • Project management • Performance verification • Commissioning	Dr Les Sabel
12:00 – 12:30	16. Operation and Maintenance • Network management systems • System monitoring • Maintenance programs • Operations management • On-going activities and financial control	Dr Les Sabel
12:30 – 13:30	Coffee Break	
13:30 – 14:30	17. Next steps to move forward • Regulation • Collaboration and commercialisation • Rollout timing, geography and cost	Dr Amal Punchihewa
14:30 – 15:25	Discussion and review of the day Review of the workshop and Q&A session	Dr Amal Punchihewa Dr Les Sabel
15:25 – 15:30	Closing ceremony	

WHAT WILL YOU DO NEXT?

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Spread of smartphones and changes in viewing styles

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News

from the ABU Region

SBS On Demand Enhances User Experience on iPhone and iPad

With an enhanced user experience and new user interface, the upgraded SBS On Demand app for iPhone and iPad offers users access to over 900 movies, 50 dramas, and 200 documentaries, all completely free.

The upgraded SBS On Demand app now allows users to log in from email and Facebook and provides improved search functionality. Registered users can now curate their SBS On Demand experience by adding their best-loved shows to their favourites list – search by language, country, or category – and resume playback from where they left off.

Alongside a brand new video player, the updated app features improved AirPlay support to enhance user viewing experience. The upgraded SBS On Demand app for iPhone and iPad is now available for download on the Apple App Store.

(TVtonight)

DD Freedish Renews Deal with Three Television Channels after e-auction

The Indian free direct-to-home (DTH) platform, Doordarshan (DD) Freedish, has renewed the licences of three television channels; IBN7, WOW Cinema and Bhojpur Cinema. After the 30th e-auction, DD, has finally filled up its vacant slots which have been renewed by the three channels.

Prior to this latest channel addition on DD, the DTH platform has added new channels namely Fight Sports and APN, during the previous e-auction in August this year and deals were renewed with six channels; Star Utsav, Zee Anmol, Rishtey, B4U Music, India 24x7 and Vision TV/ Housefull movies), deals being for a year.

Actually, Freedish has 80 channels encompassing genres like general entertainment channel, movies and news. While 24 of the channels are DD channels, the rest are private channels.

(Nextv India)

Mediacorp to Launch Mandarin Kids' Channel

Mediacorp's bilingual OTT service Toggle is bringing the Mandarin-language children's edutainment network Miao Mi to Singapore.

Miao Mi, Toggle Kids' first Mandarin channel, is aimed at viewers between the ages of 3 and 6. The network features a variety of animated and live-action series and family movies, as well as its own show, Miao Mi Classroom, which is hosted by the channel mascot and uses animated flash cards and songs to help little ones learn Mandarin.

Miao Mi, which comes from Celestial Tiger Entertainment, joins premium content already on Toggle Kids from Disney, Nickelodeon and Da Vinci. The network will be added to the existing Toggle Prime package at no extra cost.

(worldscreen)

NHK to create First 8K International Co-Production

The first international co-production shot entirely in 8K has been created by NHK in collaboration with France's The Louvre museum.

The Louvre: A Time Transcending Beauty, shot over ten days in January 2016, includes footage of nine famous pieces of art belonging to The Louvre, such as the Venus de Milo and the Mona Lisa. The latest technology, including wide colour gamut and high dynamic range (HDR), was used to deliver a broader spectrum of colours and contrast to create a more vivid viewing experience. The 59-minute programme also features 8K's 22.2-multi-channel sound.

Other features of The Louvre: A Time Transcending Beauty include The Grand Gallery of the Museum, Winged Victory of Samothrace and Fra Angelico: The Coronation of the Virgin. From mid-November, there will be tests broadcasts of the programme in NHK 8K. On October 25, there will be a preview screening in France for individuals associated with the museum.

(advanced-television)

MEASAT Named Regional Operator of the Year

MEASAT Global Berhad ("MEASAT") announced the company had been named "Regional Operator of the Year" in Euroconsult's 13th Annual Awards for Excellence in Satellite Communications.

The annual award, presented at the World Satellite Business Week conference in Paris on 14th September, recognises companies for outstanding accomplishments in the satellite sector. Winners are chosen by a panel of industry experts from Euroconsult, SpaceNews and Satellite Finance, assessing candidates using rigorous qualitative and quantitative criteria. MEASAT was recognised for its 2015 financial performance and strategic initiatives in Ultra High Definition and satellite broadband.

(measat.com)

AsiaSat to Provide 4K Premium Content

'4K-SAT', the Ultra-HD channel operated by Asia's premier satellite operator Asia Satellite Telecommunications Co. Ltd. (AsiaSat) will be broadcasting premium extreme and outdoor content from XTreme Video on AsiaSat 4.

XTreme Video is producing the best 4K content for extreme

sports fans worldwide. Its UHD content on 4K-SAT will include some of the most stunning extreme and outdoor content, such as the successful mountain biking series 'MTB Insights' and the world's wildest freestyle motocross show 'Masters of Dirt'.

(RapidTV News)

MediaGuru Honoured For Outstanding Contribution in Content Digitisation

MediaGuru recently received the 'Outstanding Contribution' award from the Society of Cable Television Engineers (SCTE), in recognition of the role it has played towards digitisation of audio-video content globally. The award was presented at the SCTE India Award Ceremony held at the 24th edition of Convergence India Conference and Exhibition. The event was attended by executives from Broadband, broadcast, and telecom industry, along with dignitaries from business, government, and trade media.

MediaGuru, over the years has worked with broadcasters and content owners on digitisation, archiving and preservation of audio-video content of historic value, as well as management of media assets being produced every day. Some of its recent projects include large-scale digitisation for a Qatar based Government agency, establishing digitisation infrastructure at Doordarshan, Kolkata, and media management for all of Times Group TV channels and radio stations.

(Mediaguru)

New Location and Dates for Communicast Myanmar 2016

The organiser of CommuniCast Myanmar 2016 has announced the show will move to a new location and take place later than planned this year due to changes in the availability of the main exhibition venue.

CommuniCast Myanmar 2016 will now take place from Tuesday, the 6th of December to Thursday the 8th of December, while the associated Myanmar Satellite Forum, will be held on Wednesday the 7th of December.

Last year's CommuniCast was attended by more than 2,500 delegates and visitors. This year, more than 80 exhibitors have already signed up to take part in CommuniCast 2016, with topics including ICT solutions, mobile and broadband set to be discussed, as well as satellite and broadcasting at the co-located Myanmar Satellite Forum.

Since the event was launched in 2014, mobile penetration levels in the country have grown from close to 10 percent to 55 percent by the middle of 2016. This continues to grow rapidly, with 4G services available in Yangon. In the current market, opportunities are driven by the growing mobile enterprise, satellite and broadband services and broadcasting technologies. CommuniCast Myanmar is organised by Myanmar Trade Fair Management and its international associate companies in Bangkok, Singapore and London and are members of the Allworld Exhibitions Alliance.

(Realwire)

Localised Cartoon Programmes for TV5 Philippines

Localised versions of two of Cartoon Network's most popular and highest-rating shows – We Bare Bears and The Powerpuff Girls – will air on the Philippines' free-to-air TV channel TV5.

Filipino children and families nationwide will be treated to a line-up of new series featuring recent animations from the country's number one children' channel. From October 15, every Saturday at 8am on TV5, catch the hilarious Grizzly, Panda and Ice Bear in We Bare Bears. They do everything they can to adapt to the modern-day normal life; these tech-savvy and Internet-obsessed bears try their best to find their way in the world, but it's never easy.

TV5 already hosts a daily branded block for Boomerang, Turner's sister children' brand in the Philippines. It features iconic titles including Scooby-Doo, Looney Tunes, Mr Bean and Tom and Jerry.

(RapidTV News)

GatesAir to Power Digital TV and FM Radio in Vietnam

An early adopter of DVB-T2 digital television, national broadcaster Vietnam Television (VTV) recently placed two orders for transmitter network expansions. The first project comprises four GatesAir Maxiva UHF solid-state high-efficiency transmitters – three ULXT liquid-cooled models and one UAXT air-cooled model – for unspecified VTV channels. The second project is specific to VTV5, a specialty channel serving ethnic minority communities. That project comprises two Maxiva ULXT liquid-cooled transmitters.

On the radio side, like many global regions, Vietnam is investing in existing FM infrastructure with improvement and expansion projects. Voice of Vietnam (VOV), the national radio broadcaster, recently ordered five Flexiva air-cooled solid-state transmitters – two 5kW and three 10kW models – for VOV4, which serves as the broadcaster's Ethnic Languages Channel. All three projects also include turnkey equipment, installation and commissioning services to ensure a unified process from start to finish.

(C+T News)

Myanmar Radio and TV Acquires New Upgrades

Imagine Communications has deployed its Versio integrated playout solution to support the launch of a new channel for Myanmar Radio and Television (MRTV), the MRTV Entertainment Channel.

To speed deployment and reduce the need for complex maintenance, MRTV Entertainment Channel deployed Imagine Communications' Versio, which combines automation, branding, graphics, file server, storage and master control capabilities in an integrated environment. Versio has simplified the creation and management of the MRTV Entertainment Channel and enables the company to extend its brand and content. In addition, the Imagine Communications solution provides MRTV Entertainment Channel viewers with access to high-quality content and graphics.

The MRTV Entertainment Channel is broadcast on Digital Terrestrial on DVB-T2 across the country and airs movies and educational programs. Since the 2015 General Elections, Myanmar has been carrying out media reforms, which include the transformation of state-owned broadcasting into public service broadcasting.

(apb-news)

Digital Broadcasting Update

ITU Announces New Standard for High Dynamic Range TV

HDR-TV will add texture and colour to enhance realism



ITU has announced a new standard for High Dynamic Range Television that represents a major advance in television broadcasting. High Dynamic Range Television (HDR-TV) brings an incredible feeling of realism, building further on the superior colour fidelity of ITU's Ultra-High Definition Television (UHDTV) Recommendation BT.2020. ITU's Radiocommunication Sector (ITU-R) has developed the standard – or Recommendation – in collaboration with experts from the television industry, broadcasting organisations and regulatory institutions in its Study Group 6.

The **ITU-R UHDTV Recommendation BT.2020**, approved in October 2015, represented the continuous evolution of television since it was invented in the 1930s, transforming the dim black and white screen into an ultra-high definition colour picture on large flat panel displays.

This latest **ITU-R HDR-TV Recommendation BT.2100** brings a further boost to television images, giving viewers an enhanced visual experience with added realism. The HDR-TV Recommendation allows TV programmes to take full advantage of the new and much brighter display technologies. HDR-TV can make outdoor sunlit scenes appear brighter and more natural, adding highlights and sparkle. It enhances dimly lit interior and night scenes, revealing more detail in darker areas, giving TV producers the ability to reveal texture and subtle colours that are usually lost with existing Standard Dynamic Range TV.

The HDR-TV Recommendation details two options for producing High Dynamic Range TV images. The Perceptual Quantization (PQ) specification achieves a very wide range of brightness levels using a transfer function that is finely tuned to match the human visual system and the Hybrid Log-Gamma (HLG) specification which offers a degree of

compatibility with legacy displays by more closely matching the previously established television transfer curves. The Recommendation also outlines a simple conversion process between the two HDR-TV options.

The ITU-R Recommendation BT.2100 also allows TV producers to choose from three levels of detail or resolution: HDTV (1920 by 1080), and UHDTV '4K' (3840 by 2160) and '8K' (7680 by 4320) – all of which use the progressive imaging system with extended colour gamut and range of frame-rates in ITU's UHDTV Recommendation BT.2020. (ITU)

EBU Publishes Revision of EBU R137

The EBU Recommendation R137 was first published in August 2014. Its purpose is to give technical advice to broadcasters who intend to assess new lighting equipment or to re-assess the colorimetric quality of lighting in their television production environment.



This advice is based on a mathematical calculation implemented in software and available for free download from the EBU as 'TLCI-2012.zip'. Both the "TLCI-2012" and "TLMF-2013" are specified in EBU Tech 3355 and supporting information is provided in EBU Tech 3353 and Tech 3354.

The EBU R137 was republished as a revision 2.0 with the inclusion of the following note:

TLCI-2012 has become widely accepted by the industry with many vendors now including the TLCI-2012 Qa-factor in their datasheets. However in order to clarify any potential confusion it should be noted that the differences between three sensor cameras which employ dichroic colour filters and single sensor cameras where organic dyes work independently to share light over a wider range of wavelengths was carefully considered and included in the work behind the TLCI-2012.

It is a matter of course that high-end TV/Film productions use extensive colour processing during post-production in

order to realise the desired 'colour expression' and 'sentiment' or 'look-and-feel' of the production. Any remaining and very small imperfections related to differences between 3-chip/1-chip cameras are insignificant and easily corrected in this process.

The recommendation otherwise remains unchanged. All EBU publications are available free of charge.

(EBU)

EBU Publishes Video System Requirements Beyond HDTV (EBU TR 037)



What alternatives do broadcasters have beyond HDTV? The latest EBU TR 037 highlights the potential format for production and distribution beyond HDTV considering that they do not necessarily need to be the same. The report defines four profiles – 1080p Advanced 1, 1080p Advanced 2, UHDTV Phase 2a, and UHDTV Phase 2b – that are built not only on the scientifically proven argument that a simple increase in spatial resolution will not satisfy the quality requirements for the wide adoption of a new television system but also on the commercial demand from broadcasters across Europe.

As a consequence, each profile combines the benefits of high dynamic range (HDR) and higher frame rate (HFR) with 1080p or 2160p (4k) resolution. The requirements for backward compatibility with legacy systems are also discussed for each parameter.

Last but not least, the report highlights the need for further study on issues such as HDR dynamic metadata in a production workflow, the impact of colour space and dynamic conversions to allow broadcasters to make fully advised decisions about their next infrastructures and flexible workflows. Best practice guidelines on the operational impact of parameters such as higher dynamic range production and higher frame rates from a technical and creative perspective are needed.

(EBU)

ATSC 3.0 Physical Layer Standard Approved

Next-Generation Broadcast TV Transmission System Includes More than One Dozen Key Elements



The Advanced Television Systems Committee (ATSC) has announced that the Physical Layer transmission system for ATSC 3.0 next-generation television broadcasting has been approved as a Final Standard, signaling that the standardisation process for the entire ATSC 3.0 process is nearing completion. ATSC members approved the ATSC 3.0 Physical Layer Candidate Standard through balloting completed.

The ATSC 3.0 Physical Layer (ATSC A/322) offers far more flexibility, robustness and spectral efficiency than the current digital TV broadcast standard, which was approved by the Federal Communications Commission two decades ago. The new ATSC 3.0 Physical Layer allows television broadcasters to choose from a wide variety of transmission parameters so that each station can tailor its signal to best serve its local market by providing the combination of services and coverage area best suited for the market and its terrain.

Key capabilities of the ATSC 3.0 Physical Layer include use of Single Frequency Networks, multiple physical layer pipes, and channel bonding. Selected technologies allow for data transmission with a wide range of guard intervals, forward error correction code lengths and code rates.

(ATSC)

DPP & NABA Unite To Promote Cyber Security



The Digital Production Partnership Ltd (DPP) and the North American Broadcasters Association (NABA) have published a joint document, Broadcaster Cyber Security Requirements for Suppliers, to assist manufacturers and suppliers in developing products aligning to modern cyber security standards that are fit for integration into broadcaster facilities. The recommendations will be adopted by major UK Broadcasters.

Broadcasters are now facing daily cyber assaults on their websites, IT infrastructure and systems. With this growing threat, the UK and US broadcasters have united to introduce a set of best practice requirements covering documentation and testing, authentication and security controls.

The requirements were developed by the NABA Cyber Security group and supplemented by the DPP's Cyber Security work stream (which includes representatives from BBC, BT Sport, Channel 4, Ericsson, Five, Sky and UKTV). They are available to download in a simple to follow format, and help to ensure that any services that meet the requirements will be safe to install and operate in a broadcast facility.

The Broadcaster Cyber Security Requirements for Suppliers is the latest in a new series of DPP publications focusing on Cyber Security. This includes the 10 Things You Need to Know about Cyber Security guide, and the DPP's recently released *Supplier Security Checklist and supporting User Guide*.

(Digital Production Partnership)

Equipment Trends

Stand-Alone Unit for Single-Cable 4K 12G-SDI Interface



Bluebell Opticom Ltd. has announced the launch of the BN390 stand-alone interface supporting 4K/UHDTV in broadcast studios and outside broadcast (OB) applications.

The BN390 provides infrastructure transport not only for quad 3G-SDI and two sample interleaves, but for serial 12G-SDI on both copper and fibre. It also allows for a very high-density of 3G-SDI signals to be multiplexed onto one fibre.

The BN390 reduces the cable count for a 4K signal from four cables to one for easier rigging and installation. The module supports a wide range of multiplexing and conversion modes and serves as a toolkit for many cameras and interface requirements. For example, it can convert four 3G-SDI signals to a single 12G-SDI output or vice versa, and act as the interface between two independent dual-link HD-SDI/3G-SDI signals and a single-link 3G- or 6G-SDI signal, respectively.

When used with other standard Bluebell products, the BN390 can incorporate all of the ancillary signals required to link remote 12G-SDI camera feeds with intercom audio, genlock signals, and camera control. The BN390 is compliant with SMPTE 2082 and comes with a five-year warranty. A modular card version will be available soon thereafter.

(Bluebell)

Compact SDI Router



AJA Video Systems introduced KUMO 6464, its new compact 3G-SDI router with 64 3G-SDI inputs and 64 3G-SDI outputs for high quality, cost effective signal routing in a small form factor. KUMO 6464 facilitates long cable runs,

minimizes signal interference and fits seamlessly into an array of production environments – from OB trucks and edit suites to corporate video installations and beyond.

The extremely compact KUMO 6464 offers the ability to route video with embedded audio to BNC outputs with auto re-clocking of SDI rates. It joins AJA's family of KUMO routers, which includes KUMO 3232, KUMO 1616, KUMO 1604 and the KUMO CP Control Panel. These compact 3G-SDI routers feature powerful signal control and support for full broadcast specifications through 3G-SDI, allowing high quality signal routing for a range of facilities and budgets. Each KUMO product is designed to exceed SMPTE standards and offers unique no-configuration set up via BonJour® as well as simple remote operation via LAN connectivity using an embedded web server. KUMOs can be configured for ganged dual and quad port routing, allowing multiple inputs and outputs to be grouped together for Dual Link, 4K and Ultra HD workflows.

(AJA)

Universal Media-over-IP Adapter



Advantech presented its new VEGA-3002 Universal Media-over-IP Adapter that expands on its range of IP media solutions to provide richer interface options to broadcasters moving to IP workflows. The new interface card supports low latency transmission of uncompressed or lightly compressed video over commercial-off-the-shelf IP networks according to industry agreed standards from international organisations such as SMPTE or VSF.

The VEGA-3002 comes in a convenient low power PCI Express format to enable its integration into open server architectures that improve application development flexibility and reduces time to market. In addition to its built-in dual 10GbE ports that support redundant schemes, the VEGA-3002 also features 12G-SDI and 3G-SDI connectivity and tri-level synchronisation to optimise expansion slot usage by offering a traditional SDI interface on the same board. Its rich IP media and compression capabilities are implemented

through the integration of an FPGA which allows for future firmware upgrades to the supported standards and different software-selectable configurations to support multiple application and deployment scenarios.

