THE PROFESSIONAL'S GUIDE TO MEDIA & ENTERTAINMENT TECH

TVBEUROPE

JULY/AUGUST 2024

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Over to you...

Two words: artificial intelligence. Right now, it feels like AI is the talk of the broadcasting and media industry. From worries about it taking jobs to questions over the ethics of using AI, there is much to discuss and that conversation will continue, I suspect, for some time to come.

When I spoke to IBC CEO Mike Crimp earlier this summer, he said the show will be where we see AI "start to grow up". It's an interesting point. The use of AI is still very much in its infancy. At the moment we're seeing it mostly being used for metadata or even subtitling (more of that herein). It has the potential to transform the industry in ways we don't yet understand, but what is real and what is just smoke and mirrors?

That's why *TVBEurope* has joined forces with *TV Tech* and Caretta Research to launch the first global, industry-wide survey of how artificial intelligence is being used in the broadcast and media industry. If you haven't yet, please take a moment to give us your thoughts. You can find the survey here. We'll reveal the results in the run-up to IBC Show.

"[AI] has the potential to transform the industry in ways we don't yet understand, but what is real and what is just smoke and mirrors?"

Artificial intelligence will be in play at Paris 2024. Olympic Broadcasting Services will be using Generative AI as part of its coverage of the Games. Matthew Corrigan catches up with OBS' chief technology officer Sotiris Salamouris to hear how AI will help tell the story of the Games. It's amazing to think OBS produces more than a year's worth of coverage over the 28 days of the Olympics and Paralympics.

AI is also starting to help broadcasters deliver better sound to viewers, and broadcast sound is the focus of this issue. For our cover feature, Kevin Hilton meets *Doctor Who* re-recording mixer Paul McFadden to find out how he created some of the show's recent standout aural moments. Elsewhere, supervising sound editor Mark P Stoeckinger tells us about his work on this summer's *The Fall Guy*, and Kevin Emmott investigates how Foley is so integral to TV and film.

Away from audio, *Baby Reindeer* cinematographer Krzystof Trojnar reveals how he found light in a dark subject, and we ask, are augmented reality headsets the future of live production? As always, let us know your thoughts. ■

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In this issue

JULY/AUGUST 2024

10

24

36

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Meet the Jünger AIXpressor

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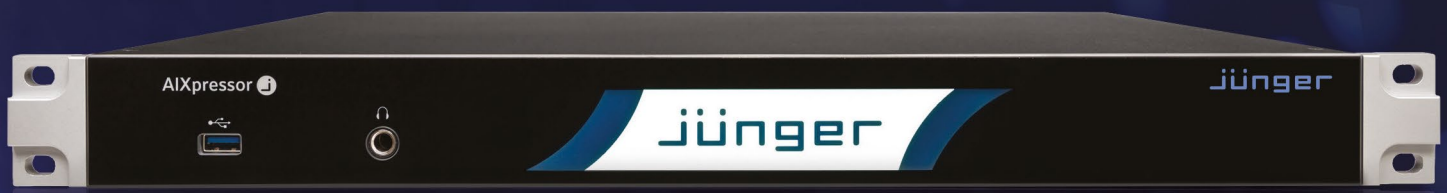

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UltraHD: Delivering the ultimate sports experience

By **Yuriy Reznik**, VP research, Brightcove

Televised sport content is now the norm across the globe – a trend which experienced a significant boom in the last few years. With fans unable to attend in-person events during the pandemic, they relied on streaming their favourite sport content from home. Given the convenience and flexibility of having on-demand access to their favourite teams and sportspeople, many are now more inclined to stream from their own homes rather than attend in-person events.

A 2023 report from Altman Solon found that 57 per cent of global sport enthusiasts are watching more sport now compared to 2020, with the same report revealing that an increasing number of fans are consuming sport via digital platforms and services. All data suggests that the demand for sport broadcasting is increasing, but as this demand continues to increase, so does the need for higher-quality pictures.

Gone are the days of standard or high-definition (480, 576, or 720-lines) videos with Ultra-High Definition (UHD) now providing us with more immersive, visual experiences to give fans that true 'in-game' experience. But what is UHD and why is it better than formats that have gone before?

Understanding UHD

UHD refers to the visual and auditory experiences that go beyond the capabilities and means of traditional HD video delivery. The format offers higher spatial resolutions (2160 lines compared to the usual 1080 or 720 in HD), higher frame rates (up to 120fps v 59.94 in HD), wider colour gamut (BT.2020 vs BT.709), higher dynamic range of pixel values (HDR vs SDR), and higher fidelity of representation of visual content (10- or 12-bits vs 8 in HD) – all resulting in an enhanced media experience.

UHD also provides an improved audio production for audiences, which uses next generation audio (NGA) codecs to transmit audio channels. NGA in UHD doesn't just send mixed signals to speakers like old audio systems. Instead, it sends "audio objects" which are sounds from specific locations on the sound stage. NGA also offers a more immersive experience with configurations like 5.1.4, which includes four overhead speakers. It also includes features like improved dialogue, multiple language options, and detailed metadata (like audio descriptions and effects). These advancements make the listening experience in UHD much richer than with HD.

The case for UHD

With most devices now UHD capable, we expect to see an increase in UHD content. In fact, we are no longer limited to viewing UHD content solely via television, as most regular web browsers and PCs are also starting to adopt the technology to support the resolution.

The opportunities UHD provides are evident – the content is more realistic, vibrant and engaging. The modern UHD screen has the ability to increase and decrease the viewer's feeling of immersion with a 'cinema-like' feel. Bigger TV screens seem somewhat inevitable, but the introduction of UHD will allow most manufacturers to offer even greater diagonal length without deteriorating the overall image quality.

The diversity of capabilities in user devices and plurality of existing UHD colour formats (HDR10, HLG, Dolby Vision, HDR10+, etc.) adds another technical challenge. To deliver the best experience to all devices, the OTT delivery platforms should support several formats (including down-conversion to legacy HD formats) and capability to offer them intelligently by accounting for device capabilities.

Another concern is the variability in internet bandwidth among viewers, which affects the quality of streaming UHD content. Although adaptive bitrate streaming helps, the inconsistency in network performance can still lead to buffering and degraded viewing quality. Consequently, content providers must implement strategies to optimise streaming across different network conditions, leading to increased complexity and costs in content delivery. Addressing these issues is essential for enhancing the overall viewer experience and ensuring accessibility across various platforms.

What next for UHD in the sports arena?

One of the most significant impacts of UHD in sport streaming is the enhanced realism it brings to live broadcasts. With four times the resolution of standard HD, viewers will be able to see intricate details, from the texture of a basketball to the individual blades of grass on a football pitch. Moreover, the integration of HDR (High Dynamic Range) technology with UHD will further elevate the visual experience by delivering richer contrasts and more life-like colours. This combination ensures that fast-paced sports, with their rapid movements and dynamic lighting, are captured with stunning accuracy.

As broadcasters and streaming platforms continue to adopt UHD, the future holds exciting possibilities for sports fans. Innovations such as multi-angle viewing, real-time stats overlays, and interactive features will become more prevalent, further immersing viewers in the sporting events they love. The era of UHD sports streaming is not just on the horizon—it's rapidly becoming the new standard, promising a more vivid and engaging future for sport broadcasting. ■

A different experience

By **Neil Maycock**, strategic business advisor

We've all suffered annoying user interfaces, from consumer products to websites, it can sometimes feel like the designers have never actually tried using their own creations or have no idea what users need.

At this point, I could climb on my soapbox and list example after example, and while potentially cathartic for me I'm not sure it would add much value to anyone else. After a couple of examples, I will explore what is good user interface design, and the return on investment it can bring.

Let's start with those examples, I'm sure we've all encountered websites that are frustrating, 'favourites' of mine are sites that ask you to create a password but don't tell you the criteria for the password until you've failed to meet them, then when you create a password with the newly revealed rules the page is rejected because some other fields on the form were blanked after your first attempt and the password error refreshed the page. Moving to a different consumer sector, a few years ago I had a car which had the ability to play music from an SD card, a very nice feature. However, if I used the search function to find a specific album, after selecting the album the system would then play the tracks in alphabetical order, rather than the order the tracks were on the album. This was only after a search and any other navigation to the album would play the tracks in the correct order. It was as if the software developer responsible had never listened to an album. A very frustrating and permanent feature.

The adage, you never get a second chance to create a first impression, needs to be considered when we look at the user experience. What damage is done to your brand if your customer's initial engagement is frustrating?

Whilst it's easy to list examples of bad user experiences, what does good look like? I think that great user interface design is when it's not obvious. The user experience is intuitive and frictionless, to the extent we're not aware that we're interacting with an elegant and thought-through design. For me, a classic example was the first iPhone. Years ago, when I was a software developer, I spent a lot of time working on early touch screen software applications. It was challenging to make applications easy to use, and it was necessary to invent new conventions when not using a mouse. However, when I first saw an iPhone I had the revelation, that's how we should have done it! From scrolling with ballistics, to pinch zooming, the iPhone introduced conventions that we take for granted today, but from day one consumers could use the phone without a complex instruction manual or training course. That's great design, and although the conventions introduced feel obvious, they weren't, and instead were the culmination of many years of careful and iterated design.

Of course we don't all have the design budgets of Apple to allow us to create the next iPhone, but it's a false economy to not critically test applications and websites through the eyes of your users. Intuitive design makes the application more efficient to use and can reduce the need for training, both tangible commercial benefits for your customer.

Let's take a couple of website examples. It's amazing how many sites don't tag a field requiring an email address with the right metadata to cause a phone to bring up a keyboard with the @ key on it. Let's continue with our website example, if we need someone to enter a date, how about accepting the date in a range of common formats rather than creating an error message when the user types it in anything other than a specific format. Both examples are so simple to do, and in isolation not particularly tangible benefits, but the cumulative effect of focusing on these small things can create a much more overall positive experience.

Today, any discussion on user experiences isn't complete if we don't consider AI. For anyone worried about the dangers of AI taking over the human race, it could be reassuring to try resolving a problem with an online purchase using AI-powered chatbot. Unless your problem is really straightforward, the chatbot experience can be frustrating and ultimately fruitless. Often a straightforward menu of options would be easier and quicker to use than walking through a fake conversation with a bot. Perhaps the real threat from AI is humans losing the will to live when we have to deal with AI personas rather than real people.

As companies increasingly move into the world of subscription and customer retention becomes ever more important, ensuring a positive user experience through products and online services needs to be a focus. ■

Top trends in broadcast audio

By **James Leach**, category head, Sony Europe

Broadcast audio technology has undergone transformative changes in recent years, driven by advances in digital technology, the increasing popularity of streaming services, and the demand for higher audio quality. At Sony we're seeing a number of trends that are shaping the way content is produced, delivered, and consumed, making the broadcast industry more dynamic and adaptive than ever before.

1. Digital audio is the standard

The shift from analogue to digital audio, which began in the early '80s, has been one of the most significant trends. Digital audio offers several advantages over analogue, including improved sound quality, greater flexibility in editing and manipulation, and more robust transmission.

2. Immersive audio formats

Immersive audio formats are revolutionising the listening experience by providing a more three-dimensional sound environment. These formats use object-based audio, allowing sound designers to position audio elements in a three-dimensional space. This enhances the realism and immersion of the audio experience, making it particularly appealing for live sport, concerts, and high-production-value TV shows and movies. Broadcasters are increasingly adopting these formats to differentiate their content and provide a premium listening experience.

3. AI and machine learning

Artificial Intelligence (AI) and machine learning are making significant inroads into broadcast technology, including content creation and audio. These technologies are being used to automate and enhance various aspects of audio production, from sound mixing to noise reduction and audio restoration. AI-driven tools can analyse audio in real time, identifying and isolating unwanted noise, enhancing voice clarity, and even generating background music that matches the tone of the content.

4. Cloud-based audio production

Cloud technology is transforming the way video and audio content is produced and managed. Cloud-based audio production tools enable remote collaboration, allowing producers, engineers, and talent to work together from different locations. This flexibility is particularly valuable in the context of news teams when working with geographically dispersed teams. Additionally, cloud storage and processing capabilities offer scalable solutions for handling large volumes of audio data, making it easier to manage and distribute content across multiple platforms.

5. Advanced microphone and recording technologies

The development of advanced microphone and recording technologies is enhancing the quality and versatility of audio capture. Innovations such as spatial audio or beamforming microphones allow for more precise and immersive audio capture. Beamforming microphones can focus on specific sound sources, reducing background noise and improving clarity, while spatial audio mix allows sound positioning to help create a full 360-degree sound field, providing a more immersive listening experience.

6. Sustainable and green audio technologies

Sustainability is becoming an important consideration in the broadcast industry. Advances in energy-efficient audio equipment and the adoption of green practices in production and transmission are helping to reduce the environmental impact of broadcasting. This includes the use of low-power transmitters, energy-efficient audio processors, and sustainable materials in audio hardware. Broadcasters are also exploring ways to reduce their carbon footprint through virtual events and remote production technologies.

7. Interactivity and user engagement

Interactive audio technologies are enhancing user engagement and creating new opportunities for broadcasters. Features such as personalised audio streams, interactive voice responses, and augmented reality (AR) audio are providing more immersive and engaging experiences for listeners.

These technologies allow audiences to interact with content in real time, providing feedback, selecting preferred audio tracks, and even participating in live broadcasts.

Conclusion

As digital technology continues to evolve, broadcasters must adapt to these trends to stay competitive and meet the changing demands of their audiences. The future of broadcast audio promises to be more immersive, personalised, and sustainable, offering exciting possibilities for both content creators and consumers. ■

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***TVBEurope's* website is a hive of exclusive news, features and information about our industry.** Here are some featured articles from the last month...

BEHIND THE SCENES OF ITN'S PREPARATIONS FOR *ELECTION 2024 LIVE: THE RESULTS*

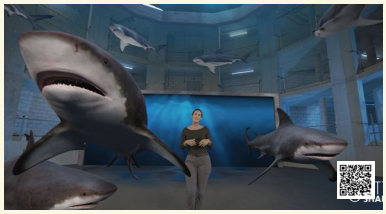
ITN's Jenny King and Jon Roberts discuss the work that went into readying ITV's election night programme, as well as some of the technology that ensured viewers were kept up to date throughout the night.

CAPTURING THE SPECTACLE OF THE WORLD'S BEST-KNOWN MOTOR RACE

Capturing the sights, sounds and sensations of the Le Mans 24 Hour motor race places unique demands on the team behind the TV production. Matthew Corrigan spoke to WBD Eurosport's Will Brooks about the challenges they had to overcome.

HOW TF1 IS EXPLORING AN AI-DRIVEN FUTURE

Olivier Penin, director of innovation at TF1 and Moments Lab's head of science, Yannis Tevissen, outline some of the findings from an ongoing research project into AI in the media.



TAKING A BITE OUT OF THE VFX FOR *SHARK ATTACK 360*

Simon Percy from Little Shadow details how the animation studio used a mobile virtual production setup to create a VFX shark lab for the second season of the Disney+ series.

SES' ASTRA 1P SATELLITE BLASTS OFF FROM FLORIDA

The satellite, which is due to begin operations in 2025, will operate at SES's prime TV neighbourhood at 19.2 degrees East to deliver content for public and private broadcasters, sports organisations and content owners in Europe.

SOUND THROUGH TIME

Doctor Who returned to our screens this spring with a new lead actor, high-end visual effects and a subtle but also often surprising audio design. Kevin Hilton talks to re-recording mixer **Paul McFadden** about some of the season's standout aural moments

Over the 60 years of *Doctor Who* on this and other planets, part of the success of the BBC's flagship science fiction show has come from the use of technology to realise the different worlds and times visited by the central character, the Doctor, and their companions. While the classic era from 1963 to 1989 was often ridiculed - both then and today - for its sometimes poor visual and physical effects, the sound and music more than made up for that.

The original incarnation of *Doctor Who* was the first time many people had ever heard electronically produced music and noises. The now instantly recognisable theme was written by Ron Grainer but arranged by Delia Derbyshire of the BBC Radiophonic Workshop, who created what is revered as a pioneering and now hugely influential piece of electronic music. An orchestral arrangement by composer Murray Gold continues to open most episodes today but a special sound from the early days - that of the Doctor's time and spacecraft, the TARDIS - remains a mainstay of the show.

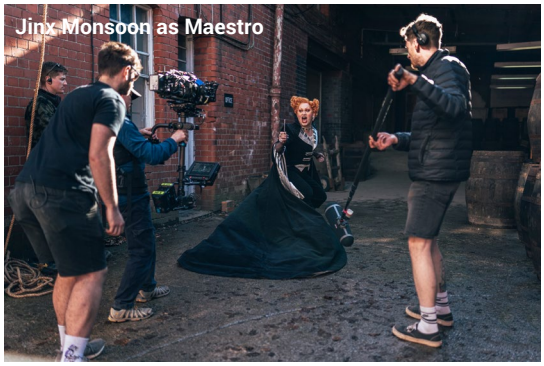
After an unsuccessful attempt to revive the show in 1996, the BBC


The Doctor (Ncuti Gatwa) and Ruby Sunday (Millie Gibson)

finally brought it back to critical and ratings success in 2005, under writer and showrunner Russell T Davies. Following time away working on other projects, Davies is in charge again with a new Doctor, played by Ncuti Gatwa, and a higher budget through Disney Branded Television - now working with the BBC and independent company Bad Wolf - to make the show a global franchise.

This 'Disney money' is most obviously seen in the visual and other on-screen effects but sound still plays an important part. The overall feel of the audio is less in-your-ears electronic but as re-recording mixer Paul McFadden observes, the production continues to use "a fair amount" of material from the Radiophonic Workshop library of generic *Doctor Who* sounds.

The TARDIS sounds are the most consistent example of this but this year's two-part finale - *The Legend of Ruby Sunday* and *Empire of Death* - additionally featured audio from the 1975 classic era serial, *Pyramids of Mars*. The story's villain, Sutekh, was revealed to not only have been behind events that had been dogging the Fifteenth Doctor during his adventures but he was invisibly wrapped around the TARDIS too. "We knew from early on that there was something around the TARDIS and Sutekh was the villain, so we added a few extra metal groans," McFadden comments. "And in the last episode, there's a green laser-like effect that Ncuti gets attacked with, which happens to the Doctor in *Pyramids of Mars*, so we used some of the historical Radiophonic tracks for that."


Jinx Monsoon as Maestro

The sound for *Doctor Who* is post produced in Cardiff at Bang Post Production, which was co-founded by McFadden, who first worked on the series between 2005 and 2010. He is now back managing the sound team and does not think the concept for the audio has changed much. "Having the Disney input has upped the game with bigger budgets for CGI and sets," he acknowledges. "The scale of everything has grown so we've had to up our game as well. But it's always been a high profile, high-energy soundtrack."

Among the new specially created sound effects were those for Sutekh, who is depicted in CGI as a dog-like creature. "I worked with Rob Ireland, our effects editor, partly using sound effects of lions, rhinos and tigers from production libraries along with a vocalisation that I did, with a few growls and screams," McFadden explains. "Then we used the Krotos Dehumaniser monster voice processor and pitch shifting plug-ins on Pro Tools to get some personality, feeling and character in there. It was a performance, which is why Russell calls me Wolfie."

As well as an animalistic side, Sutekh has an urbane but utterly menacing speaking voice. This part was played by actor Gabriel Woolf, who voiced the role in 1975 and is still performing at the age of 91. "We worked with Gabriel years ago on *The Impossible Planet* and *The Satan Pit* [2006], so getting him back was absolutely amazing," McFadden observes. "He went into Bang's studio in London and did a session there and we brought the best takes back here and cut them in. That voice was processed slightly in the final mix to give it a little bit of pitch shifting and delay because Disney wanted a very otherworldly effect. Although most of it was raw Gabriel vocals."

A stand-out audio moment made sound pivotal to the story by, ironically, removing it. In episode two, *The Devil's Chord*, the villain of the week, Maestro, has stolen all music - or at least all good music - from the world. When the Doctor and his companion Ruby Sunday (Millie Gibson) first confront them, the god-like being sucks all sound out of the air.

The effect is disorienting and extremely surprising for mainstream TV. McFadden agrees but says it could have been even more extreme: "We went even further on the first pass and took it out completely. But we put in the minimal amount of tone in there just to prevent any quality control problems. It was a brave thing to do for that amount of time on a television show. It was worth it, though, because it really brought you into what Maestro was about and how the Doctor stopped it."

This relatively short sequence was discussed at executive level as to how far the effect could or should be taken. "We were asking what it would mean for the broadcast, because it could have made people check whether their TV had gone off or not," comments executive producer Joel Collins. "An episode about broken music was always going to be a hard one to score and do sound for."

As Collins observes, sound design can be very misunderstood, with viewers often not knowing it is there or realising the creative efforts behind it. This is especially true in television but with soundtracks on the small screen becoming ever more cinematic, people are appreciating what sound adds to the overall viewing experience. This is something that has always been part of *Doctor Who* and looks as though it is only going to become more important as time goes on. ■

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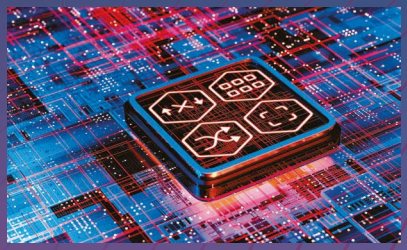

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Innovation, IMPACT, COMMUNITY

IBC CEO **Mike Crimp** talks to *TVBEurope* about plans for this year's show, the rise of artificial intelligence, and how the organisation is helping to find the next generation of talent

What are the key themes of IBC2024, and why have you chosen them?
We have three core themes which form a thread that runs through all aspects of IBC2024, including the IBC Conference, the show floor theatres, new show features and partner initiatives taking place at the RAI. These are Transformative Technology, Shifting Business Models, and People and Purpose.

We've kept these key pillars in place to maintain a structure and help visitors navigate their show experience, with each theme representing a critical focus area for the industry. Transformative technology has always been at the core of IBC and is exemplified by the innovation on display across our exhibition halls and through the IBC Innovation Awards, Technical Papers Programme, and the Accelerator Media Innovation Programme. Similarly, IBC has always championed industry evolution as the media technology sector has had to adapt amid changing consumer behaviours, new ways of working, and challenging economic conditions – making Shifting Business Models an essential theme that impacts every conversation at the show. The People and Purpose pillar is just as pivotal, enabling the entire IBC community to play an active role in positive change, including attracting and retaining the next generation of talent and fostering skills development, improving sustainability, and promoting diversity, equality and inclusion.

This year's show features a brand new AI Tech Zone. Why did you choose to highlight AI in that way?
AI is everywhere in the industry – and indeed the show this year – and is demonstrating hugely exciting potential in media and entertainment. As AI rapidly evolves, and technology pioneers and media companies move beyond the experimentation stages to real-world applications, we are providing a central hub to showcase how AI is impacting our sector's future. We know that media brands and tech providers are looking to step beyond hype cycles and talk about real, proven use cases. The AI Tech Zone is where they can go to understand how to make this happen.

What can attendees expect to see in the AI Tech Zone?
The AI Tech Zone, powered by the EBU (European Broadcasting Union), will act as a focal point for AI providers, content creators and solution vendors showcasing how AI can meet specific industry needs. On the AI Tech Zone Stage, its sponsor, Wasabi Technologies, will lead a session called *Intelligent Cloud Storage: The freedom to accelerate media workflows and create new fan experiences* which will look at how advanced AI algorithms automatically tag content libraries with rich metadata for a range of uses. Then over at the AI Networking Zone, sponsored by DOT Group, the media and entertainment community can connect and engage around AI issues and meet some of the most innovative players championing AI in media.

Tell us more about the AI Media Production Lab, which is a first for IBC. What's it all about and why did you decide to launch it?
Alongside showcasing new products and pioneering AI thought leaders at IBC2024, we want to play an active role in fuelling its development via our hugely successful Accelerator Media Innovation

“IBC2024 is an opportunity for attendees and exhibitors alike to play an active role in redefining the future of media technology, and experience new innovations coming to life"

Programme. The AI Media Production Lab project covers three project streams — Generative AI in Action, AI Audience Validation Assistant, and Changing the Game: Predictive Generative AI — which set out to pioneer new, real-world use cases of AI within media production. The aims include improving creativity in storytelling, deepening audience engagement, and harnessing real-time predictive analytics to personalise live sports viewing. The projects are being powered by world-leading innovators including Verizon, the RAI, ITV, and Vodafone, among many others. All of our Accelerator projects will be showcased at the Accelerator Zone and on the Innovation Stage at IBC2024 – I'd encourage all show visitors to make sure they stop by!

How are new technologies such as AI bringing new exhibitors and attendees to IBC?

Leading-edge innovation across areas such as cloud, AI, 5G, XR, and immersive tech are expanding both IBC's exhibitor and visitor bases, as media and entertainment draws on new and emerging technology segments. Over 150 first-time exhibitors will be in attendance at this year's show. With continued convergence between broadcast and pro AV sectors, we're also hosting a new AV Speed Pitch Event, in partnership with the AV User Group, to enable technology providers to showcase their latest innovations with non-media audiences across retail, finance and other sectors.

The immersive tech space has expanded into two halls this year. How will that be reflected in the Conference programme?

Immersive tech is one of six essential topics covered in the content programme at IBC2024, with Conference sessions from industry leaders including, *How are games impacting the media ecosystem?* and *What does human-machine collaboration mean for the future of content and creativity?* These sessions will cover the evolution of immersive technologies like AR, VR, and metaverse while exploring cutting-edge interactive content experiences of the future.

What are the aims of the Conference this year?

The IBC Conference provides an exclusive deep-dive into the most pressing market issues and trends in media, entertainment, and technology – sharing fresh insights, sparking change, and connecting people. This year, we have a hugely exciting line-up of speakers and key thinkers from major organisations, including Sky, Orange, