IBC 2007

— a glimpse into our technology future

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The fortieth edition of IBC 2007 broke records, yet again. There were some 47,000 visitors and 1300 exhibitors from a total of 120 countries. There was plenty of innovation on display, even though some visitors thought it was a show about consolidation.

Here, Nick Radlo points to some of the technology advances, new products and cross-industry initiatives he thinks it's worth keeping an eye on.

HDTV was everywhere at IBC – some were worried about how they would now find standard-definition-only equipment.

Dr Takashi Fujio *(left)* **and the new EBU Technical Director, Lieven Vermaele, at the presentation ceremony in Amsterdam**

HD saw another anniversary celebrated this year – 25 years since HDTV was first demonstrated at an EBU general assembly in Killarney, Ireland. The NHK research engineer who pioneered HDTV in the 1970s, Dr Takashi Fujio, was at IBC to receive an honorary life membership of the EBU Technical Assembly, from the new technical director of the EBU, Lieven Vermaele.

Dr Fujio gave a presentation at a special conference session on 25 years of HD, at which he explained the development by NHK of **UltraHDTV**.

Last year, NHK showed its prototype 8k UltraHDTV system at IBC, complete with 22-channel surround sound. This year comes the news that NHK has put the UltraHDTV format forward to SMPTE to begin the process of defining UltraHDTV as a standard. It's still a long way off becoming a saleable reality, but the possibility of UltraHD is now the subject of serious discussion, and NHK Labs expressed the hope at IBC that European research centres will be able to collaborate on UltraHDTV development, which still has many years to run.

An ad-hoc film crew from the EBU's Technical Department prepares to interview Dr Takashi Fujio

Three generations of EBU Technical Directors at IBC 2007. *From the left:*
George T. Waters (1986 - 1997)
Phil Laven (1997 - 2007)
Lieven Vermaele (2007 - ?)

NHK – high-speed video camera

NHK exhibited at IBC again this year, in the New Technology Campus, where it showed a prototype high-speed video camera, that can record at up to one million frames a second. This extraordinary advance has been made possible by engineering the CCD to have memory. So each pixel has its own memory, which removes delays in processing and allows the camera to shoot at such high speeds. Live demonstrations were given on the NHK booth of the camera recording a water-filled balloon being burst, then re-playing it instantly as it explodes in ultra-slow motion. This convinced many that an exciting new tool has arrived.

Nature programming in particular could benefit, and has already in Japan, as another clip shown on the stand demonstrated, with pictures of an amphibian as it ran very fast across water, captured by the high-speed camera to show every detail of its remarkable progress in running on water.

Hitachi and Dalsa have contributed to the development of this high-speed camera. Currently, only two exist but a production model is expected from Hitachi next year.

Solid-state recording for HDTV acquisition

Another shift in strategy saw Sony's first venture into solid-state recording for HDTV acquisition – the XDCAM EX-1 camera. This was shown behind a glass case at NAB, but it was a product on show at IBC and is due to ship in November this year. This new camera, the PMW-EX1, has a new 1/2-inch Exmor CMOS sensor and uses newly-developed flash memory cards, the SxS PRO, to record up to 100 minutes of HD footage at 35 Mbit/s or 140 minutes at 25 Mbit/s using two 16-GB SxS memory cards. First impressions of the new camera were favourable ... for at least one big broadcast user of HDV cameras, the EX-1 could fit as a replacement for Sony's Z1, with the opinion expressed that Sony had listened to the criticisms of the Z1 and had rectified them on the EX-1.

LCD reference monitors

Sony had a good show, winning a hat-trick of awards for its activities at IBC – best large stand, best IBC conference paper with *"Sports Content Creation With Intelligent Image Processing"* from Sony Research Labs. The IABM Peter Wayne Award also went to Sony for its development of the BVM-L23 LCD master monitor.

This 23-inch LCD monitor was seen as the best attempt so far to get an LCD replacement for the rapidly disappearing CRT reference monitors which the broadcast industry has grown up with.

There was at least one conference session which addressed this problem of how to replace CRTs for professional monitoring of picture standards, and EBU and SMPTE working groups are co-operating to define exactly what is needed, for the display manufacturers to work to. The concept of the "virtual VTR" to lay down a benchmark for what is needed from flat-screen displays was gaining wider acceptance at IBC.

3D Cinema

Red Digital Cinema delivered the first 25 production models of its Red One 4k camera just before IBC, and visitors to the show actually got to handle the camera for the first time.

Stereoscopic 3D film and video made an impact at IBC, with conference papers and a series of spectacular screenings in the RAI auditorium, culminating with U2 in concert, in 3D.

Some of the orders for Red's camera are in fact destined for stereo 3D production, and that's also true for Sony's highest specification camera, the F23, designed for digital cinematography. A quarter of the F23s sold so far have been sold for stereo 3D production, including six to PaceHD, whose director Vince Pace was on hand when Quantel launched its 3D line-up of products at IBC.

According to Mr Pace, the big difference now that Quantel is to supply its editing, compositing and graphics systems to work in 3D, is that post-production can use native files, and you see work as it's done, without waiting for it to render.

Quantel became the first big post-production supplier to announce a range of real-time stereo 3D post-production products to service the new medium. Quantel reckons post-production of stereoscopic 3D is in its infancy, but growing rapidly, and its new tools allow true WYSIWYG methods of working for the first time in 3D.

Quantel has been having a good year with its other products too; the company has received £30 million in orders for its broadcast systems since NAB in April – *"That's one system installed a week"* said Quantel's broadcast systems manager Trevor Francis at IBC, *"It's our fullest order book for seven years"*.

TV by IT

Panasonic were back at IBC, although in a different form. As Jaume Rey, the European head of Panasonic Professional and Business IT Systems pointed out, *"We're back, but not as an exhibitor – we're showing technology but not products"* he said.

Mr Rey explained what Panasonic had done with the money it saved by not exhibiting at IBC in 2006. It paid for Panasonic's "TV by IT" tour around Europe, which was seen by 83 broadcasters in 26 countries – a total of 4,500 people saw the presentations – to broadcasters, dealers and colleges.

"TV by IT Two this year will be even bigger, with over 200 visits planned" said Jaume Rey. Panasonic is to invest half a million euros in funding "TV by IT" training schemes at 30 certified media schools in Europe, which will be given Panasonic P2 equipment.

Although Sony has now launched itself into solid-state recording, Panasonic remains the pioneer with its P2 cards, and is claiming that nearly 80 percent of European broadcasters who deploy full IT production methods now use P2-based products. Mr Rey also claimed the cost of P2 storage media has halved in the last two years, with a new 32 GB card due out in December, priced at 1200 euros.

Even though the EU has just dropped its anti-dumping levy against non-EU studio cameras, Mr Rey said Panasonic had no plans to resume the sale of studio cameras in Europe. *"The elimination of anti dumping duties is not enough for us to introduce studio cameras in Europe – we think it's unfair*

the huge amount of time and resources we had to spend on this case, but it's good that Europe now has a free market" he said.

Mobile TV

Mobile TV was again much in evidence at IBC, with over 130 exhibits in the Mobile Zone. There was disappointment amongst mobile enthusiasts that the BT Movio/Virgin Media mobile TV service over DAB frequencies in the UK closed in August. It follows the closure of the Modeo mobile TV service (DVB-H) in the US. However, mobile TV remains very much one of the key targets for those who believe TV distribution must employ multi-platform strategies in future, if it is to prosper.

European collaborative projects, funded in part by the European Commission, are exploring many aspects of new platforms for audiovisual content, and one particular project on show in the New Technology Campus extended what people will be able to do with mobile TV on cell phones.

PorTIVity, short for portable interactivity, marries the functionality of mobile TV, as broadcast using DVB-H, with the interactivity allowed by mobile broadband systems such as UMTS. In effect, this brings a sophisticated version of the "red button" to mobile TV – the mobile phone being an environment where red button activity might really thrive. Portugal Telecom, the IRT, Fraunhofer, RBB and Optibase are amongst ten partners in this venture.

Content delivery

Much of the IBC conference was of course looking to the future of content delivery, and in one session, Motorola senior marketing director Marty Stein explained Motorola's take on how the multi-platform era will develop.

He said content suppliers will have to follow the consumer as he moved around his home, and outside the home. Consumers would come to expect their entertainment and information media to follow them around. "Follow Me TV" is what Motorola calls it.

"We'll be shifting content around the home, via 'whole home' media networks, using existing wiring in the home. We'll also be passing content between devices, over IP connections, so a consumer could be watching a show on his main TV at home, then tell the system: 'pause the content, and pick it up later in the bedroom, in the car or on my mobile' " he said.

Richard Cooper, the BBC's controller of digital distribution, explained the BBC's launch into internet TV, with the beginning if its new iPlayer on-demand service, which downloads programmes on request, for seven days after they're broadcast.

He also gave details of two BBC trials that explore further online content initiatives – the BBC Archive project, where viewers order programmes from 1000 hours of back catalogue. The BBC is also trialling a DTT box that has a broadband connection, to leverage the combination of the two distribution methods.

Mr Cooper outlined several issues that could hamper the development of BBC and other online services.