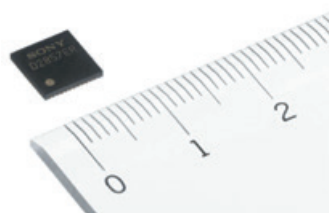
(Advantech)

ISDB-S3 Compatible Demodulator LSI and Tuner Modules for 4K and 8K Satellite Digital Broadcasts

Sony Corporation has announced the commercialisation of the industry's first demodulator LSI and tuner modules that conform to the ISDB-S3 (Integrated Services Digital Broadcasting for Satellite, 3rd generation) next-generation standard for 4K and 8K satellite digital broadcasts.

Main features

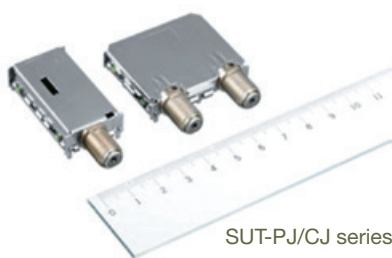
CXD2857ER demodulator LSI



CXD2857ER demodulator LSI

- The industry's first demodulator LSI that conforms to the ISDB-S3 digital broadcasting standard for advanced wideband satellites.
- Achieves stable and highly sensitive reception thanks to the incorporation of Sony's proprietary reception algorithms and error correction technology.
- Low power consumption: 0.35 W (typical for 16APSK, CR7/9)
- Conforms to various digital TV broadcasting standards: ISDB-T/C/S/S3, J.83A/B/C, J.382, DVB-T/T2/C/C2/S/S2, SBTVD-T

Tuner modules (SUT-PJ series)



SUT-PJ/CJ series tuner modules

- The industry's first tuner modules that conform to the ISDB-S3 digital broadcasting standard for advanced wideband satellites.
- Equipped with the CXD2868ER, a silicon tuner IC that supports all three Japanese TV broadcasting signals (terrestrial digital, BS/CS digital up to 3224 MHz) on one chip.
- Single, double, and triple tuner models identical in outward appearance.
- Achieve minimal noise levels due to the incorporation of Sony's proprietary noise reduction circuitry.
- Realize reduced interference from simultaneous input of multiple broadcast signals, thanks to improvements made to the filter structure.

(Sony)

4K UHD Broadcast Studio Zoom Lens



Canon U.S.A., Inc. has introduced the UHD-DIGISUPER 27, a high-optical-performance studio zoom lens for 4K UHD broadcast cameras employing 2/3-inch sensors. In addition to achieving a level of resolution surpassing that of 4K from the centre to the peripheral areas of image field across the entire focal range, the UHD-DIGISUPER 27 features the same body size and approximate weight as its HDTV predecessor, the DIGISUPER 27. The lens has a 6.5–180mm focal length range that can be ideal for a wide variety of studio productions that include news programmes and variety shows as well as major events, supporting the emerging proliferation of 4K UHD content. With the release of this new 4K UHD studio lens, Canon is expanding its 4K UHD broadcast lens line-up to meet the needs of a broadening range of industry users.

The new Canon UHD-DIGISUPER 27 features a new easy-to-hold design for easy installation for enhanced usability. Furthermore, because traditional HDTV zoom lens controllers can be used to control the electric zoom and focusing operations, users can make the transition to 4K UHD content creation using systems they are already familiar with.

The Canon UHD-DIGISUPER 27 is expected to go on sale in March 2017

(Canon)

Full software-defined Radio System



During an August meeting of the shortwave group, HFCC, the PantronX Titus II Digital Radio Mondiale receiver was unveiled.

A full software-defined radio system that is built within an Android tablet, the Titus II has a 100 kHz–2 GHz receiver onboard and decodes AM, FM, SSB and DRM natively.

Featuring a touchscreen, the receiver uses an ARM Quad-Core A53 1.2 GHz processor, 1 GB of RAM and 8 GB of onboard flash memory. It has a 7-inch TFT display and supports Android 5, 6 or custom remixes.

The system also features Filecasting, Wi-Fi capability, 5 W stereo audio, an HDMI output and a built-in RF tuner. It can be used as a desktop PC with the addition of a monitor and keyboard.

Availability: Pre-production batch – 4Q/2016, regular production – 1Q/2017

Price: Under 100USD plus shipping and local duty/taxes not included

(Radioworld)

Personalities & Posts



Mr Rahadian Gingging

Appointed Director of Technology and New Media of Radio Republik Indonesia

Mr Rahadian Gingging has been appointed Director of Technology and New Media of Radio Republik Indonesia. Mr Gingging also takes over as the ABU Technical Liaison Officer, ABU Technical Bureau member and also the ABU Technical Committee Honorary Vice-Chairman for 2016.

Mr Gingging previously held positions as Head of the Transmission Division in the TMB Directorate in Jakarta and as the Station Head in the districts of RRI Lhokseumawe, RRI Medan and RRI Jayapura. He previously held the position of National Secretary KORPRI in Jakarta.



Mr Bishnu Ram Neupane

New Technical Liaison Officer for Nepal Television

Mr Bishnu Ram Neupane, Director, Nepal Television has been appointed as the ABU Technical Liaison Officer for NTV-Nepal.

Mr Neupane began his career in Nepal Television in 1995 as a Transmission Engineer and has been Director with responsibility for planning the engineering overall for the terrestrial expansion, satellite transmission upgrading and introducing new TV technology for NTV.

Mr Neupane was previously Director, Planning and Research and International Relations from February 2013 to May 2016.



Mr Peter Mac Avock

EBU Elected New DVB Chairman

The EBU is pleased to announce that Peter MacAvock (EBU) has been elected to the role of DVB Chairman. At the 83rd meeting of the Steering Board, Peter was chosen to take over from Phil Laven who has served in the position since 2008. Peter was DVB Executive Director for 14 years before taking his current position of Head of Delivery, Platforms and Services at EBU Technology & Innovation. He takes over at an exciting time for DVB as it engages in the ongoing development of UHD TV with decisions on HDR, HFR and Next Generation Audio; future transmission systems; Study Mission Groups on Virtual Reality; amongst others. With the rising importance of OTT, Hybrid TV, and other methods of delivery, the DVB environment is changing, and DVB will adapt to meet the new challenges the TV industry is currently facing.

DVB continues to be the focal point for the technical development of the core systems used by millions of people around the world to enjoy TV. It is unique in its success at standardising a set of technologies which meets the demands of an ever changing industry, and in doing so gathers together all the stakeholders and decision makers in the industry.

ABU TECHNOLOGY CALENDAR OF EVENTS

DATE	EVENT	VENUE
2016		
31 Oct-4 November	TAS Mission to MBC-Mauritius	Mauritius
7-11 November	3rd ABU-AIBD Workshop for Engineering Fundamentals for Broadcasters	Kuala Lumpur
16-18 November	Inter BEE 2016	Tokyo
21-25 November	2nd ABU-ASBU-AIBD Digital Radio Workshop	Kuala Lumpur
29 November-1 December	1st DVB Asia Conference and Expo	Bangkok
2017		
2-4 February	23rd BES Conference and Expo	Delhi, India
6-9 March	ABU Digital Broadcasting Symposium 2017	Kuala Lumpur
13-17 March	ABU-ASBU DTV Training	Tunis

CONFERENCE • EXHIBITION • WORKSHOPS

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Because the size, format and brightness of the television sets being sold have a direct influence on viewer behaviour. That, in turn directly affects the system design of current or future television channels (and transmission head ends). Larger screens, UHD TV, smart TV in more homes will change viewing habits irrevocably. Broadcasters need to make sure that they are leading the change.

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