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Broadcasting
Union

Technical *Review*

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Cover:
*Rapid Advances
in Broadcasting
in Korea Republic*



Asia-Pacific Broadcasting Union

TECHNICAL REVIEW

From the Editor's Desk



This edition features an exclusive interview with Dr Jong Hwa Lee, Executive Director, Broadcast Technology and Strategy, KBS-Republic of Korea. He speaks to the readers of the Technical Review, providing a perspective on the transformation expected in the Korean broadcasting industry.

Also features are three invited articles from Sony-Australia, CBG/RTPRC-China and IRIB-Iran. The Sony article looks at the latest advances in High Definition Imaging in content creation and digital signal processing. The RTPRC article describes the China Mobile Multimedia Broadcasting (CMMB) pilot service. The IRIB article focuses on the transition to digital terrestrial TV broadcasting in Iran.

An overview of the 2012 ABU Technical Committee meeting, other Committee meetings and the General Assembly in Korea is offered. Also featured are the reports on some of our recent events.

A profile of our members in Korea is offered to enable other members get to know about them. We are featuring the past Chairmen of the ABU Technical Committee and the ABU distinguished service award winners.

In addition, our regular features, news from the region, updates on digital broadcasting, and new broadcasting equipment, make up the rest. Importantly, we are quite pleased that the Review has attracted advertisements from many prominent industry players.

As you may be aware, the Technical Review is also available for download on smart devices.

You may wish to see the next issue of ABU news...

- 1) 49th ABU General Assembly
- 2) ABU at 2012 London Olympics
- 3) Finalists for ABU Prizes
- 4) Radio and Television Song Festivals

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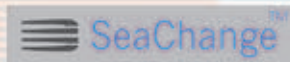
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HD Imaging Technology

by **Chris Grey**

Head of Broadcast and Content Creation Solution, Sony Corporation of Hong Kong Limited

by **Aaron Hee**

Senior Product Manager in Broadcast and Content Creation Division, Sony Electronics Asia Pacific Pte Ltd

background

Since the adoption of solid state imagers in broadcast acquisition from around the mid 1980's, there have been many improvements, such that we find in all kinds of cameras and applications, not just restricted to broadcast but also security, industrial and consumer cameras/camcorders and even smart phones and tablets. This article shares the current status in the field of content creation and also covers the fact that it takes more than just the sensor to realise the picture output. Digital Signal Processing, (DSP) is also a key part.

Image Sensor Size

Shooting in small, dark, confined places compared with well lit studios requires different tools for the different job. For this reason we find sensors are available in different sizes from $\frac{1}{4}$ " & $\frac{1}{3}$ " which we find in handy camcorders, through $\frac{1}{2}$ " in 'handys' and 'shoulders', through to $\frac{2}{3}$ " sensors which we normally find in broadcast shoulder and studio cameras. In recent years, we also have seen the trend for adopting Large Frame Sensors, so called Super 35mm, for use in Digital Cinematography, which allows the DoP to use his existing film lenses for re-creating the film look with shallow depth of field, but in the digital domain. These cameras are available in all price ranges now, competitive with the Digital SLRs that shoot video. Another factor to consider is 1-chip or 3-chip implementations. Due to the colour filter placed in the front of the single sensor, output resolution may be affected unless the sensor has an extraordinary number of pixels, as we will see later.



Figure 1: HDC2500

Starting with CCD Imagers

Although the CCD sensor was invented in the 1970's, it was not adopted in the broadcast world until the mid 1980's. The first Sony camera to feature CCD imaging was

the BVP-5, ENG/EPF unit in 1986. This of course was only capable of standard definition. We are now on the 7th generation of CCD technology which has brought us progressive scanning, improved sensitivity, improved SNR and much improved smear performance. CCD cameras are found at the high end of most camera ranges and are well accepted in the broadcast operation. The latest CCD's also give us 100/120i scanning which enables simultaneous slo-mo outputs which is particularly useful for sports. Until now specialist expensive, slo-mo cameras have been necessary for this application.

What About CMOS Sensors?

Another technology which is fast coming along the inside track is that of CMOS image sensors. Until relatively recently these have been mostly found in lesser demanding applications, but they do have advantages such as low power consumption and good low noise performance, due to the fact that the A/D conversion is placed right on the sensor itself. Now we see these sensors being used in broadcast and digital cinematography applications. Though not suffering from smear, these sensors do suffer from flashbanding when the source light changes whilst the frame is being scanned – but this can easily be removed during post. Sony recently introduced the NEX-FS700 HD camcorder which features an 11.6m pixel sensor, (in the future capable of



Figure 2: NEX-FS700

4K shooting), with high frame rate shooting of up to 240 fps in full HD of 8 second bursts, and even up to 960 fps in reduced resolution for 19 second bursts. This offers a level of creativity in a high definition camcorder, not seen before.

Sony has also recently introduced a very high end camera, the F-65, for Digital Cinematography which is using a 20Mpixel , Super 35mm, 8K CMOS sensor at the front end. This provides up to 120fps capture, with a wide colour gamut and latitude of 14 stops at ISO800.

State-of-the-art 20 Megapixel Super 35mm-sized CMOS Sensor



Figure 3: F65

The F65 camera is equipped with a newly developed Super 35mm-sized CMOS sensor to yield a total of 20 megapixels. While a typical 4K sensor has half as many green pixels as there are pixels in 4K output, the F65 sensor has one green pixel for each 4K (4096 x 2160) output pixel. This unique sensor structure delivers unparalleled resolution for 4K digital cinema content production.

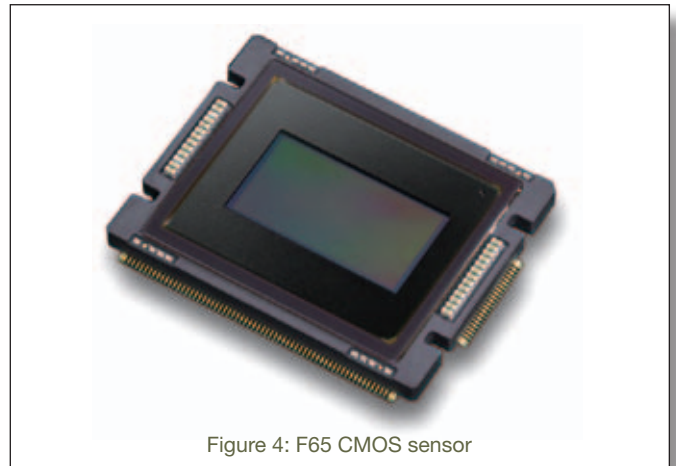
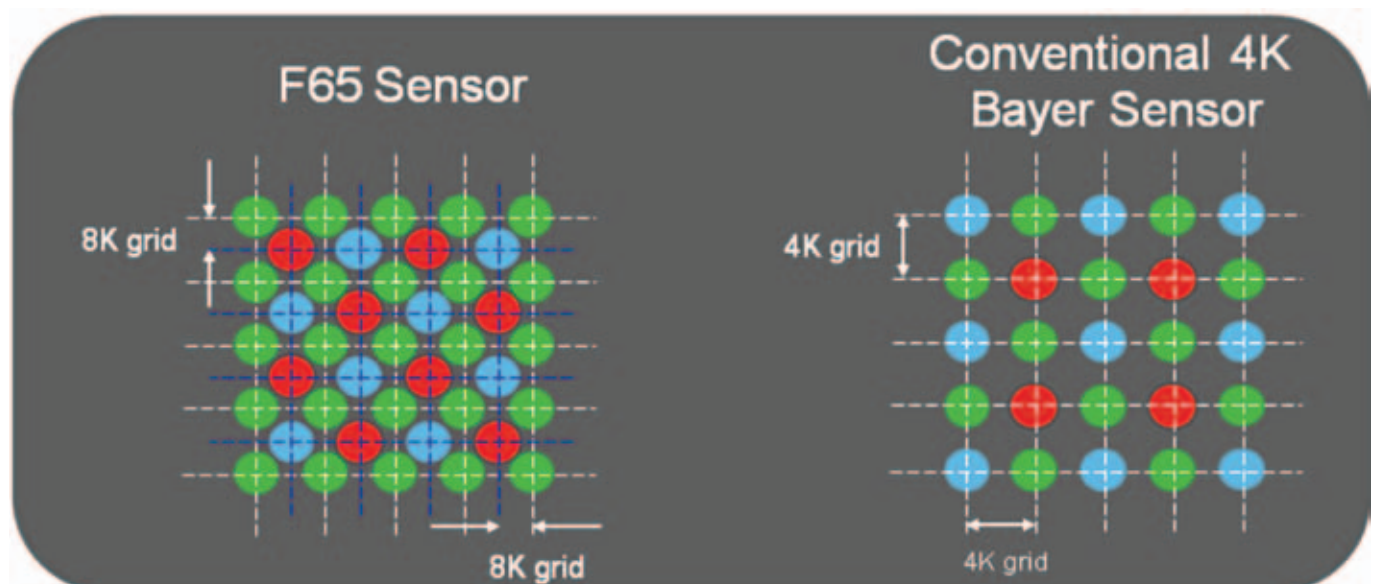
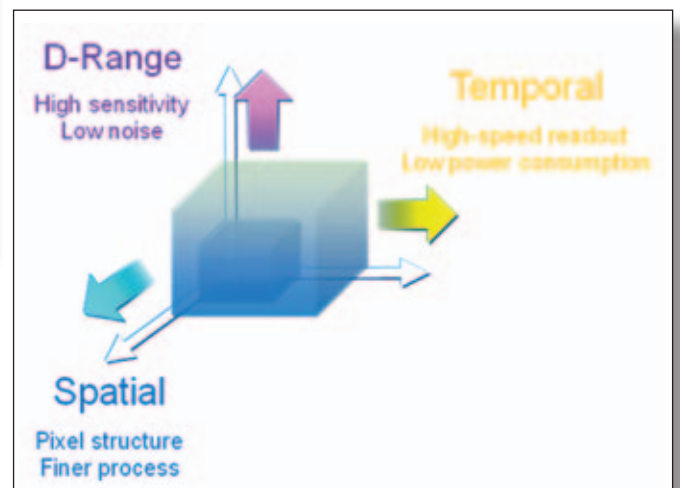


Figure 4: F65 CMOS sensor

Imaging Sensor Design Challenges

Building an image sensor with extreme quality is a major engineering challenge. Sensors have to perform in three dimensions, and all three have to be properly balanced.

The sensor in the F65 can handle a data read out speed of over 34.8Gbps, which makes it the fastest imaging sensor to date.



The DSP – Digital Signal Processor

AWB (Auto White Balance)

Unlike the human eye, cameras are not adaptive to different colour temperatures of different light source types or environments. This means that the camera must be adjusted each time a different light source is used, otherwise the colour of an object will not look the same when the light source changes. This is achieved by adjusting the camera's white balance to make a 'white' object always appear white.

Once the camera is adjusted to reproduce white correctly, all other colours are also reproduced as they should be. Manual white balance adjustments require technical skills and can be time-consuming. For this reason, professional cameras have an AWB feature that allows white balance to be automatically adjusted simply by the press of a switch. This feature comes in handy when there is no time for manual adjustments or for operators who are not familiar with white balance. AWB is often mistaken with ATW, however, the two are quite different. While ATW is 'completely' automatic and constantly adjusts the white balance in accordance with the change of the lighting environment, AWB is intended for setting the correct white balance for only one particular environment. Therefore, it must be activated each time there is a small change in the ambient colour temperature. This may seem inconvenient; however, AWB achieves a much higher level of accuracy compared to ATW.

AWB is achieved by framing the camera on a white object – typically a piece of white paper/cloth or grayscale chart – so it occupies more than 70% of the display. Then pressing the AWB button on the camera body instantly adjusts the camera white balance to match the lighting environment.

Dynamic Range

In general, dynamic range indicates the difference or ratio of the smallest and largest amount of information an electrical device can handle. For a camera, it indicates the range between the smallest and largest amount of light that can be handled. Although dynamic range is more commonly known for expressing sound clarity of an audio device, it is an equally important factor in video camera performance, which in many cases is overlooked.

While video cameras have been designed to approach the characteristics of the human eye, their dynamic ranges are still somewhat limited. The human eye has an extremely wide dynamic range that allows us to sense light and see in both very bright and dark environments. In contrast, the native dynamic range of high performance video cameras is still in the range of merely 800%. This 800% dynamic range implies that the camera's CCD can generate a video signal six times larger in amplitude than the 1.0 V video standard. The fact that our eyes can see in extremely bright environments as well as in the dark, which a video camera cannot, is a clear demonstration of the different dynamic ranges.

Despite the video camera's limited dynamic range, it is important to note that many methods have been developed to get around this and enable more effective light handling. These include Gamma (or Knee), S-Log, Automatic Gain Control, the electronic shutter and the use of ND filters.

Sensitivity

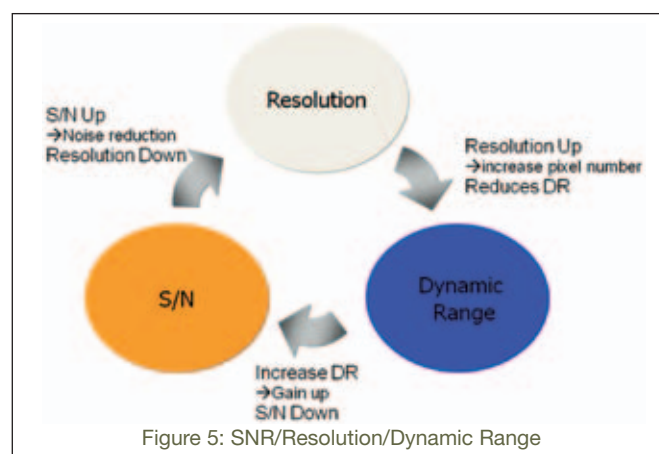
The sensitivity of a camera indicates its ability to shoot in low-light areas without noise being introduced. Sensitivity is sometimes confused with minimum illumination, but there is a significant difference between the two. Sensitivity defines a camera's raw response to light, while minimum illumination describes the lowest light level in which a camera can capture images without taking noise factors into account. For this reason, to determine a camera's true performance in low-light shooting, it is better to refer to sensitivity specifications first. Interestingly, sensitivity is described using the camera lens F-stop number. The rule of thumb is that if a camera's sensitivity specifications indicate a larger F-number, the camera provides higher sensitivity. Below is an example comparing the sensitivity of two cameras:

Camera A: Sensitivity:

f11 at 2000 lx (3200K, 89.9% reflectance)

Camera B: Sensitivity:

f8 at 2000 lx (3200K, 89.9% reflectance)



As mentioned above, the larger the F-number indication, the higher the sensitivity. In this comparison, Camera A offers higher sensitivity. It is also worth noting what the rest of the specifications mean. To make a fair comparison between cameras, sensitivity specifications are indicated with the conditions that were used to measure them. In the above two cases, a 2000 lx/3200K illuminant was used to light a grayscale chart that reflects 89.9% of the light hitting its surface. The above specifications state that sensitivity was measured by shooting this grayscale chart and evaluating the camera's response. More specifically, the camera's sensitivity is measured by opening the camera's lens iris from its closed position until the white area of the grayscale chart reaches 100% video level (on a waveform monitor). The lens's F-stop reading at this state is the camera's sensitivity.

In CCD cameras, sensitivity is largely governed by the aperture ratio (size) of the photosensitive sites and On-Chip Lens structure. The more light gathered onto each photo-sensor, the larger the CCD output and the higher the sensitivity.