First was the complexity of linking the TV and internet TV devices. *"Linking the TV and PC is not easy yet – multiple boxes are required. In my home, I can use iPlayer on the PC, and through my XBOX 360 I can look at that content on the TV – but unfortunately the right aspect ratio often doesn't make the transition, so I'd make a plea to the manufacturers of such devices to work to ensure consumers have a seamless experience when accessing the same content on different devices – please respect the aspect ratio!"* he said.

He also pointed out that digital rights management issues were far from resolved, although he defended the BBC decision to opt for Microsoft Windows Media DRM. *"It was the only one available when we began formulating iPlayer, but the industry is moving on, and there are new choices now. However, it's still easier to stream securely than to download."*

Richard Cooper also pointed to evidence that although internet bandwidth to the home user was increasing, the sheer amount of traffic meant actual speeds were falling. He added that streaming HDTV remained a considerable challenge. *"We haven't decided how good HD over the Internet has to be to justify calling it 'HD' "* he said.

IT-based workflows

Achieving true interoperability between professional devices in the file-based environment continues to present problems.

The Advanced Media Workflow Association (AMWA) was launched earlier this year, remodelled from the AAF Association, with a wider brief to tackle IT-based workflows in broadcasting, and in particular to find ways of encouraging vendors to implement key file formats such as AAF and MXF, with interoperability in mind. It's what the users want, and DTG UK will host an AMWA MXF Summit on this issue at its new headquarters in London on November 13th.

Another grouping with the aim of sorting out the lack of interoperability between MXF implementations, was launched at IBC. Xchange Technology plans to become a forum for the broadcast and post-production industries, aiming to ensure systems in the new IT-based production world can join up at least as much as they did in the video world of BNC connectors.

Roland Brown, former chief engineer at Moving Picture Company, now president of the BKSTS and chairman of DTG's HD production systems group, is the facilitator for Xchange Technology, and invited users and vendors to join the forum at IBC. The plan is to agree and deliver a common media data-exchange format.

"It is in everyone's interest to contribute and help drive this initiative forward, in a forum where users and manufacturers can come together to discuss the overall production interchange process. It's not viable any more to sell hardware or software which does not exchange data effectively." he said.

EBU/SMPTE Taskforce on timing and synchronization

Much of the technology being deployed today in the new world of IT-based systems was first mooted in the EBU/SMPTE Taskforce on Harmonization of standards, set up ten years ago. Concepts such as metadata first came to the attention of the industry as a result of the Taskforce's work. A new EBU/SMPTE taskforce was announced at IBC, this time to tackle the issues of timing and synchronization in the IT-based production world.

Timecode worked fine with hardware systems, but the increasing interchange between software systems means new methods of timing and synchronization are needed. This working group is to hold its first meeting in New York in November, with its first results expected at the end of 2008.

Explaining the background to the decision to set up the new Taskforce, EBU senior engineer Hans Hoffmann said it covered technical issues that were becoming urgent for the future of the whole audiovisual industry.

"SMPTE timecode was developed many years ago, and is widely used around the world, but it has limitations. It can only count up to 30 frames, but all new high-definition systems will have higher frame rates – for instance 720p and 1080i at 50 or 60 frames, and there are even higher frame rates coming. We need a new way of labelling time in an IT-based environment. A second infrastructure to distribute a reference signal was still based on analogue black burst, and that had to be updated. We have to design a future-proof framework for synchronizing studio infrastructures, not only by coaxial cable, but also how to synchronize production equipment over IT-based lines" he said.

The timescale for the Taskforce work is quite ambitious.

"We'll start by defining the user requirements, and ideas are already coming in for the first meeting in New York in November. We'll then develop a request for technology to be sent to the industry, which will have an opportunity to speak to the Taskforce and formulate proposals. These will be

evaluated against the user requirements, and it's hoped to begin drafting a request for standardization to SMPTE by the middle of 2008" said Dr Hoffmann.

EBU Village

One of the many interesting exhibits in the EBU Village at IBC 2007 showed the work that BBC Research has been doing over the past year to prove the concept of a multiple polarization transmission system for digital TV. Both horizontal and vertical polarizations are used in parallel, on the same frequency, without causing interference to each other.

Called MIMO – for multiple in, multiple out – the system was first mooted in a paper at IBC 2006.

The demonstration at IBC 2007 showed how the BBC's MIMO system could double the capacity in a standard 8 MHz TV channel from 24 Mbit/s to 48 Mbit/s – allowing for three HD channels using H.264 at 15 Mbit/s, plus one SD channel at 3 Mbit/s.

A general view of the EBU Village at IBC 2007

The BBC's MIMO stand in the EBU Village at IBC 2007

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Nick Radlo contributes articles on broadcast technology to a variety of trade magazines, including the RTS Journal "Television", TVB Europe, Broadcast Engineering and Broadcast Engineering News, Australia.