All image data needs to be processed after capture and this is the role of the DSP. There are three main factors which determine picture quality: SNR, Resolution and Dynamic Range. All are inter-related as the drawing shows. To increase the Dynamic Range you need to increase your gain which will reduce SNR. If you improve your SNR, you lose resolution,

and if you increase resolution by adding pixels then your dynamic range goes down, since the sensitivity is less.

So, your priority depends on what you are shooting. In controlled environments, i.e. sets which are lit, as in studios, you can achieve a good SNR by using less gain. However, outside for news and sports, dynamic range is important due to the variation of light in the picture, good sensitivity is necessary for dark shooting, so in both cases you might increase the gain at the expense of SNR – there's no free lunch.

Another important part of the DSP is Image Enhancing. By using High Pass Filtering both vertical and horizontal detail can be improved, though it has to be limited so as

not to increase so much as to create noise in the picture. Another function is to analyse the colour content of the signal to apply control of 'skin detail'.

Conclusions CCD or CMOS?

Currently there are advantages for each of the technologies, so it rather depends on which application you are mainly focussed on. CMOS offers low power consumption, better SNR and higher sensitivity plus high frame rate shooting. CCD on the other hand is well accepted, does not suffer from effects such as flash banding or the rolling shutter. For the time being both will exist, though we can expect further advances in R&D in CMOS for the future compared with CMOS.

author



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Chris Grey is the Head of Broadcast and Content Creation Solutions overseeing the marketing of Sony's broadcast products and solutions in the Asia Pacific region since 2009. Prior to his current role, Mr Grey was working in Sony Professional Europe where he held various senior roles in product marketing of broadcast solutions for content creation, transmission and news production in the European market. Mr Grey is an industry veteran having spent the last 29 years working for Sony within the broadcast and professional division. He is an engineer by training and began his illustrious career at Sony Europe, in 1982.



Aaron Hee
Senior Product Manager

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

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

On Going Projects

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



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System Description of the CMMB Terrestrial Delivery System

by Rex Wang

Group Technical & Product Director, China Broadcasting Group

Introduction

China Mobile Multimedia Broadcasting (CMMB) is a mobile television and multimedia standard developed and specified in China. As the standard of digital mobile broadcasting, CMMB has changed the traditional concept of digital TV/Radio broadcasting with rich-media content delivery. CMMB users can subscribe to their favorite data services, e.g. e-newspapers, e-magazines, real-time news and broadcasting website services through the CMMB broadcasting network. By the end of 2011, the total population covered by CMMB network in China had reached 460 million and more than 20 million paid subscribers had been registered.

Technology of the CMMB System

CMMB System Architecture

CMMB uses terrestrial broadcast in the UHF band at 470~798 MHz. There are national and local service centres in the CMMB system. Customers send back messages to the service centre via the mobile network, to implement interactive services such as VOD. The structure of the CMMB system is illustrated in Fig. 1. Typically, the CMMB system includes head-end system, distribution system, transmitting system, terminals and feedback channels. To provide a national service, television and other multimedia content from the national service centre is sent to the satellite by the uplink distribution channel and delivered to the terrestrial transmission network by the downlink distribution channel. Also services, from the local service centre are transmitted to a terrestrial transmission network via fiber or microwave, to provide local service coverage. The

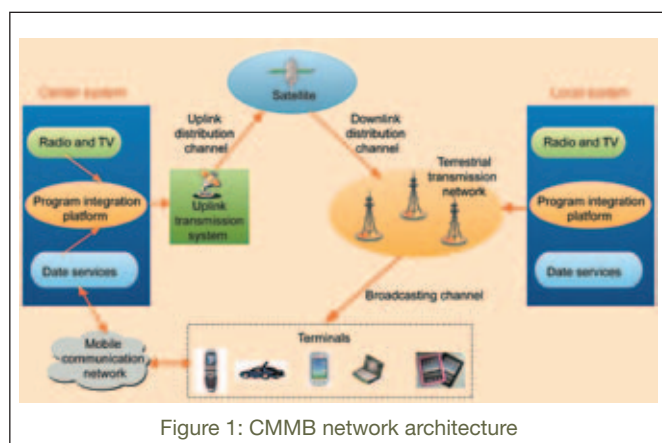


Figure 1: CMMB network architecture

terrestrial transmitters broadcast all the content received by the terminals. Combined with the feedback channel via mobile communication network CMMB has built a mobile multimedia broadcasting network which can provide both one-way broadcasting services and bi-directional interactive services. CMMB supports many kinds of terminals, such as mobile phone, GPS, laptops, car terminals, etc. As to the source coding, CMMB can support video and audio coding, such as MPEG-2, MPEG-4, H.264, AC3, AAC, etc.

CMMB Channel Frame Structure and Modulation

CMMB is designed for mobile hand-held devices with the optimisations of high sensitivity, high mobility and battery saving. LDPC channel coding is used for error correction. CMMB is based on a timeslot frame structure and OFDM modulation technique, logic channel technique and synchronisation beacon technique. The input data stream from upper layer is processed by FEC, interleaving and constellation, and then multiplexed with Scatter Pilot and Continual Pilot. Afterwards, the data is processed by OFDM modulation, and then the frame headers are inserted to form the frame in the physical layer. Finally, after up-converting, the signal is transmitted. The CMMB air interface supports frequency bandwidths of 2MHz and 8MHz, depending on spectrum availability and allocation. As to OFDM Modulation, CMMB utilises orthogonal frequency division multiplexing (OFDM) with 4K mode for 8MHz bandwidth and 1K mode for 2MHz bandwidth. For error correction coding, CMMB uses a Reed Solomon (RS) outer code and LDPC inner

Table 1: Parameters of CMMB

Bandwidth	8MHz	2MHz
Signal Bandwidth	7.512MHz	1.536MHz
Total Sub-carriers	4096	1024
Valid Sub-carriers	3076	628
Timeslot	40	
Timeslot Duration	25ms	
RS code	176, 192, 224, 240	
Rows of Outer	1/2 LDPC	72, 144, 288
Interleaver	3/4 LDPC	36, 72, 144
LDPC		108, 216, 432
LDPC	1/2, 3/4	
Inner Interleaver	384*360	192*144
CP of OFDM	1/8	
Scatter Pilots	1/8	
Continual Pilots	82	28

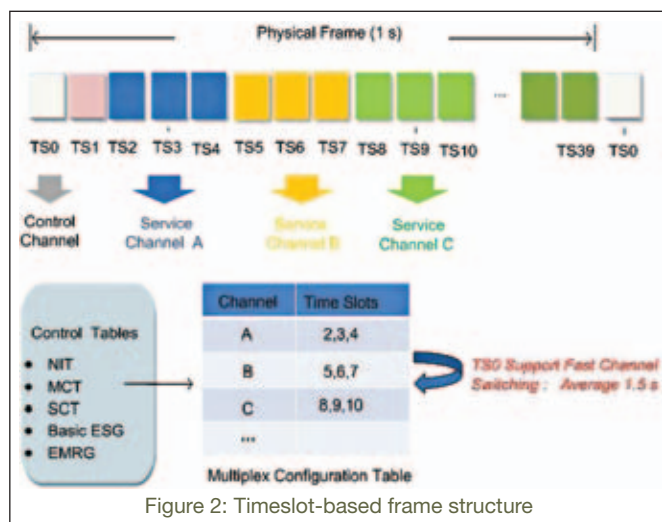
code. The LDPC code is at the rate of 1/2 and 3/4. LDPC coding greatly improves the reception performance. The parameters and throughput of CMMB are shown in the following Table 1 and Table 2.

Table 2: Throughput of CMMB

Capacity Level	Configuration		Throughput
	Modulation	Code Rate	
1	BPSK	1/2	2.046 ~ 2.764
2	BPSK	3/4	3.304 ~ 4.113
3	QPSK	1/2	4.023 ~ 5.460
4	QPSK	3/4	6.000 ~ 8.156
5	16QAM	1/2	7.976 ~ 10.852
6	16QAM	3/4	11.930 ~ 16.243

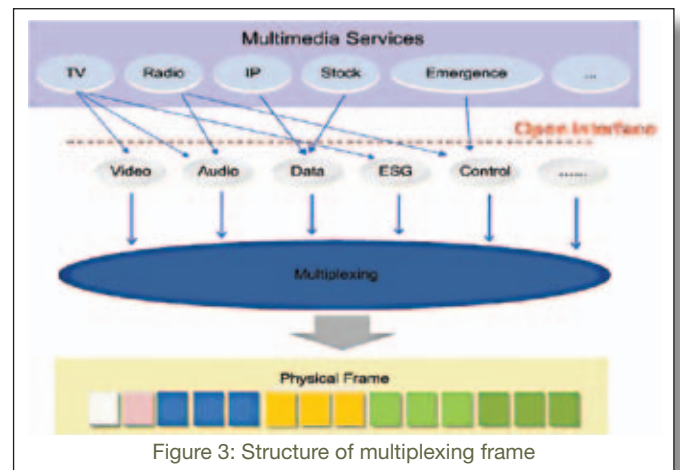
CMMB Frame Structure and Time Slot Allocation

The CMMB frame structure and timeslot allocations are shown in Fig. 2. Regarding the CMMB time-slot, each frame has a duration of one second and consists of 40 time-slots numbered from 0 to 39. Each CMMB time-slot duration is 25ms. TS0 (time-slot 0) is used for some special information and control, for example, table for fast channel switch, basic ESG for service guide, EMRG for emergency broadcasting, and so on. Based on this frame structure, only necessary time-slots are needed for a specific service. For example one TV channel only needs the support of four time-slots from this perspective, and the terminal receiving the channel only needs to receive these four time-slots. This way, CMMB time-slot technology contributes to optimising power consumption.



Multiplexing Frame Structure

The structure of the CMMB multiplexing frame is shown in Fig. 3. In the CMMB system, the function of multiplexing is to encapsulate and array the video, audio, data, ESG and other control messages into the CMMB frame and stream, in which case they can be transmitted over the CMMB



network. Video, audio or data segments coming from the same service are encapsulated in the same multiplex sub-frame to guarantee the service synchronisation. For example, the multiplex sub-frame of interactive TV contains a video segment and an interactive data segment, and the interactive data will be displayed on the player's screen while the video playback takes place in the background at the same time. The following list shows all possible combinations of segments in a multiplex frame for related services. Such a mechanism is quite flexible for the launching of further services and the only thing that needs to be done is to re-define each segment accordingly.

Combinations of segments in a multiplex frame for CMMB services:

- Traditional TV/Radio service: Video/Audio segment
- Traditional Radio service: Audio segment
- Interactive TV service: Video segment + interactive data segment
- Rich-media Radio service: Audio segment + interactive data segment
- Scheduled broadcasting or real-time broadcasting service: data segment

According to requirements of each broadcasting service the CMMB front-end system, including content management system, broadcasting control system, digital broadcasting system and multiplexer system, work together to deliver required streams over CMMB network.

CMMB Technology Advantages

There are many technical innovations and patents in CMMB core technologies, and the following Table 3 demonstrates some key points and related advantages.

There are four major technological advantages of CMMB as follows:

- Integrated with satellite transmission technology – CMMB is a technology standard which covers both satellite and terrestrial network broadcasting technologies.
- Optimisation for mobile device battery saving – CMMB adopts time-slot mode technology, and only

Table 3: CMMB key technologies and advantages

Air Interface	- Advanced OFDM Modulation - Strong Channel Coding with cascaded LDPC/RS - Deep Interleaver - Time Slot Frame Structure - Robust Sync Signal - Unique Frame Architecture with Different Bandwidth	- High Speed Mobile Reception - Low Power Consumption - Excellent Error Tolerance - Rapid Signal Capturing - Fast Channel Switching - High Bandwidth Efficiency
Protocols	- Public Broadcasting Channel - Efficient Multiplexing - Universal Audio/Video Codec - Layered ESG - Conditional Access	- Flexible Service Distribution - Real-time Service Information - Customizable Conditional Access - Outstanding in-depth Coverage
Network	- Support both SFN and MFN - Integration possibility with MN	Bandwidth & Network Expandability

necessary time-slots are received for the required TV channel. It has been proved that a 1300mA battery can support four hours of receiving and playing TV programmes.

- High transmission efficiency – Compared with DVB-H, ISDB-T, T-DMB standards, CMMB improved transmission efficiency by 15%~20%. Every 8MHz band can support 16Mbps throughput maximum.
- High mobility performance – Control information segments and data segments are separated; A specific highly protected timeslot is used for control information transmission; High-powered SFN (Single Frequency Network) covers a large area and thus reduces the chances of handover between sites. (It has been proved that CMMB devices can play TV programmes smoothly at the speed of 400km/h.)

CMMB Industry

CMMB consists of a series of related technologies from head-end system to terminal devices, which are open and free to CMMB industries. With the encouragement of intellectual property rights, it has not only formed a complete industrial chain consisting of encoder, multiplexer, modulator, exciter, transmitter, gap filler, and multiple types of receiving terminals, etc. as in Fig. 4, but also formed a large-scale industry for the CMMB system. Due to the rapid development of the industry, the signal of CMMB covered 337 major cities, 855 counties and 460 million of the population in China by the end of 2011.

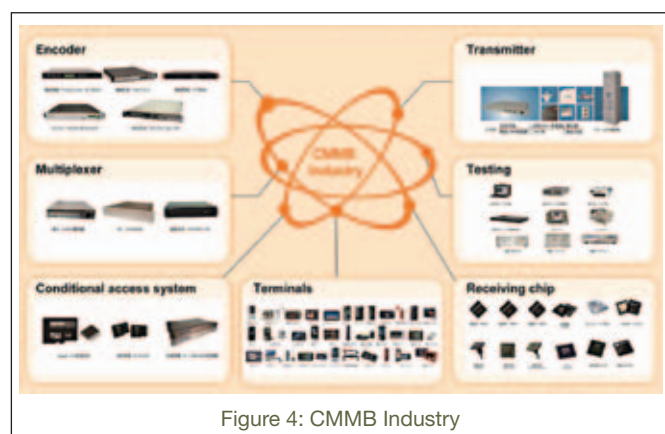


Figure 4: CMMB Industry

Services Provided by CMMB

As the description shown above, a multiplex frame combined with data segment and TV/Radio segment or combined with pure data segment has different content attributes, and thus can be used in different scenarios, which means the Operator has the capability of providing various data services correspondingly.

TV/Radio and Interactive TV/Radio Services:

CMMB has the capability of providing traditional TV/Radio services and interactive TV/Radio services. The concept of interactive TV/Radio services is to broadcast small interactive data packages in the background to accompany the TV/Radio programme. The interactive data packages are used for end-user interactive activities, e.g. voting, ranking, shopping, downloading, etc.

CMMB Scheduled Data Broadcasting Service:

Taking advantage of TV programme spare time, in the middle of the night for example, CMMB can broadcast rich media content to subscribers. In this case, the CMMB device will receive and store data at the scheduled time if the content has been subscribed to. Various content types are supported including e-newspaper, e-magazine, short videos, news, etc. Normally, the size of a single data file package is from 1MB to 10MB.

CMMB Real-time Data Broadcasting Service:

Under real-time data broadcasting mode, only very small bandwidth of the broadcasting network is used for real-time data delivery. In this situation when users open the application, the CMMB device will start to receive data from the wireless broadcasting network, and the specific application will parse the data packages and display them on the screen. It is applicable to deliver real-time news, financial, traffic navigation information and other small data packages supported services. Usually, the size of each data package is limited to between 10KB and 512KB.

Broadcasting Website Service:

Broadcasting website is an integrated service of the three data services above. The CMMB Operator can use CCMS (CMMB Content Management System) to provide e-commerce, e-publishing and integrated rich media information services. For example, Operator can provide the following services:

- TV/Radio program interactive services such as voting, ranking, shopping service, with the help of telecommunication feedback channel
- E-newspaper, e-magazine, e-novel publishing service
- Real-time news and information service
- Internet web sites/services navigation
- Music/game/app store service
- Other telecomm value added services

From this perspective, CMMB does play the role of some website services with one-way network and the help of

telecommunication network. Users can either enjoy the data files which have already been received and stored in local storage or access internet services or telecom value-added services through the delivered URLs.

Conclusion

As the CMMB system has already been operating commercially for four years, it has been proved that CMMB technology is not only suitable for TV and Radio services, but also perfect for interactive or one-way data services. The flexible CMMB multiplexing technology allows a broadcasting operator to provide various services through the CMMB network to various hand-held devices, especially smart

phones. Time-slot technology allows only necessary time-slots to be received for required service and can thus realise power optimisation. Due to all these advantages, CMMB has been undergoing rapid development in recent years.

At present, interactive TV/Radio, e-newspaper, e-magazine, instance/scheduled news and information services, e-shopping and other services have been developed based on CMMB technology, and are going to be commercially launched in the near future.

CMMB will continue the technological research and business innovation with the determination of building the world's most successful multimedia broadcasting network.

author



Rex Wang
Group Technical & Product Director, China Broadcasting Group

Worked with China Broadcasting Group as technical and product director. Mr Wang takes charge of product and service development. After 13 years in ERP software, IT service consulting, mobile widget and application R&D projects, he brings new mobile internet service concepts into broadcasting network services, successfully developed and launched new broadcasting services accordingly. Rex Wang got his engineering master degree from Beijing University of Technology in 1999 and EMBA degree from China Europe International Business School in 2012.



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Contact Bernie O'Neill, the WorldDMB Project Director for more information at bernie.oneill@worlddab.org

www.worlddab.org



Interview with Dr Jong Hwa Lee,
Executive Director, Broadcast Technology and Strategy Department, KBS

‘Making the human resource more effective and well adapted to the new broadcasting environment, while minimizing stress and boosting morale, is a major factor for a successful job-shift’

Dr Lee provides a perspective on the transformation expected in the broadcasting industry...

Addressing the readers of the Technical Review, Dr Jong Hwa Lee, Executive Director, Broadcast Technology and Strategy, KBS-Republic of Korea, outlines the changes that have taken place in the broadcasting industry in the last few years and offers his vision of the new profile of the industry in the near future. Sharad Sadhu 'interviewed' him via e-mail.

Sharad: Dr Lee, thank you very much for addressing our readers. KBS has been a pioneer in developing mobile broadcasting technologies and also Internet based applications. This has given a new impetus to the broadcasting industry in the region. Some of these technologies have also been assimilated by the European broadcasters. Please let us know more about the technologies developed by KBS and the broadcasting industry in the Republic of Korea.



Dr. Jong Hwa Lee: The broadcasting environment in Korea has experienced rapid changes during the last few years. With world-class electronics and network industries flourishing in Korea, the broadcasting industry is also actively developing and introducing new technologies.

In 2005, KBS started the world's first mobile broadcasting, TDMB, and in 2010 the first service of terrestrial 3DTV

Dr Lee have moved to another position in KBS

was put out. Additionally, we have been one of the leaders in technology for SMART TV and OHTV (Open Hybrid TV).

More recently, in 2011 KBS launched an N-screen service called Player 'K' introducing a new paradigm to conventional VOD and streaming services.

KBS is also actively researching technologies for UHDTV (Ultra High Definition TV) which is emerging as the next-generation broadcasting favourite together with 3DTV.

“‘K’ service, which heralded a new era, enables user to view KBS content through smart phone, tablet PC, and PC with the same UX (user experience) and UI (user interface). We will keep Player ‘K’ operable on every user device coming in the future.”

In the background of these new media technologies, there is the KBS's file-based workflow which makes it easier and smoother to achieve diversified services in an integrated and consistent way.

Needless to say, KBS is always deeply involved in discussions for setting standards for new technologies with government and industry.

S: As we are aware, the N-Screen strategy was initially propounded by KBS. What does it mean in terms of new services and how can the broadcasters earn additional

revenue using this approach? Do you have a successful revenue model in your organisation or in Korea?

Dr Lee: In the past, TV content was only viewed through TV or PC (VOD, streaming) but with diversification of devices, content can no longer be serviced with one format. Devices having different screen ratios, sizes, download speeds and resolution should be managed to serve purposed experience. N-screen technology resolves these problems. It converts and transmits content appropriately to each such device to provide the best user experience. To provide an N-screen service, technology for automated switch of data speed, screen ratio, billing, security and applications are needed.

Convergence of the broadcasting and telecommunication industries is already in maturity, hence the classical broadcasting profit model cannot last any more. N-screen underlines the need for unidirectional broadcasting companies to switch to multimedia, bidirectional content organisations.



KBS has been developing and testing many services for smart phone, tablet PC and PC. Although there has not been a “blockbuster” success with revenue models yet, when a culture for paying reasonable fees for content gets established, we are sure to have reliable revenue flow through the N-screen service. Considering KBS is a public broadcaster, referring to the service and business model of BBC is helpful.

“KBS’s ‘Job-shift’ is regarded as a successful policy that has shown positive results with reduced personnel and yet capable of satisfying new media works.”

S: *What are the challenges currently faced by the larger broadcasters in Korea and the region, for example, on implementation of new technology, sound business planning, management and in implementing the new operational workflows?*

Dr Lee: The year 2012 is the important year of analogue switch off (ASO). The Korean government and larger terrestrial broadcasting companies have been making a tremendous effort towards smooth transition to digital broadcasting and minimising inconvenience for the viewers.

Currently, the most crucial topic is frequency restacking. Analogue broadcasting will be terminated on December 31 this year. The government has set up a plan that allots a narrow frequency band for terrestrial broadcasting. Because of this, interference and poor reception are expected to cause serious problems.

Unlike other Asian countries, Korea uses the ATSC system which needs a wider frequency range for digital TV broadcasting. If the current plan for frequency restacking is not reconsidered, terrestrial 3DTV and UHD TV may not be serviced in the future.

Securing adequate frequency resource after ASO is a common concern for broadcasters throughout the world. The ABU, EBU and the World Broadcasting Unions (WBU) have been making joint effort to solve this problem. In this regard, early and positive action is needed in those Asian and African countries which have not yet established any government policy on the 700MHz frequency range.

“Interactive service and other informative services are the merits of the N-screen approach. Seamless transfer between devices while watching content is an interesting subject of N-Screen technology.”

On the other hand, cultivating talented personnel to develop and maintain new media services is another important issue for us. KBS has worked for long years to shift its engineers from conventional jobs to new media jobs according to the progression of broadcasting technology. It can be said that the digital workflow we are now introducing means ‘job shift’ as well as ‘job efficiency’.

S: *How is KBS dealing with some of these challenges and also taking advantage of the opportunities that arise?*

Dr Lee: As for securing the 700MHz frequency range, KBS is working with other terrestrial broadcasters in Korea to persuade the government and stress to the people the importance of securing broadcasting frequency spectrum. KBS management is also working hard with the government



and the public, creating awareness of the importance of the broadcasting frequency resource.

Making the human resource more effective and well adapted to the new broadcasting environment, while minimising stress and boosting morale, is a major factor for a successful job-shift. The job-shift has been mostly done in the area of conventional transmission sites by transforming them to remote-controlled operations and reallocating the engineers.

S: *Let us look into the future. How do you see the broadcasters operating five to ten years from hence? Do you see them functioning in an entirely different environment where they are obliged to make major changes and provide many different kinds of services to compete with many types of players.*

Dr Lee: I like to point out three directions of future broadcasting; diversification, high quality and interactivity.

Broadcasting will ultimately converge with the telecommunication industry.

N-screen technology will be further developed for faster conversion between different formats; 2D and 3D, high resolution and low resolution, small screen and UHDTV, downloadable content and streamed content, etc.

UHDTV will be very common in terrestrial broadcasting and in other platforms.

Cloud computing system will take a great part in both broadcasting services and broadcasting organisations.

In the face of against these changes, broadcasting companies will not remain in the old form any more. Digital work flow will settle down to provide fast, efficient and flexible work environment.

Interactivity will have a great influence on journalism and the concept of content creation. Viewers' opinion will be collected influencing the broadcasters. Multimedia content will flourish. Smart media and social network will get fused with broadcasting in response to user demands and provide customised content.

“The most important decision to make for broadcasters is to adapt to the rapidly changing environment. How fast you change might decide how far you can go ahead of the other players.”

S: How has the introduction of digital technologies in the studios and broadcasting services benefitted the broadcasters in Korea? Do you think that digital technologies have enabled them to meet the audience demand for new types of services and platforms?

Dr Lee: Digital broadcasting provided a framework for high quality content production, diversification of broadcasting services and instant response. It has overcome many

“Progress of broadcast technology has just begun. Past TV era has ended.”

limitations that arose from the analogue platform and enabled expanded networks to provide diverse services. For example, 3DTV, OHTV, UHDTV, EPG and interactive content are all enabled or expedited by digital broadcasting.

With these digital technologies, broadcasters could fulfill their duties to the audience as well as keep their business. At the same time, audience demands for high definition content, interactivity, rich information, realistic experience and converged services were met using various features of digital broadcasting. As always, there will be more demand for newer services, and the broadcaster will follow, whatever

the cost may be, to do their duty and sometimes just to survive.

S: Do you foresee KBS taking up a more vigorous approach to helping the ABU members in upgrading their knowledge skills and sharing expertise with them?

Dr Lee: KBS has contributed to the ABU on the technology front in various ways, like the annual Digital Broadcasting Symposium, Technical Advisory Service, the ICT Roadshow, various seminars and workshops. Helping the ABU is an unsaid agenda for us.

KBS is ready to share expertise on file-based digital workflow, new media and the next-generation services with ABU members. In the near-term, I am sure, KBS will put more effort into the advancement of ABU.

S: KBS has recently offered some equipment to ABU members free of cost. How has been the uptake for that equipment and do you plan carryout more such cooperative measures.

Dr Lee: KBS is providing analogue broadcasting equipment to ABU members in goodwill for advancement of broadcasting. In late 2011, KBS donated one OB Van to TVK of Cambodia and received some good feedback.

High prices of OB vans have made it difficult for many countries to retain enough vans. With analogue switch off scheduled in the end of 2012, KBS decided to offer analogue OB Vans to ABU members. We are trying to minimise the cost of the takeover. The analogue OB vans will be sent after basic maintenance from KBS thus they can be used until digital transition of the recipient ABU members. We will also provide individual pieces of equipment together with the OB vans. KBS hopes providing such equipment will help ABU members until their digital transition.

S: As a technologist, what is your take on the future of broadcasting in the long term?



Dr Lee: Progress of broadcast technology has just begun. Past TV era has ended. Through digital technology, broadcasting we had only dreamed of earlier, has become possible.

Broadcasting has converged with other industries, to almost a point where word 'Broadcasting' lost its meaning. If I have to define the future of broadcasting, I would rather say that it is something beyond the rainbow that we cannot even imagine.

S: Thank you, Dr Lee. Your description of the modernisation of KBS and your outlook for the future of the industry will certainly inspire broadcasters to get to the next paradigm.

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2012 ABU Annual Meetings

In Seoul, Korea

The ABU 49th General Assembly (GA) and associated meetings will be held in Seoul, Republic of Korea. This year's meetings will be hosted by Korean Broadcasting System (KBS), the public service broadcaster in Korea.

The Technical Committee meetings will follow the usual format, details of which are tabled below. Eight Informal Forum sessions will take place in the afternoon of the first day and the CTO forum, successfully launched in 2010, will be held on the last day (Day-3) of the meetings. The ABU Technical Liaison Officers' meeting with ABU Technology will take place on Day-2. The Special Topic Session this year will be presented by KBS.

A symposium on gender equality in the media will take place from 10-11 October. We expect quite a large participation in this new initiative.



49th General Assembly & Associated Meetings Schedule

Wednesday 10 October	Sports Broadcast Rights Committee		Women With The Wave Forum
	Sports Finance Committee Meeting		
Thursday 11 October	Sports Group Meeting	Technical Bureau	Women With The Wave Forum
	Final Show for ABU Radio Song Festival		
Friday 12 October	Sports Group Meeting	Technical Committee	Radio Working Party
	Programme Committee		
Saturday 13 October	Programme Committee	Technical Committee	Meeting of the Presidency
Sunday 14 October	Administrative Council Meeting	Technical Committee	ABU/FES Seminar
	Final Show for ABU TV Song Festival		
Monday 15 October	Full Day Excursion President's News Conference		
Tuesday 16 October	Official Opening of 49 th General Assembly 1 st Plenary Session 2 nd Plenary Session 3 rd Plenary Session Presentation of ABU Prizes Dinner hosted by KBS President		
	Special Topic Session Professional Discussion Restricted Working Session (Full and Additional Full Members only) NHK Reception		
Wednesday 17 October			

The inaugural ABU Radio Song Festival will take place in the evening of 11 October 2012. The first ABU TV Song Festival will take place on 14 October. Both these new features promise to be exciting events.

The Programme Committee meeting will commence in the afternoon of 12 October concluding the next day. Its proceedings will include professional discussions on radio and TV topics, several reports and some other interesting elements.

The ABU Radio Working Party will meet in the morning of 12 October. This year's Radio Working Party meeting promises to be different with the experience gained on the Radio Song Festival and a lively debate on radio as a potent medium. The meeting will also focus on case studies from Asia-Pacific, looking at the changes radio needs to make.

The 49th ABU Sports Group meeting will take place on 11-12 October. It will discuss the recently completed London 2012 Olympics, as well as upcoming events such as 2013 Sea Games, Commonwealth Games 2014, Asian Games 2014, FIFA World Cup 2014 and World Athletics Championship.

The FES Seminar this year has the theme 'Beyond Broadcasting for PSBs and the Digital Tomorrow'. It will address going global, from national PSB to international media player, new media, social media and on-line strategies for smaller PSBs in the Asia-Pacific. The seminar will be held on 14 October.



A full day excursion, a normal feature of the annual meetings, has been arranged for the 15 October (the day before the GA).

The General Assembly will be held from 16-17 October at the same venue. The Special Topic Session this year will address the topic, 'Beyond the Digital Wave and the Professional discussion session will examine the question, 'News in the Smart Media Era.' In the Members' Forum, the GA will receive reports from all the Committee Chairpersons.

A meeting of the Secretaries General of the World Broadcasting Unions has been organised on 18 October. This high level meeting, representing all the eight major broadcasting unions of the world, will take some important initiatives for the progress of the broadcasting services.

 ABU 2012 Seoul		TECHNICAL COMMITTEE MEETING SCHEDULE, Seoul, 12-14 October 2012						
Time/Date	Thursday DAY 0 (11 Oct '12)	Friday DAY 1 (12 Oct '12)		Saturday DAY 2 (13 Oct '12)		Sunday DAY 3 (14 Oct '12)		
9.00 am – 10.00 am		OPENING SESSION Opening ABU Technical Awards Announcements & Presentations (JNP)		Studies of Topic Areas – Production, Transmission, Training & Services, Spectrum Bureau Proposals Keynote Presentation		Special Topic Session KBS-Korea New Recommendations & Decisions of the Technical Committee		
10.30 am – 12.30 pm		Director's Report and Industry Issues Facilitated Session: Member Developments based on their Status Reports				ABU Forum Reports Election of TC Office Bearers Member Introductions and Cooperation with International Organisations		
2.00 pm – 3.30 pm	KBS Meeting Room 1 Main Building (JNP) Technical Bureau Meeting 3.00 pm – 6.00 pm	INFORMAL FORUMS ON COMMON INTEREST TOPICS		Chairperson 2.00 pm – 2.40 pm 1. KBS-KOREA	Co-Chair 2.00 pm – 2.40 pm 2. SBS-KOREA	2.00 pm – 3.00 pm CTO Forum		
						ABU Digital Radio Forum including Workshop	Technical Information Workshops (1, 2, & 3 - 30 mins each) KBS, ZDF, Germany	Invited Presentation 1 NHK-Japan
				ABU Developing Broadcasters' Forum including workshop	Technical Information Workshops (4, 5, & 6 - 30 mins each) Worldwide, ANAL, SBS			Invited Presentation 2 TBC-Tonga
4.00 pm – 5.30 pm			2.50 pm – 3.30 pm 3. EBU	2.50 pm – 3.30 pm 4. ITU				
		4.00 pm – 4.40 pm 5. NHK-JAPAN	4.00 pm – 4.40 pm 6. ASBU & NEWTEC					
		4.40 pm – 5.30 pm 7. DVB	4.40 pm – 5.30 pm 8. WorldDMB & DRM Consortium					
				6.30 pm – 6.30 pm Chairperson Meeting of ABU TLOs				

- Tea Breaks from 10.30 am – 11.00 am (except for Day 1: 10.00 am – 10.30 am) and 3.30 pm – 4.00 pm. Lunch Breaks from 12.30 pm to 2.00 pm.

– Tea Breaks from 10.30 am – 11.00 am (except for Day 1: 10.00 am – 10.30 am) and 3.30 pm – 4.00 pm. Lunch Breaks from 12.30 pm to 2.00 pm.



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Quick Progress in Service Realisation

Many ABU members have been able to implement new technologies in a relatively short time frame. In fact there are many state-of-the-art studio facilities available within the membership, both for TV and radio content production. In addition, there are many instances of digital TV networks implementing the latest technologies and offering high quality HD TV programming.

While digital radio transmissions have not made similar progress, there are some implementations that can be used as models.

However, the question arises, what next? The moot point is whether ABU members and other broadcasters with such modern facilities should be stay 'satisfied' or should they, in addition, begin their planning for the next step in broadcasting? For some of them the next step means looking at the terrestrial/delivery of ultra HDTV content to be produced in their studios. For others it may also mean delivering high definition 3DTV content.

For the radio broadcasters, the challenge is to use all the facilities and delivery opportunities offered by digital radio broadcasting systems and provide a multimedia experience to their audiences.

The underlying issue here is that, three to five years down the road the currently modern facilities will be deemed to have become outdated, no longer fully meeting the requirements of upcoming services. Since the technological changes in the industry are quite rapid, the effective lifespan of even the most modern facilities gets gradually shorter.

So if the broadcasters have to be at the forefront of broadcasting, they have to continually evaluate their facilities and keep on upgrading them.

A case in point is the recent NHK-Japan announcement that their plans to put out an Ultra-HDTV service have been advanced from 2020 to 2016. Given this, Ultra-HDTV broadcasting is no longer a distant objective but something for which necessary planning needs to be taken up now.

While this announcement is a strong signal to the industry, showing how broadcasting will go in the near future, it is also a strong challenge to broadcasters, to update their facilities and provide the Ultra-HDTV service.

A report has been produced in the UK emphasising that all broadcasting content should, in the immediate future, be delivered via the Internet. This view is one way of looking at the equation between the airwaves-delivered media and those delivered by the Internet. As we can observe, the marketplace is so dynamic that it might not be possible to issue a dictate regarding which delivery platforms should carry future electronic media services.

There is already a huge movement towards defining the future of TV as well as the services that can be provided on the radio waves. One of the surveys conducted in this regard has actually indicated that the TV industry will need significantly more spectrum to meet current demands, notwithstanding the requirements for new types of services.

This does not mean that Internet delivered TV would necessarily be left behind, but that the competition in the two industries will grow in step with the quantum of services provided and the eyeballs to be addressed.

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

New Members

FULL MEMBER

Palestine Public Broadcasting Commission, Palestine

The Palestine Public Broadcasting Commission, representing the voice and image of the Palestinian people was established in 1993, shortly after the Oslo Accord. It started operating as a state-owned Radio and TV service in the Gaza strip with one branch office in Ramallah City under the name Palestine Broadcasting Corporation (PBC). PBC TV is available in Palestine and several neighbouring countries due to its inclusion in the Arabsat, Nilesat, Hispasat and Galaxy networks. Palestine Radio is available in Palestine, Israel, Jordan and some parts of Egypt.

Additional Full Member

Ariana Radio & Television Network, Afghanistan

Ariana Radio & Television Network launched in 2005, is located in Kabul, Afghanistan. Ariana Television (ATN) and Radio Ariana cover 33 provinces with terrestrial radio and television signals reaching a population of 20 million. ATN produces 32 programmes weekly with more than eight hours daily of all-Afghan content and operating two live trucks.

HBS TV LLC Company, Mongolia

HBS TV LLC, a private company located in Ulaanbaatar-Mongolia, is registered and licensed by the Ministry of Justice and Home Affairs of Mongolia. The TV station, called New World Television, has been broadcasting in Ulaanbaatar since 15 April 2011 and in 21 provinces of the country since 1 August 2011. Ninety five percent of New World TV's equipment is digital and seventy percent of it is high definition.

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- An excellent opportunity to gain knowledge and acquire the latest information at symposiums featuring invited guest speakers who are actively involved in the industry.

Exhibition Categories



Professional Audio Equipment Zone:

- High-end products such as consoles, mixers, audio equipment for facilities, etc. that are designed to satisfy professional needs.
- Efficient workflow systems from recording to mastering.

Professional Lighting Equipment Zone:

- Energy saving and super-luminosity LED spotlights.
- Stage-lighting equipment such as lasers and mobile lights that work together with a variety of audio and video configurations.

Video and Broadcast Equipment Zone:

- File-based workflow systems that facilitate comprehensive media management.
- HD-, 4K-, and 2K-related products as well as the latest in non-linear systems.
- Power-source equipment, batteries, measuring equipment, and converters that increase broadcasting equipment performance.
- Cranes, steadycams and other special/peripheral products that enhance the operation of broadcasting equipment.

Cross-media Zone:

- Digital signage and digital cinema products/technologies.
- 3D technology and content for filming, editing, relaying, and screening.
- IPTVs, mobile TVs, H.264 encoders, decoding-related technologies, FPU products, etc.

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Profiling ABU Members in Korea Republic



KBS (Korean Broadcasting System)

Overview

Korean Broadcasting System (KBS) is Korea's leading public service broadcaster and the most influential media organisation in the country. KBS regards it a core duty to reflect the diverse voices of Korea through the distinctiveness of its programmes. KBS is funded mostly by both license fee and income from advertisements to operate its three TV, seven radio and four DMB channels.

KBS began the country's first radio broadcasting service back in 1927 and commenced Korea's first television broadcasts in 1961. KBS has also been broadcasting HD programmes since 2001 and by the end of 2012 all of its programmes will be produced and broadcast in HD. The world's first terrestrial DMB service was launched by KBS on 1 December 2005, offering two video, one audio and one data channels.



For audiences in Asia and other parts of the world, KBS has gained international recognition for the quality and diversity of its programmes. KBS World TV, the international satellite channel which was launched in 2003, provides high quality content from KBS. The programmes are transmitted to Europe, Middle East, North Africa, America and most of Asian regions. KBS World Radio, with 56 years of history, offers 11 different language services to listeners worldwide.

The headquarters of KBS is located at Yeouido in Seoul. KBS has 18 regional stations and five overseas bureaus as well as eight subsidiary companies such as KBS Media which manages the local and global marketing of KBS contents.

Technology

KBS has been working hard to cope with rapid changes in broadcasting environments such as the emergence of smart media, ever-increasing new media services for the audience, and the digital transition of terrestrial TV. KBS's Technological plans have at their core the enhancement of its image as a No. 1 public broadcaster by making efforts to realise the value of license fees and to lead the industry towards the future digital era.

To achieve successful digital transition, KBS has been upgrading production facilities, OB vans and transmission facilities to digital facilities earlier than originally planned. KBS also paved the way for a successful completion of the digital transition through comprehensive discussion with the government on policies for frequency restacking. In preparation for ASO (Analog Switch Off) at the end of

2012, KBS secured the digital broadcasting reception ratio of 92.5% by installing new DTV repeaters and antenna at 80 DTVRs across the nation, and is still working to expand this further. The HD transition rate, now at around 86%, will be 100% by the end of 2012.

Together with digital transition, KBS is pushing a plan called 'KoreaView', which is multimode broadcasting of multiple programmes over a single 6MHz channel of ATSC. When the major terrestrial broadcasters in Korea join this plan, terrestrial TV will provide around 20 video channels and several additional audio/data channels. By serving that many programmes, KoreaView, which got its motif from UK's 'FreeView', will be a successful example that realises the public duty of a broadcaster to its audience.

Software Download Data Service (SDDS) is another benefit of digital transition in Korea, which enables the TV set to upgrade its firmware automatically using auxiliary software code inserted in the terrestrial DTV broadcast signal. KBS is cooperating with the manufacturers for the SDDS service to easily enhance the functionality of the TVs and achieve better stability.



As the main emergency broadcaster in the nation, KBS has worked very hard to develop effective means to help protect people in the event of disasters. For example, KBS is working together with the National Emergency Information Center for DMB emergency alarm data broadcasting. Emergency alarm data from the National Emergency Administration System is available through special receivers and capable DMB receivers. KBS DMB also provides traffic information that can be used by car navigators. To enhance the overall accuracy of the TPEG traffic information, KBS has developed a quality assessment system. BMW, Mercedes-Benz, and other famous car makers are using KBS DMB TPEG technology or positively considering it.

To establish the integrated content management system aiming to unify the online and mobile contents management system, KBS implemented the Phase 1 of new media integrated CMS (Contents Management System). It will prevent the redundant creation of content for each service, remove inefficient elements and provide systematic content

management. KBS has also established a plan for realising strategic user management of the CMS system and a plan for supporting integrated content service in connection with an enterprise-wide digital production system.

To promote the public value of new media, KBS has developed various new media services including numerous smart media applications (for smart tablets and smart phones) and N-screen services (for smart tablets, smart phones, PCs, and TVs). Examples are N-screen 24 hour news, integrated radio player R2, Player K for N-screen service.

Research into broadcasting technology has also made remarkable achievements. Recent achievements includes Hybrid 3DTV, UHDTV, OHTV, high efficiency HD streaming technology, high fidelity DTV exciter, and automatic an content error inspection system. Many of these technologies were on exhibition at NAB 2012 and KOBA 2012 and received good response from the attendees.

- Hybrid 3DTV sends left-eye picture over terrestrial DTV and right-eye picture over internet for the receiver to assemble synchronously.

- OHTV is mainly focusing on developing APIs for implementing 'smart' TV services on OHTV-enabled TV sets. The APIs are based on an open standard for the manufacturers and developers to build services regardless of receiver make.

Technological Cooperation

KBS has been making efforts to fulfill its role as member of the ABU by providing its expertise and participating in activities for member organisations. Keeping close relationships with neighboring organisations in Japan and China is also an important agenda for KBS.

As the host for ABU 2012 meetings, KBS is further expanding its participation in ABU activities for further contribution to the development of the ABU members and the broadcasting industry.

EBS

(Korea Educational Broadcasting System)

Overview

EBS is a public broadcasting company that aims to inform, educate, engage and enlighten people from all walks of life. EBS was established in 1974 running radio programmes as a body under the Korean Educational Development Institute and started its TV broadcasting activities in 1980. In 2000, EBS was finally re-established as a public corporation.



After years of dedication to public education in Korea, EBS has expanded its business coverage to satellite channels and online services. EBS provides lifetime education and is determined to develop into a global educational broadcasting company for public and lifelong education. EBS strives to supplement public education and to promote education for everyone. As an educational broadcasting system, EBS complements public education and contributes to cutting down unnecessary private education costs. Currently EBS is reinforcing these goals by establishing an EDRB (Educational Digital Resource Bank) to further support Korea's public education.

EBS now operates seven different channels. EBS TV is a terrestrial public channel that contains premium documentaries and preschool and youth programmes and lifelong education. EBS Radio is for reading programmes and foreign language education. In addition, there are three satellite channels to support school curricula. EBS Plus 1 is operated exclusively for high school students, helping them to prepare for the College Scholastic Ability Test (CSAT). EBS Plus 2 is a satellite channel mainly for elementary and middle school education and vocational training. EBS English is designed for general learners in order to support the English curriculum at public schools. EBS U is a newly launched channel specialised

in preschool and children's programmes. EBS America is a premium educational channel broadcasted in the US, targeting American viewers including Korean Americans.

EBS runs four websites (www.ebs.co.kr, www.ebsi.co.kr, www.ebse.co.kr and www.ebslang.co.kr) for online users. These websites offer not only the relevant information about EBS programmes but also a replay service for previously aired programmes. The EBSi website exists especially to support EBS Plus 1, so that students can easily access the EBS programmes and find useful information. EBSe is for English education and EBSLang is for general foreign language education, including Japanese, Chinese, Italian, Russian and Vietnamese.

Technology

EBS has established an optimal environment for U-Learning in order to complement public education and contribute to lifelong education. To effectively realise U-Learning EBS has built a NPS (Network Production System) and Digital Archive System and is also putting its best efforts into a successful transition to digital broadcasting, starting from 2013. EBS also implements multiscreen strategy to cope with rapidly changing broadcasting environment of smart media which enables to broadcast educational content of EBS through various mobile appliances.

EBS also strives for the development of digital broadcasting technology, such as providing 3DTV and UHDTV media service as pilot broadcasts and by implementing various experiments in smart TV technology.

As the leader in the field of smart learning, EBS has launched an EDRB (Educational Digital Resource Bank) project. EDRB is a digital textbook that contains EBS content provided in the form of 1~5 minute clips for the use of teachers in the classroom, and as self-study assistance materials for students. 46,000 references are uploaded currently on the EDRB system and EBS plans to share its content with PBS and worldwide broadcasting companies as well. Starting with its pilot service in May 2011, EBS has been providing the EDRB service since November 2011.



The Next Generation Broadcasting of SBS

(Seoul Broadcasting System)

– HD Quality 3D Broadcasting and UHD Broadcasting

SBS would like to introduce you to the world's first 2D & 3D flexible HD 3DTV Trial broadcasting service that we launched on April 3rd 2012, and the UHD 4k content and player that SBS showed at the KOBA Exhibition at the end of May 2012.



Figure 1: The 3D Trial Broadcasting scenes

1. Introduction of High Definition 3DTV Trial Broadcasting

Through the existing terrestrial broadcasting channels of SBS, we enabled all viewers, whether in 2D or 3D, to watch our broadcasting programmes, by adopting our newly developed broadcasting system (Dual Stream method). Viewers were able to watch 2D via Channel 6-1, and 3D via 6-3.

The trial broadcasts were transmitted according to the Korean, "Standards of Transmission and Reception for Terrestrial 3DTV Broadcasting", and we mainly focused on testing the flexibility of moving from 2D channels to 3D channels and back to 2D again.

The trial broadcasts were operated for about a month, and the programmes were as below:

Table 1: Trial Broadcasting Programme

Broadcasting Hours	Time	Programme	Channels
02:00~02:02:30	2 min. 30 sec.	Announcement of start of trial broadcasting	6-1(2D)
02:02:30~02:35:30	33 min.	Uulim (Resonance) – THE MASTERS: Cultural Heritage of Humanity in Korea	6-1(2D). 6-3(3D)
02:35:30~02:38	2 min. 30 sec.	Announcement of end of trial broadcasting	6-1(2D)

For the 3D trial, SBS developed the dual stream 3D content server, shown in figure 2, to send stable 3D pictures (Left picture + Right picture) in our all-in-one 3D broadcasting system. This 3D server is able to keep the left and right pictures in frame to keep them synchronized and send to the to encoder input. It supports XDCAM HD 4:2:2 MXF (Material Exchange Format).

Accompanying our effort in HD 3D broadcasting, we plan to broadcast the 2012 London Olympic Games in 3D, via an unassigned channel, with the permission of the Korean Communications Committee (KCC). We will broadcast live-3D-content from London, not only via the terrestrial network but also the IP network.



Figure 2: SBS 3D Broadcasting Server

2. Introduction of Ultra-HD (UHD) 4K Content and content-player

SBS is preparing Ultra High Definition TV Broadcasting for the next generation and we showed our 4K UHD content and exclusive player at the KOBA Exhibition in May 2012.

We shot several music programmes with a 4k camera and converted them to 3840X2160 size, encoded by H.264. (level 5.1 and High-profile). This content was played on our 4k content player at 150Mbps and 60i to an 84-inch 4k Display. From September, SBS together with KBS, MBC and EBS, will start UHD broadcasting trials on channel 66, a non-assigned channel.



Figure 3: SBS UHD 4K content

3. Introduction of N-screen Service

SBS also developed and launched an interactive Data broadcasting service, “N-screen” which started in February, 2012. This service can be received by smart phones, pads and tablets operating on the Android-OS or i-OS as well as a smart TV. The service features existing plots, cast and locations in addition to allowing the audience to participate in voting for candidate selection during audition programmes and to share feedback via SNS services, such as Twitter and Facebook.



Figure 4: SBS N-screen service

IBC's 2012 Conference Gets to the Heart of the Business of Broadcasting and Media

When examining our industry, IBC acknowledges that technology does not exist in isolation, which is why one important stream underpinning this conference, is ‘The Business of Broadcasting and Media’.

New technology, innovation and new methods of content creation can only take companies so far – in the end they have to make sound business sense. In the current landscape digital channels, online distribution platforms and potential synergies with social networking are leading to a dizzying number of potential opportunities. Therefore examining the underlying business models and long-term financial strategies of the new technological applications is becoming more important than ever.

Sessions will cover subjects as diverse as; the impact of social media on traditional broadcasting; the limitations of current metadata models; rights in the multi-platform age; the rise of Connected TV and its implications; the impact of the cloud; training; and the dramatic shifts underway in the live production sector.

Featuring some of the foremost thought-leaders in the industry, the ‘Business of Broadcasting and Media’ stream will help attendees shape their future investment strategies based on their hard-won knowledge and expertise.



There is a number of different pass types to the conference, to suit all timeframes and budgets. These range from all-inclusive passes with premium benefits, to Single Session passes. The ‘IBC Gold Pass Experience’ includes free admittance with reserved seating (although spaces are limited) to all the 60+ conference sessions. The Silver Pass includes unlimited access to the conference and exhibition, while the Bronze Pass is designed for those with less time on their hands and allows holders to select any five sessions.

(Based on text provided by IBC.)

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- **David Eun**, Executive Vice President Global Media & CEO Advisor, Samsung Electronics
- **Mike Darcey**, COO, BSkyB
- **Mark Hollinger**, CEO & President, Discovery Networks
- **John Kennedy**, VP Corporate Marketing, IBM
- **Kevin Mayer**, Executive Vice President, Corporate Strategy and Business Development, The Walt Disney Company
- **Roger Mosey**, Director of London 2012, BBC
- **Brian Sullivan**, CEO, Sky Deutschland
- **John Tate**, Director of Policy & Strategy and Chairman, BBC Studios & Post Production
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NHK's Progress Towards Practical Use of Super Hi-Vision Implementation in 2016 possible

Super Hi-Vision (SHV) broadcast technology can transmit 8K images (7680 x 4320 pixels at 60 frames per second) and 22.2-multichannel sound that is so realistic it feels as if one were actually there. We staged a public screening of SHV at this summer's London 2012 Olympic games, where we collaborated with other organisations from around the world – including the BBC and Olympic Broadcasting Services (OBS) – and brought together the results of developments that had been made thus far. Parallel with such an exciting demonstration, research and development on equipment to advance the practical use of SHV has been continuing.



Figure 1: Public screening of SHV at Akihabara, Tokyo

A prototype compact SHV camera head using a 33-megapixel colour image sensor is one of these developments. We have been able to greatly simplify the optical system, including the lens, by using a shingle-chip colour imaging system, allowing the camera to be made more compact. The size, weight, and shape of the prototype camera head being similar to those of current HD broadcast cameras. By making the camera head more



Figure 2: Dr Kubota displaying the new SHV camera

Table 1 Specifications of compact SHV camera

Items	Values
Pickup method	Single chip colour imaging
Image sensor	33-megapixel CMOS (7680 x 4320 pixels)
Image size	29.2 mm x 16.4 mm
Frame rate	60 fps
Resolution	3400 TV lines
Weight (Camera head only)	4 kg
Power consumption	45 W

compact, we have made SHV cameras considerably more portable (Figure 2). Table 1 shows the specifications of the compact SHV camera.

High Efficiency Video Coding (HEVC) is a next-generation video coding scheme that is being standardized with the aim of doubling the compression of MPEG-4 AVC/H.264. The main features of HEVC that enable it to attain higher compression include quad-tree picture partitioning, extended prediction / transformation of block sizes, precise prediction techniques, and an image restoration filter. We have developed an HEVC software decoder to simulate a SHV receiver. This software decoder is capable of real-time decoding of bit streams with higher resolutions than high-definition television (HDTV). By leveraging parallel technologies to carry out multiple processes simultaneously, it is possible to decode such high resolution images in real time.

We are also conducting research and development into large-capacity transmission technology with the aim of delivering Super Hi-Vision to households by using the next generation of terrestrial broadcasting technology. On the basis of terrestrial integrated services digital broadcasting (ISDB-T), we applied a combination of dual-polarised Multiple-Input Multiple-Output (MIMO) and ultra-multilevel Orthogonal Frequency Division Multiplexing (OFDM) technologies to expand transmission capacity and built a prototype system that successfully transmitted one Super Hi-Vision program over terrestrial waves on two UHF channels (Figure 3).

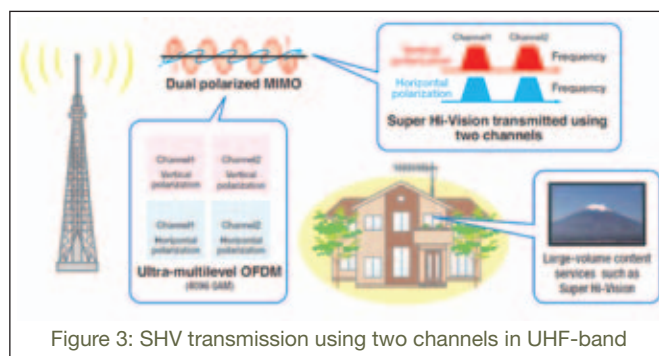


Figure 3: SHV transmission using two channels in UHF-band

A 2020 target date has been set for SHV test broadcasts in Japan. We are, however, working hard toward the practical use of SHV at an earlier date and believe that we will be able to demonstrate a more advanced SHV system around 2016.

BroadcastAsia 2012:

Focused on OTT and Next Generation Technologies



BroadcastAsia 2012 was held in Singapore from the 19th to the 22nd June 2012. It highlighted the technology growth in Asia, especially in the broadcasting and communications industries. The event was attended by participants and exhibitors from more than 56 countries around the world.

According to the statistics published, the four-day event, attracted around 49,000 attendees, with nearly 2000 exhibitors presenting the technologies of the next generation, including fibre broadband, cloud security and the DVB-T2 standard. The main focus of this year's exhibition and international conference was the integration of internet and broadcasting, namely OTT, internet connected TV and hybrid systems.

International Conference

This year the international conference was organised jointly by Singapore Exhibition Services and the ABU, with two to three tracks running in parallel everyday. The theme topics included: Broadcast and Broadband; Multi-screen delivery; file-based workflow and media asset management; monetising of content on multiple platforms; technology and green broadcasting; cloud broadcasting; outlook and business strategies for payTV, IPTV and OTT; HDTV technology and business models; DVB-T2 technology advancements and a look at the future of digital radio broadcasting. The themes were addressed in an integrated manner, looking at technologies, implementation, business models and opportunities, future outlook and case studies. The conference sessions were presented by more than 100 speakers, all well known experts in the industry. The conference included several panel discussions on selected topics of interest to the industry.



Exhibition



Since its inception, one of BroadcastAsia's attractions has been its comprehensive industry exhibition covering a wide range of products and solutions from manufacturers around the globe. The BroadcastAsia exhibition continues to serve as an important platform for TV and radio professionals in the region for finding, comparing and evaluating new technologies and solutions in one place.



The 2012 exhibition was even better, Where exhibitors presented products that looked into the integration of broadcast technologies with the ICTs and this year was even more in evidence. Many of the products had some connection to a computerised system for control or complete operations using software applications. Many of such operations are now managed via SmartApps running on mobile devices, giving more flexibility to the operators.



Transition to Digital Television Broadcasting in Iran

by Rezvaneh Sahba

Research Centre Department, IRIB

Introduction

Today, Digital Terrestrial Television's advantages are very obvious. Therefore most broadcasters and countries are at a stage of transition from analogue to digital. This process depends on the resources that a country has, terrestrial platform and the timeline. Iran's transition from analogue to digital terrestrial broadcasting is discussed in this article.

With its more than 78 million population, Iran is located in the Middle East covering an area of 1,648,195 km², neighboring 15 countries and having borders with two seas to the north and south.

Planning of DTT

Research on DTT technologies started in 1999 in IRIB's R&D department and after selecting the DVB-T standard in 2011, IRIB decided on a strategy to support local companies to develop DVB-T equipment. In 2003, there were two technical pilot trials in Tehran and Qazvin to evaluate different modes and select the best one for the country. 64 QAM modulation with 2/3 code rate and 1/8 guard interval was selected therefore the final bit rate was settled at 22.12 Mb/s. In January 2006, IRIB participated in ITU coordination and accepted that, "the transition period shall end on 17 June 2015." The 2145 UHF and 418 VHF frequencies were registered; hence an MPEG-2 headend was installed.

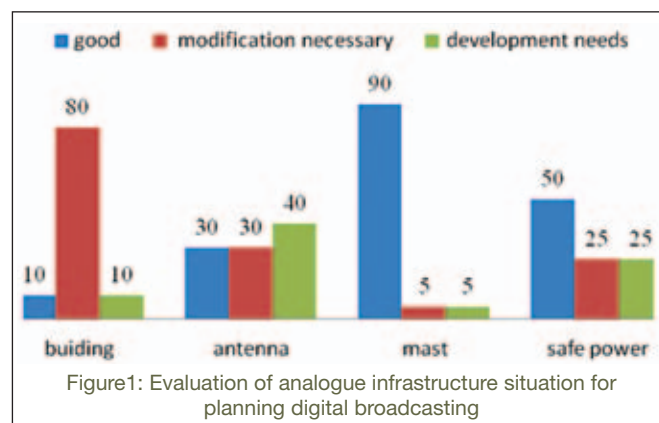
Introducing MPEG-4 to the market and comparing the two video coders, regardless of set top box prices and developments at that time, IRIB decided, in 2007, on MPEG-4. Therefore IRIB could broadcast up to eight TV channels and ten Radio channels from one transmitter.

Frequency planning was based on fixed reception with 10m height antenna and 95% of location reception. IRIB planned three frequencies in each station but in the capital city and some provinces, one analogue transmitter will need to be off. As Iran should switch off in 2015, its plan, related to percentage of population, has been prioritised. Sophisticated software has been utilised for planning network systems and coverage prediction with use of the existing infrastructure as much as possible. IRIB has selected a four phase plan for the whole country. In the first phase, 75 high power transmitters will cover 72% of the population, in the second phase, 370 stations will cover 86% of the population and in the third phase 300

stations will be able to reach 90% population coverage. The last phase will involve about 5700 stations, to cover 98% of the population.

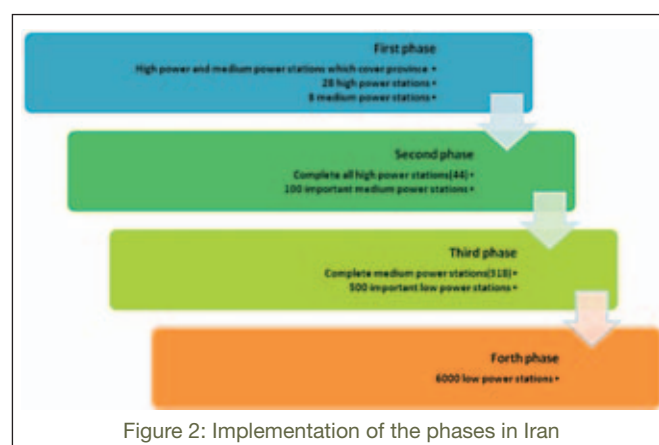
DVB-T Implementation in Iran

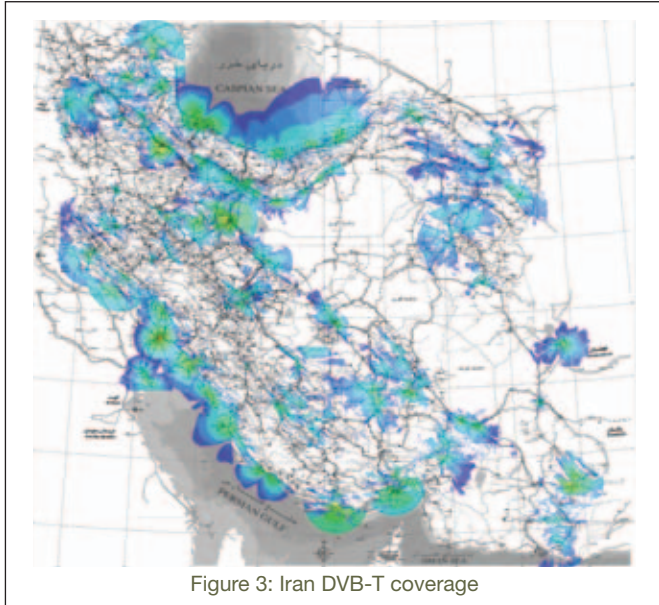
DVB-T was launched in the capital city in 2008 as a starting point for expansion in Iran. Because of difficult conditions affecting the infrastructure of 5800 stations, a committee was set up to find ways and means to reduce cost and time. The committee evaluated the resources and found the situation to be as illustrated in Figure 1.



Simulation software was used to reallocate sites and antenna equipment in existing space. Prioritized development in four phases was identified. These phases are shown in Figure 2.

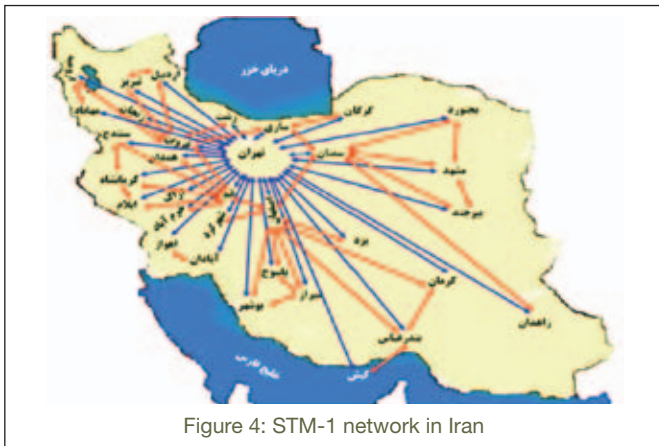
The first phase was finished by the end of 2011, with 47.22% of the population covered, as shown in Figure 3.





DVB-T Distribution

With the necessity to distribute signals, IRIB focused on satellite and fibre links together in order to distribute the signals effectively. For live content, archiving, data transaction and monitoring, IRIB settled on the STM-1 capacity and completed the development project in 2011. Now, IRIB has an SDH network that includes alternative routes for each node and also for local centers as shown in Figure 4.



Digital satellite distribution was started in 2000 and up to now 26 fixed uplink stations (16 of them in the provinces) have been used. MPEG-2 and DVB-S were used for feeding analogue transmitters. However, for digital transmitters, a better way is to use MPEG-4 and DVB-S2. But, since most home receivers support the older formats, IRIB decided to distribute in two formats. Iran has its single satellite, called Iransat, located at a longitude of 26 East, As an Iranian company produces up to 18 meters antennas.

DVB-T Management in Iran

DVB-T is a technology which originated with a research and standardisation organisation but implementing it needs strong management in IRAN. Because of IRIB's exclusive

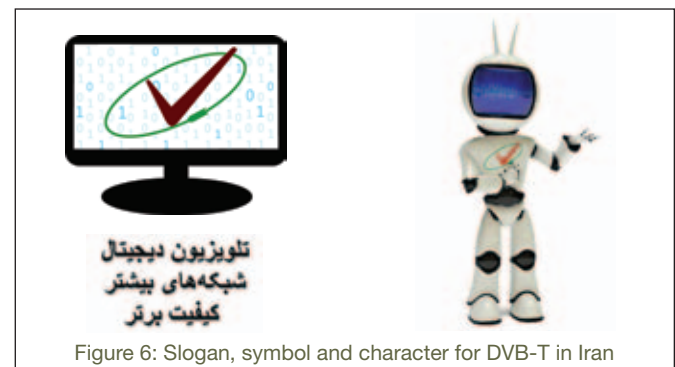
license for broadcasting, most of the responsibilities fall on that organisation, therefore they are trying to persuade government to change the digital project to a national one. Industrial management to support IRIB and its audiences were established and the committee published a receiver specification two years ago. There will be a new revision in the next two months. At the same time, Iranian companies have been developing equipment for the DVB-T chain, including encoders, multiplexer, remux, distribution chain and transmitters and now they have the ability to install and operate these. The first complete project started in one province last year as a pilot of Iranian companies' turnkey solutions for installation and operation. Figure 5 shows an example of the Iranian equipment.



A communication committee was established in IRIB in 2011 to increase the penetration rate and support audiences in transition. They have had several meetings with stakeholders in IRAN, including industry, media and government. To identify digital, a new sign and slogan was chosen as shown in figure 6. They also chose a character and new programmes are produced with this character. IRIB is also taking steps to get more information about digital to the audiences. Two websites and a call centre have been launched. One website provides a guide to finding if a location is covered by digital TV or not.

IRIB has launched three new TV channels up to now and also is planning to launch an HD format sports channel for the Olympics. Promotion and new TV channels have increased the penetration rate.

A catalyst for transition is a law, which was put in place earlier, to forbid analogue television production. Currently,



manufacturers are producing 2,500,000 sets and 2,000,000 set top boxes in one year and this is to be expanded. Most of the new TV sets in the market are smart TVs.

DVB-T Implementation Challenges:

Although Iran signed the ITU ASO agreement we cannot complete our digital coverage by a specific day. On the other hand, terrestrial broadcasting is the only official option and for that reason, it is not possible to switch off analogue unless the penetration ratio of digital receivers is high enough. Around 6000 low power stations are required to reach 100% and yet it has not been decided whether satellite or terrestrial broadcasting can achieve digital coverage completely. Although IRIB has a plan to switch its eight analogue TV channels to 24 digital ones the official

time period is not enough for this change, that is to say, without inconveniencing the public. IRIB needs to follow a gradual switch off process, keeping one analogue TV channel. And because of regulatory issues, the ASO timeline needs to be determined with parliamentary approval.

IRIB is currently broadcasting simultaneously, with EPG and, at the same time, there is a pilot on MHP and MHEG-5 services based on TS services. However, more tests and feasibility studies are necessary to find a position to implement smart TV applications.

Although having difficulties with how to manage the new developments, whether DVB-T2, IPTV or STB, IRIB is on the right track to complete the digital transition and to achieve its goals in accordance with the national agreement.

author



Rezvaneh Sahba
Research Centre Department, IRIB

Ms Rezvaneh Sahba was a Technical Committee Manager of the Second New Broadcasting, Opportunity and Challenges Conference (BOC2012) of IRIB which focused on transition to Digital Terrestrial Broadcasting. She is responsible for technical research in R&D. A specialist in digital broadcasting, she joined IRIB in 2000. Ms Rezvaneh holds a BS degree in Electrical Engineering from Tehran University and MS degrees from IUST of Iran and also in Information Technology Management.

IRIB Media Development and Technology Department:

- ❑ Provision and deployment of advanced technology in media field to cover radio and television programmes inside and outside of the country
- ❑ Study and research on technical issues in order to promote the required technologies
- ❑ Broadcasting and transmitting programmes and development of Information Technology in IRIB organization.

News

from the ABU Region

Australia

DTV Sets in House-holds

Australians' TV-viewing experience at home continues to improve as the uptake of digital TV's grows, confirming more than ever before that television is an essential-and prominent-piece of household technology, according to research release by the Australian Communications and Media Authority (ACMA).

A report found that 99% of Australian homes have at least one TV set. In total, there are about 18.7 million working TV sets in private dwellings in Australia – an average of 2.2 per household. According to ACMA 29% of house-holds had purchased a new TV set in the 12 months before the study and 70% had bought a new set in the previous three years.

By mid 2011 more than 80% of main TV sets in Australian households had been converted to digital. The main reason given for buying a new set was to get a TV set with a flat or bigger screen (69%) quality picture (66%). Nearly all TV sets bought in the past three years were digital and the switch to digital by the end of 2013 was given as a reason to buy a new set by 59% of those surveyed.

(Asia-Pacific Broadcasting)

SBS Receives Fund for New TV Service

Australia's multicultural, multilingual, free-to-air broadcaster SBS (Special Broadcasting Service) has received a Federal Budget boost, which SBS said will enable it to launch a new national free-to-air indigenous TV channel. The funding boost represents a 27% increase on SBS' base funding over the next four years.

This represents the most significant funding boost SBS has ever had, and will ensure SBS can continue to provide a unique broadcast service that includes comprehensive TV, radio and online services. The service, expected to be launched later this year, will be broadcast on a national free-to-air digital spectrum.

(Asia-Pacific Broadcasting)

Bangladesh

Digital Console for Dhaka FM

Early this year, the radio station Dhaka 90.4MHz FM began broadcasting, becoming the first digital radio station



Dhaka FM's compact digital console

in Bangladesh. The new station is part of the first group to be granted licences pertaining to "Phase II" of the government's RF licensing process that is currently under way throughout the country and as part of an ambitious programme to modernise Bangladesh's tele-communication infrastructure. Dhaka, the capital of Bangladesh and one of the major cities of South Asia, holds a potential audience of more than 11 million.

(Asia-Pacific Broadcasting)

Digital TV Services in 2014

According to Bangladesh Telecommunication Regulatory Commission (BTRC), the ITU has offered assistance for the BTRC to introduce a DTTV service. The purpose of introducing digital terrestrial television is to reduce the use of spectrum, and provide greater capacity and sharper pictures than the analogue and at lower operating costs. However the change of technology involves initial upgrade expenses.

Currently, the country has an analogue terrestrial system, because of which about 175 Mhz of bandwidth, worth Tk. 25,000 crore, is lying unused. With the implementation of DTTV, this huge amount of bandwidth can be utilised effectively and the subscribers will get better transmission, with higher resolution, the BTRC sources said.

(ABU News)

China

Pre-screening Online Video Content

China's broadcasting and Internet regulators have told Internet video providers to pre-screen all online programmes such as drama series and mini-movies before making them available online. The new rule was issued jointly by the

State Administration of Radio, Film and Television (SARFT) and the State Internet Information Office.

A statement on SARFT's website says the rule is in response to the rapid growth in online video programmes, some of which it says contain vulgar content. It says the rule will protect younger people and promote high-quality online programmes. The statement seen Wednesday says online video providers must pre-screen content before it is posted, though it does not offer specific standards.

(www.technology.inquirer.net)

China's Online Olympics Audience Breaks Records

485 million users followed CNTV-China's coverage of the games via PCs, mobile and connected devices, according to data from the broadcaster. CNTV served a total of 610 million streams to mobile phones, tablets and connected devices alone. China's online video viewing has traditionally been dominated by PC usage, and Internet-connected TVs and set-top boxes are still a rare sight. However, smart phone and tablet ownership is growing quickly. CNTV addressed this new audience with a dedicated premium offering for the 2012 Olympics.

CNTV's website registered 580 million page views and around 35 million unique viewers per day on average during the games. Page views were about 255 percent higher than daily averages before the games, and uniques were up 134 percent. At peak, it clocked 880 million daily page views, and 40 million uniques.

(www.sarft.net)

Green Lighting Education Centre

The Panasonic Center Beijing was recently awarded the first certification by the China Energy Conservation Association (CECA) as a Chinese Green Lighting Education Center. Among twenty companies selected as model centers under this first round of certifications, Panasonic is the only foreign corporation to receive this certification.

The Chinese Green Lighting Education Centers are one part of the efforts of a project to China spread knowledge on energy-saving lighting through exhibits, interactive demonstrations and platforms to stimulate the adoption of high-efficiency lighting products, thus promoting energy conservation and CO2 reduction with the participation of all Chinese citizens.

The Panasonic Center Beijing will showcase the effectiveness of lights such as spiral self-ballasting fluorescent lights, e-hf fluorescent lights, and new classic-style LED lights, along with panel displays and actual products to generate interest in hybrid lighting controls, comfortable lighting spaces and EVERLEDs.

(www.panasonic.net)

control and content distribution infrastructure to full HD operations. The new equipment is working in tandem with an automation system to help NDTV streamline its current network of channels and cost-effectively launch new channels while meeting the increasing demand for HD content throughout the country.

The migration to HD file-based workflows was seen by the channel as an investment to support HD transition in the near future. Each of the six servers with 16TB of storage – has facilitated integrated file-based workflows to support the playout and production of three nationwide news channels.

(www.broadcastengineering.com)

AIR Needs Spectrum Allocation for FM Services

All India Radio (AIR), which has a spectrum of just 4.7 MHz exclusively reserved for its FM services, will need more spectrum for setting up 385 new FM transmitters in the country under the 12th Plan. Information and Broadcasting Ministry sources said that only 100 to 103.7 MHz was presently reserved exclusively for FM broadcasting services by AIR. The broadcaster would need the additional spectrum for increasing the FM coverage to 90 per cent population. 103.7 – 108 MHz and 91.5 MHz to 95 MHz are exclusively reserved for expansion of the private sector FM services in the country.

At present, AIR FM reaches out to 41.43 percent population and 29.18 percent area. FM transmitters of varying capacities are being installed in 224 more places throughout the country by AIR. This will take the coverage to 38.75 percent area and 53.53 percent population including villages and hamlets.

(RnM – Radio and Music Team)

2015: Digital Deadline for Broadcasters?

Digitisation is a big challenge for most of the broadcasters and other players across geographies and India is on the forefront when talking about complexities. The Indian government has shown an increased focus and intent to digitise all the cable networks in the country in the draft National Telecom Policy 2011, and the formal and detailed directives in the final telecom policy are expected to be released in the coming few months.

According to estimates, out of a total 140 million households which have subscribed to pay-TV services, only close to 35 million are digital – still a long way to go for the country to see full-fledged digitisation.

While digitisation comes with its own benefits, 2015 looks a bit too ambitious to implement this. The way forward would be impossible without governments' interventions, reasonable regulations and timelines.

(Asia-Pacific Broadcasting)

India

HD File-based Workflow catches up

New Delhi Television (NDTV) has converted its entire master

Japan

Three Integral 3D Televisions

NHK is conducting R&D on integral 3D television, which

is a 3D television system that can display 3D images without the need for special glasses. This will be an even more advanced broadcasting service than Super Hi-Vision (SHV). This technology creates 3D images by reproducing light rays in real space. It uses natural light and can be processed in real time from capture to display. The images change depending on the viewpoint, just as when viewing a real object.

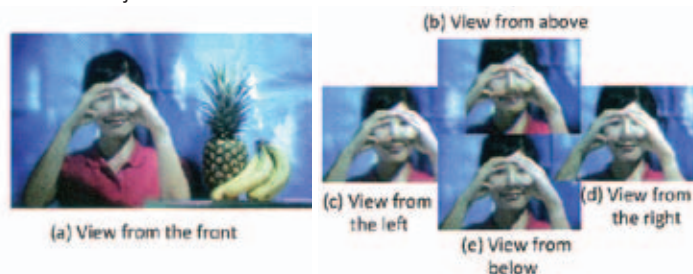


Image reproduced by integral 3D TV

Integral 3D television uses a lens array composed of tiny lenses and a high resolution imaging system for both capture and display. The 3D image has the highest resolution near to the lens array and that resolution is dependent on the pitch of the tiny lenses. The range of depths that can be expressed is dependent on the resolution of the imaging system.

(New Breeze)

Malaysia

Mobile Operator Finds Content Partners for IPTV

Malaysia's Communications service provider, Maxis announced its partnership with 14 content providers, successfully securing a wide variety of exciting content for the company's soon-to-be launched IPTV service. Through the strategic collaborations, the company delivers compelling content for individuals and families as well as interactive applications.

All these content partners will provide the first wave of rich IPTV content through the Maxis Home Fibre Internet service providing movies, series and other programmes from multiple genres. These brands and channels include seven Free-to-Air Channels namely TV1, TV2, TVi, TV3, NTV7, 8TV, TV. High speed internet services will be provided for customers to enjoy on their laptops, tablets, smartphones and now on televisions with a Fibre Internet service which is currently available to 1.2 million homes and offices.

(Digital TV News)

Singapore

Singapore Adopts DVB-T2

Singapore's Media Development Authority has announced that all free-to-air terrestrial TV channels will go fully

digital by the end of 2013 using the DVB-T2 standard. With country's migration to digital TV, free-to-air broadcaster MediaCorp will transmit all its seven FTA channels digitally by end 2013. Channels 5, 8, Suria and Vasantham will be available in HD by end 2013. The remaining three channels – Okto, Channel U and Channel NewsAsia will first be broadcast in SDS from end 2013, before being broadcast in HD in 2016.

The adoption of DVB-T2 standard comes after a successful trial conducted last year with MediaCorp and pay-TV operator StarHub. The trial, which involved some 500 households, showed that DVB-T2 was suitable for deployment in Singapore's urbanised environment. To ensure a smooth switchover, there will be a simulcast period, where both digital and analogue FTA signals will be broadcast to ensure all households have time to get accustomed to receiving their free-to-air TV signals digitally. Singapore will complete the switchover from analogue to digital broadcasting by 2020, in line with ASEAN's agreed timeframe for making the switch.

Consumers who are non-pay TV subscribers will need a DVB-T2 digital receiver and an indoor or outdoor antenna to receive digital TV signals on their current TV sets. MDA is working with manufacturers to develop the technical specifications suitable for Singapore's digital TV receivers. These digital TV receivers are expected to be available in Singapore from early next year before MediaCorp starts transmitting the free-to-air channels digitally at the end of 2013.

(Broadband TV News)

The Region

Growth for Asian Satellite Sector

The annual CASBAA Satellite Industry Forum concluded on a strong note as delegates agreed that growth opportunities for the sector in Asia remained emphatically positive. It is said that satellite services have an assured future because of their cost-effectiveness as an unrivalled platform in terms of distribution costs per channel per home and in the ability to deliver quality TV with the bandwidth to handle HD signals – especially ultra-high definition TV. With global mobile data traffic forecast to surpass 10 exabytes per month in 2016, according to a recent Cisco report, capacity will still not meet demand.

Ethnic DTH and the globalisation of Asian content are major drivers for the growth of TV in Asia while the migration from SD to HD is just one of the reasons for increased data demand. While satellite services have proliferated across the region, there are still issues that remain critical. These issues include the control of signal quality, access to markets and the opportunity to expand video consumption and viewership across the region.

(Broadband TV News)

Digital Broadcasting Update

Digital TV

HEVC Developments

A call for patents essential to the High Efficiency Video Coding ("HEVC") standard (currently HEVC Draft 7) has been announced by MPEG LA, LLC. It is intended to improve video coding efficiency for the benefit of mobile service providers and consumers and to deliver next generation higher resolution HDTV video displays for 4K and 8K Ultra High Definition TV.

In order to participate in the initial facilitation effort for the creation of a joint license, the company invites any party that believes it has patents that are essential to the HEVC Draft 7 standard (or subsequent revisions that may issue) to submit an initial patent in September 2012. A final approved standard for HEVC is expected to issue around January 2013.

(Digital TV News)

Tablet Viewing of Content Doubles

Use of tablets such as the iPad and Android-based devices by consumers for viewing TV/video content more than doubled in 14 regional markets surveyed, according to the latest study. This growth has occurred in conjunction with increased tablet adoption in these markets. The widespread tablet adoption was driven by improved connectivity infrastructure has facilitated use of these devices as alternate content-viewing devices.

Besides tablets, consumers are also leveraging other alternate electronic devices such as laptops and mobile phones to view TV/video content. The study indicates that more than 70% of consumers use alternate electronic devices such as tablets, notebook PCs, smart phones, MP3 players and desktop computers to view TV/video content. In mature markets like the U.S., the U.K. and Germany, a higher number of people viewed video content on portable computing devices. In emerging markets like China, Indonesia, Russia and Turkey, consumers reported that they view content on mobile devices such as smart phones, likely due to the relatively high penetration of wireless networks.

(Digital TV News)

Global Digital TV Penetration Crosses Halfway Mark

About 370 million digital homes were added around the world between end-2007 and end-2011 – or an average of 93 million more digital homes each year, according to a new report published recently. The study estimated that this took the digital TV household total for the 80 countries covered in the report to 675 million.

The report suggests that half the world's TV households now receive digital signals and digital TV penetration climbed from 23.5% at end-2007 to 48.5% by end-2011.

Analogue terrestrial was still the most popular platform at end-2011, accounting for 31.8% of the world's TV households, with analogue cable second at 19.5%. China became the largest digital TV household nation in 2010, rising to 149 million digital TV homes (22% of the world's total) by end-2011.

(Digital TV News)

Does Terrestrial Television Broadcasting Have A Future?

This was the question posed to the delegates of the EBU 18th Technical Assembly held in Zagreb recently. At the WRC-12 international conference in February this year a large slice of the spectrum used for television broadcasting in the analogue age was also assigned to 'wireless broadband services' in Europe, from 2015. This has set European broadcasters on edge about their future.

The assembly was told that terrestrial television broadcasting would only be superseded by a wireless broadband system if an equally efficient and free media delivery means were available to the people. It was also pointed out that there were four things that could be done with the 700MHz band: use it all for broadcasting, use it all for broadband, share the spectrum between broadcasting and broadband, or develop a 'converged' system that does both. The assembly was told that the EBU and its members should be innovative, and reminded the broadcasters that "sticking your head in the sand is not a good strategy".

(EBU Tech)

NHK brings forward Ultra-HD start date

Japan's public broadcaster is targeting to start test transmissions of its advanced Ultra-HDTV format by 2016, some four years earlier than originally planned, trustedreviews.com reports. NHK's director general for engineering delivered the news at a London demonstration of Super-HDTV held at London's Olympic Park. As previously reported, NHK, along with the BBC and other partners, used the 2012 Olympics to capture and transmit test footage to viewers at Olympic park and other UK locations as well as to Tokyo and the USA.

There has been some considerable comment, and anticipation, that European viewers will be amongst the first to experience U-HDTV transmission by about 2015-16 when pay-TV broadcasters embrace the technology. In a similar fashion, DirecTV in the USA has expressed enthusiasm for U-HDTV.

(Advanced Television)

YouView Launched

YouView, the new set top box offering subscription-free digital TV and catch-up, has launched and will be available from major retailers soon. The easy-to-use set top box is set to transform how UK viewers consume TV, taking advantage of more than 100 digital TV and radio channels, seven day catch-up and on-demand programmes from the content libraries of the BBC, ITV, Channel 4 and Channel 5 – all delivered to the viewer's main TV.

The device features an innovative electronic programme guide (EPG) that allows users to scroll back seven days to catch-up on programmes, watching in HD and record, pause and rewind of live TV. Easy-to-use search lets on-demand content to be searched by programme or even actor's name. Backed by some of the country's biggest names in TV and broadband, it brings a fully integrated service to homes across the country via a broadband internet connection, television aerial and a set top box.

(Digital TV Consultant)

MPEG and ITU-T Create Team for 3D Video Coding

A new collaboration between MPEG and ITU-T VCEG has been started by installing the Joint Collaborative Team on 3D Video Coding Extension Development (JCT-3V). The JCT-3V is responsible for developing efficient solutions in the field of 3D video (e.g. enhanced multi-view capability using video-plus-depth formats), which have been assessed to be mature for market adoption after several years of exploratory work performed in MPEG.

As a first in a series of 3D video standards that will be developed by the JCT-3V, a multiview video-plus-depth extension of AVC is being developed. This video-plus-depth extension has reached the status of Draft Amendment and will be completed in 2013.

(Digital TV News)

Internet

BBC Builds Interactive Offering

The BBC has officially unveiled its new Interactive Video Player (IVP), which made its debut for the Olympic Games. It came as the BBC looks to build a 'Connected Red Button' following confirmation of a reduction in its broadcast streams. Every sport was available live and on demand in HD quality throughout the games. The player allowed easy switching between the available 24 live streams as well as the ability to pause and rewind live video or jump straight to key moments by using chapter markers.

Planned features include the ability to instantly access catch-up TV from linear channels or send recipes related to cookery shows to the viewer's PC.

(Broadband TV News)

IP Transmission Prices Falling Fast

For broadcasters and content distributors, regarding their operational budgets for delivering file-based programming, prices for wholesale IP transmission service continue to

go down throughout the world, while accelerated declines in costs were particularly significant between the second quarters of 2011 and 2012.

The falling prices could be important to broadcast stations and groups considering centralcasting strategies or connecting with third-party software service providers for high-bandwidth feeds. According to new data the median monthly lease price for a full GigE port in London dropped 57 percent between Q2 2011 and Q2 2012 to \$3.13 per Mb/s. In New York, the comparable price dropped 50 percent to \$3.50 per Mb/s over the past year. Pricing for short-term promotions and high capacities has dropped below \$1.00 per Mb/s per month. While prices have declined globally, there are significant geographic disparities. For example, the median price of a GigE port in Hong Kong has remained 2.7 to 5.1 times the price of a GigE port in London over the past five years.

(Broadcast Engineering)

Internet Enhances Olympics Coverage

To get an idea of how much the Internet is impacting TV these days, one needs only to look at NBC's coverage of the Olympics. At the point with roughly two weeks to go, the network's website has already surpassed one billion page views – doing it in about half the time it took to reach that milestone in Beijing four years ago. At mid-point show 75 million total videos had been streamed. There were 34 million live streams and 744 million page views.

NBC's Olympics peaked at No. 1 and 2 as the top free apps for iPhone and iPad on Apple's App Store. Cable, satellite and telco providers have officially verified a total of 6.2 million devices watching the games.

(Audiostream)

MPEG-DASH Trial for London Olympics

The commercial deployment of the MPEG-DASH (dynamic adaptive streaming over HTTP) standard is one step closer with the first live public trial, presented by Belgian public broadcaster VRT. The DASH Promoters Group facilitated live MPEG-DASH streaming of the 2012 London Olympics, with DRM content protection, to demonstrate the benefits of this unifying standard for adaptive streaming.

This proof of concept was initiated by the EBU, which strongly supports the development of MPEG-DASH as it is a key enabler allowing broadcasters to use a single file and streaming format to deliver content to multiple devices on multiple platforms. The demonstration featured a live video stream encoded using the MPEG-DASH ISO Base Media File Format Live Profile, delivered through a Content Delivery Network to a range of devices including tablets, smartphones and PCs running iOS, Android and Windows operating systems. This represents the first large-scale multivendor deployment of MPEG-DASH. The demonstration is based on an early version of the DASH-264 interoperability guidelines, specifically developed by the DASH Promoters Group for interoperable deployment of the MPEG-DASH standard. DASH-264 provides a general interoperability framework aligned with the HbbTV 1.5 specification and other consortia recommendations. HbbTV 1.5 will be widely used by European broadcasters for interactive services on connected televisions.

(EBU)

iPlayer adds Restart

The BBC iPlayer is to add restart functionality on its PC version, meaning viewers can watch a show from the start, without waiting for a show to end. Viewers will be able to watch BBC shows from the beginning or rewind the entire schedule by two hours. A popular feature on cable networks, restart has to date remained absent from Europe, with the exception of a few. The move has been aided by a move to http streaming.

It builds on iPlayer's strategy of moving beyond catch-up and makes watching live content even better online. With live requests making up over 22% of total BBC iPlayer requests on the PC, the BBC is seeing significant growth in demand for live content on the iPlayer.

(Broadband TVNews)

Miscellany

High Throughput on KU Transponder

Satellite transmission specialist Newtec, has broken bandwidth efficiency records using the DVB-S2 standard, by achieving 0.5 Gbps two-way throughput over a 72 MHz Ku transponder. This new milestone would pave the way to send and receive more programming, faster, than ever and to gain greater efficiency, increased performance and expanded market reach.

Tests were performed during the night in order not to disturb on-going live sports transmissions during daytime hours. Cloud-cover conditions were taken into account to ensure the tests were relevant for real-world broadcast and telecom situations. The tests were carried out in several steps to validate different market application scenarios. A number of elements were used to improve overall efficiencies, including the use of Clean Channel Technology, a Newtec system for implementing the lowest roll-off and filtering to boost throughput. New modulation and Forward Error Correction (FEC) codes were also used. Completely reworked 32 APSK 135/180 (135 over 180) modulation proved to be optimum.

(Broadcast Engineering)

Leading TV Makers Launch Smart TV Alliance

Founding members LG Electronics and TP Vision (for Philips TVs) have officially established the "Smart TV Alliance" with other TV manufacturers in the process of joining. The Alliance forms a cooperation that aims at enhancing the Smart TV experience by creating a non-proprietary ecosystem for application developers to create attractive, platform-independent services.

To make it easy for new partners to join in this effort and to facilitate effective discussions, the founding Smart TV makers have established Smart TV Alliance Consortium. One of the primary objectives of this consortium is to help define technical specifications which will enable application developers to create their applications once and run them on multiple TVs regardless of the platform.

Smart TV Alliance is designed to benefit all participating members, TV makers, applications developers and content providers alike, and welcomes any interested organisations to join. The latest information about its activities and plans can be found on the official webpage including membership, SDK and plans for developer forums.

(Digital TV News)

Broadcast Production Comes to the Cloud

A new cloud-based system for managing television and film projects, Scenios, is now offering a free version of its producing platform that includes five gigabits of cloud-based storage and unlimited users for a single production. The platform allows producers to share real-time production information between different physical locations. The process begins with a script, either uploaded or written in a web browser. A shooting schedule is built online and automated call sheets are created. These can be distributed instantly to an entire production team over the Internet.

The same can be done with a production budget, which can be restricted to certain users in the overall group. Professional-quality high-definition video files can also be shared with logs of shots. These can be reviewed within the same web browser. The platform allows online videoconferences and production meetings to be set-up between ten people at various locations. The production platform works on Macs and PC, and on Apple's iPads and iPhones for those on location.

(Broadcast Engineering)

Dual-View Technology Showcased

Television screens incorporating "Dual-View" technology have been demonstrated by Samsung at a trade show. The technology enables two viewers to watch two different programs on the same screen, using technology which, analogous to active 3D technology, alternates two programming streams at high frame rates (120 Hz in this case) and synchronizes with a pair of shutter glasses. These shutter glasses can then be used to toggle between the two video streams, in addition to containing a small built-in speaker for separate audio. It has not yet been announced when the "Dual-View" TVs will be available to consumers.

(Screen Digest)

Football Fans also Turning to Tablets

Football fans are turning to second screens while watching their teams on TV, according to a new research study. The research found that while TV remains the preferred viewing device to watch a tournament, more than half (54%) use another digital device whilst watching. Social networking and mobile devices are also playing a key role in keeping fans up to date and building excitement around a tournament.

Fans' use of multiple devices to watch matches remains high with the use of tablets increasing significantly: one in ten who used an additional device whilst watching games on TV used a tablet. Smartphones took the top spot with 28% of respondents favouring this as their second-screen device alongside the TV set.

(Broadband TV News)

Equipment Trends

Cameras & Accessories

New 4k Cameras

The F65 camera has been built with a Sony Super 35 8k image sensor. The sensor has about 20 total megapixels (about 18.7 million active) and is the first to offer a dedicated green photosite for every pixel in the 4k output image.



New 4k cameras from three different companies

The F65 can operate at up to 120fps, and has more exposure latitude, dynamic range. It outputs 16-bit Linear Raw files directly to SR Memory cards on its on-board SR-R4 memory recorder for a streamlined shoot-to-screen 4k file-based mastering workflow. The camera can also provide exquisite images of super-sampling 1080p HD. Super-sampling gives the ability to de-mosaic adjust two ray scales, color correct, composite and even re-frame the image in post. The camera is designed to work with the docking SR-R4 SR Master field recorder, which captures work to solid-state SR Memory cards for versatile file-based recording. It is part of a production system that includes field recorders, studio decks and a transfer station. Other features include virtually and visually lossless recording at 440Mbps and 880Mbps plus space-saving 220Mbps SR Lite.

Panasonic's 4k Varicam concept camera with a cinema-sized sensor, most likely a Super 35 over the Micro Four Thirds format, records to AVC-Ultra 4k 4:4:4. It has four XLR inputs, SDI outputs and capacity to add plenty of attachments.

Canon is developing two professional 4k-resolution digital movie cameras for its Cinema EOS System. These include the Cinema EOS C500, which is designed to use EF-mount lenses, and the Cinema EOS C500 PL for use with PL-mount lenses. The two camcorders will provide uncompressed Raw output for external recording.

Both cameras allow recording at 4k or full HD 1920x1080 pixels resolution at 24fps to 60fps, and feature an 18.1 megapixel 24x36mm Canon CMOS sensor. When switched to a 10-bit YcrCb 422 mode, it can jump to 120fps.

In recent months, Panasonic has launched two new camcorders with deliveries of the AG-3DPI, an integrated twin-lens, 3D shoulder-mount camcorder with 1920x1080 resolution. It includes a two-lens zoom and high sensitivity sensors. JVC also recently began delivery of the HDC-Z10000 compact, twin-lens 2D/3D professional handheld camcorder. It is fully compatible with the AVCHD 3D/Progressive standard.

(Asia-Pacific Broadcasting)

Multi-format Production Camera

The SK-HD1200 is Hitachi's fourth-generation HDTV camera that employs the latest advanced progressive scan CCD image sensors, advanced digital signal-processing patents and the company's proprietary technology, to lay claim to the position of being one of the 'greenest' and most power-efficient cameras on the market.

As a standard feature, the lightweight (4.4kg) SK-HD1200 is a multi-format output camera system as it is able to output dual formats (SD and HD) at the same time. Also available as a standard feature is its ability to output 1080p, 1080i or 720p HDTV signal formats and SD.

(Asia Pacific Broadcasting)

Camcorder for Difficult Lighting

The PMW-200 equipped with three 1/2-inch Exmor CMOS sensors and full HD 4:2:2 50Mbps recording has been introduced by Sony. The new PMW-200 range of handheld camcorders inherits the versatility of the PMW-EX1R which has been a worthy shooting companion for a whole range of different productions. The 1/2-inch type sensors allow the camcorder to perform exceptionally well even in challenging lighting conditions.

The 4:2:2 50Mbps device utilises three 1/2-inch type sensors providing a high image quality of full-HD resolution, a wider angle of view and excellent sensitivity that captures greater details in both low light and bright environments. In addition, a variety of recording formats such as MXF 50Mbps/35Mbps, MP4 35Mbps/25Mbps and DVCAM are available for a wide range of applications and workflow.

The camera also offers a powerful Slow & Quick motion function which enables capture at 1 fps to 60 fps in 720p mode, and from 1 fps to 30 fps in 1080p mode. Furthermore, the images can be played back immediately after shooting without using any converters or processing on non-linear editing systems, letting users enjoy convenience and time-saving benefits.

The PMW-200 comes armed with a 14x zoom lens and offers full manual operation for wide creative functionality. The supplied lens is equipped with 3 independent rings for zoom, focus and iris adjustment, plus greater precision of settings through indications of ring positions on the LCD screen. To better meet operational needs, the camcorder also features an in-built ND filter wheel (1: Clear, 2: 1/8ND, 3: 1/64ND). Focusing on subjects and reviewing recorded footage is made easy with the full-color 3.5-inch WVGA (852x480) LCD panel.

(www.sony-asia.com)

New LED Lights

The Sola 4 daylight balanced LED Fresnel light, the Croma variable color-temperature LED lighting fixture, and the Inca Series tungsten balanced LED Fresnel fixtures have been introduced by Litepanels.

The new Sola 4 joins the company's larger Sola 6 and on-camera Sola ENG LED Fresnel fixtures. Said to be the smallest DMX controllable LED daylight Fresnel fixture, the lightweight Sola 4 (3.60 pounds) is designed for backlight and accent lighting, in studio or on location.



Daylight balanced LED Fresnel light

The Croma, in addition to soft light, also provides color temperature output ranging from daylight to tungsten. It is a versatile solution for run-and-gun news shooters, event videographers or still photographers from one shot to the next, with little time to change lighting equipment or add gels.

(*Asia-Pacific Broadcasting*)

Production Equipment

Subtitling Solutions

New subtitling and closed captioning products announced by Softel enable the creation, repurposing, encoding, transcoding, insertion and transmission of subtitles and closed captions in a wide array of file formats. These solutions have been optimised for next-generation workflows, for anyone transiting to tapeless, upgrading to HD, exploring multi-platform delivery, rolling out multi-language feeds or focusing on 3D.

The company has also introduced solutions for ancillary data processing, video description and Teletext. These are, Swift Create subtitling and captioning workstation, which allows the preparation and repurposing of subtitles and captions supporting all formats of open, closed and DVD/Blu-ray subtitles



Multi-language and multi-platform subtitling and closed captioning software

and captions. The device enables broadcasters to encode and repurpose file-based subtitle content regardless of file format and allows users to switch easily between SD and HD formats to facilitate multi-platform and worldwide distribution.

(*Asia-Pacific Broadcasting*)

Desktop Remote System

The Touchmix Pilot Desktop Remote system, which consists of a new Desktop Remote panel with rack-mount host unit has been introduced by TSL Professional Products. The device provides one-touch access to any analogue or digital audio source material in mono, stereo or surround; allows for the adjustment of levels and balance; and delivers the capability to mix together multiple sources. Designed to help broadcasters empower creative operators with a more flexible and convenient control platform, it is a complete solution for lean-back audio monitoring.



New Desktop Remote panel

By using the Touchmix Pilot, directors, producers, editors and VT operators will have straightforward access to multiple audio sources, literally at their fingertips. Designed with the latest touch-screen technology, the intuitive user interface allows operators to tap the audio channel they wish to hear, mix together incoming sources and even adjust individual level and balance. It comprises a pair of 20-channel audio mixers with exclusive signal selection via the on-board router and a 'solo' monitoring buss function similar to that of a large-format digital audio mixing console. Up to 64 audio inputs can be chosen simultaneously from AES and analogue sources.

(*Broadcast Engineering*)

Metadata Generation System Comes to the Cloud

The new version of Guide-Builder metadata system leverages a Web-based GUI (graphical user interface), centralised control and management capabilities, and a new network-based PSIP (Programme and System Information Protocol) carousel download service to provide broadcasters with a "low-maintenance, cost-effective" method for generating the required PSIP elements of ATSC.

The turnkey solution handles listing inputs for both legacy ATSC and ATSC M/H, enabling users to deliver accurate PSIP data for DTV services on TV sets and mobile DIV-enabled PCs, smart-phones and tablet devices all from a single unified platform.

The new network-based PSIP carousel download service can be integrated with MPEG-2 encoders and multiplexers to create a seamless installation without interrupting daily operations. Broadcasters can import programme data from a wide variety of traffic systems, and through a Web-based interface, multiple users can simultaneously access and manage programme event information – stored on a virtual cloud – from remote locations.

(Asia-Pacific Broadcasting)

HD Encoder and Switcher

The ViBE CP6000, a new high-performance contribution platform and the ViBE EM4000, a powerful new multichannel HD encoder have been launched by Thomson Video Networks. With the product's modular implementation of the optimal MPEG-4 contribution codecs, eight HD channels per 1RU chassis and industry-leading compression performance, the ViBE CP6000 is a substantial advance for contribution applications. Also the recently launched Amethyst III IP switcher has IP inputs and outputs in addition to ASI interfaces. The new-generation switcher provides fast, and seamless switching between multiple 1+1 MPEG transport streams transported over IP networks.

(Asia-Pacific Broadcasting)

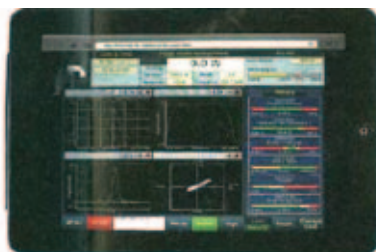
Miscellany

A Boost for Glasses-free 3D

Dolby 3D, a 3D HD format and suite of technologies has been designed by Dolby Laboratories and Royal Philips Electronics to deliver full HD 3D content to 3D-enabled devices, including glasses-free displays. The device also improves the 3D viewing experience on displays of all sizes including smart phones, tablets, PCs and TV sets, and delivers clear glasses-free 3D content over existing distribution systems.

(Asia-Pacific Broadcasting)

Advanced User Interface and Mobile Applications



Advanced User Interface for monitoring and control

Advanced User Interface (AUI) is a portal to the control and instrumentation capabilities that are included in Nautel NX, NV and VS series transmitters. It provides comprehensive monitoring and control (down to submodule level) an industry grade spectrum analyzer, extensive logging of events, tolerance and alarm monitoring and HD Radio constellation view and more, which local touchscreen and remote access.

The AUI is a web server which can be accessed from any location with internet access and may be operated via smart phone, tablets or computers. The AUI may now be accessed from any browser-capable smartphone or tablet.

Users of older transmitter aren't left out when it comes to remote access. The optimal NXLink adds IP-based access to V series (FM), XR series (AM) and J1000 (AM) transmitters for fast and easy remote monitoring and control from virtually anywhere. Users can access status, controls, alarms, logs and reports via smartphones or any Internet-connected browser. NXLink can be configured for use with single or multiple users; up to eight configurable information pages are available for each device and each information page can display up to 16 channels of equipment data.

(www.nautel.com)

Mobile App Helps Reporters

The new mobile app of Digigram Iqoya makes an iPhone into a professional-grade contribution tool for creating a full-duplex connection between a reporter in the field and newsroom or studio.

The application transforms an iPhone into a high-quality MPEG 2 layer and AAC record/editor and mobile IP codec. With this app, journalists can record and edit audio and send it to the studio either live over IP or through FTP file transfer. All that is needed is 3G Internet connection or Wi-Fi access. When used to connect to a studio equipped with 100 percent software code, broadcasters can take advantage of end to end software solution.

Q-Mic, an optional Digigram – engineered mic preamp extension (to be plugged into the iPhone headphone/mic jack) allows journalists to use their preferred microphones during interviews. Compatible with all iPhone and iPad models, the mobile application is easy to set up and is targeted at radio or web journalists operating with an emphasis on mobility.

(www.digigram.com)

Mics for Mobile Journalism

The i-Series professional microphones from MicW are designed for iOS devices such as iPad, iPhone and i-Pod touch but can also be used with other mobile devices. Suitable for mobile journalism, the i-Series allows broadcasters to carry out live broadcast and more with their smartphones.

This range includes the i436 professional Class 2 mic for measurement and recording; the i456 cardioid general-purpose mic; the i266 high sensitivity cardioid mic for high-quality recording; the i825 omni lavalier mic and the i855 cardioid lavalier mic for the recording of interviews HD video production and ENG.

The company also announced the new L-Series professional lavalier microphones, featuring small size and EM protection the company says the L-series mics deliver a warm, clear sound and are appropriate for applications such as broadcasting, ENG, conferences and stage work. The firm also released the M series professional measurement mic, which is compliant with IEC 61094 and IEC 61672 sound level meter standards.

(Radio World)

Personalities & Post

New ABU TLOs



Shree Bhadra Wagle
Radio Nepal

Shree Bhadra Wagle received a BE degree in Electrical & Electronics Engineering in 1992. He later joined Radio Nepal and worked in different capacities in engineering. Mr Wagle has contributed papers to ITU-D Study Groups on, "Migration from analogue to digital broadcasting" and "Convergence of telecom, broadcasting and computer technologies".

Dr Sang Jin Lee
Seoul Broadcasting System

Dr Sang Jin Lee received the B.S., M.S. and Ph.D. degrees in electrical engineering from Yonsei University, Seoul. He is SBS's deputy chief engineer in the broadcast technology planning team. His research interests are signal processing in multicarrier systems, digital broadcasting systems such as 3DTV and UHDTV, and mobile broadcasting systems.



Kamaludin Malik
AORA TV



Mr Malik has 15 years experience in TV broadcasting. Most recently he worked in the digital transmission, satellite and fibre optic areas. He has experience in DTH, high power VHF and UHF RF transmission system and microwave communication.

R K Sinha
New Engineer-in-Chief for DDI-India

R K Sinha has been appointed Engineer-in-Chief of Doordarshan (DDI), India's national television service. Mr Sinha, who took up the position in July, has also become a member of the ABU Technical Bureau and DDI's ABU Technical Liaison Officer.



As E-in-C he is responsible for the overall management of DDI's entire TV network across the country. Mr Sinha has over 36 years' experience in radio and TV broadcasting.

David Wood steps down at EBU



David Wood has retired as the European Broadcasting Union's Deputy Director Technology & Development after almost 32 years of service. Mr Wood, who retired at the end of June, remains a consultant to the EBU and will continue to be active in inter-union activities. David Wood

has played a significant role in standard setting at the ITU, spanning many years. Currently he chairs the WBU-TC. His contribution to the broadcasting industry is immeasurable.

Richard 'Dick' Butler former ITU Secretary-General passes away

Richard 'Dick' Butler, former Secretary-General of the Geneva-based UN agency, the International Telecommunications Union (ITU), passed away in Melbourne in June last.



Mr Butler was the first Australian in the UN hierarchy and, in 1982, the first to be elected as Secretary General of a UN agency. He held the position from 1982 to 1988. He was acknowledged as a pioneer in bringing the computer and telecommunications communities together. In much the same way, he foresaw the convergence of the information industry and the broadcasting community.

Mr Butler was widely respected for his humility, his deep understanding of the issues and his diplomacy and consensus building skills. His dream was to bring affordable communication systems into the rural communities and he dedicated his professional life to this goal.

Mr Butler later served as Chairman of WorldSpace Asia and remained active in the ITU and the ABU, promoting radio broadcasting by satellite and other radiocommunications services.

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Tapping into a P2 cam

Evolving Your Workflow — P2 cam Wireless Solution



A wireless network connection helps to use metadata effectively in video production. When installed with the new optional AJ-WM30 Wireless Module and AJ-SU31000 Upgrade Software Key, the AJ-HPX3100 gains wireless LAN connectivity*. The following three functions can be used with PCs/Macs, smartphones* and portable media players**.

The AJ-HPX3100 has a built-in web application to allow remote operation from a WWW browser, without using special software.

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



AJ-HPX3100 Memory Card Camera Recorder "P2 cam"

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

*1: Connection of up to three units is possible in ad-hoc mode only. *2: Playback of proxy data requires the P2 Browser software. *3: Proxy data can be saved on a PC/Mac. *4: Proxy data can be saved only in PCs/Macs. *5: For the latest information, see "Support & Download" on the Panasonic website (<http://pro-av.panasonic.net/>).

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

*Mac, iPad, iPhone and iPod touch are trademarks of Apple Inc., registered in the U.S. and other countries.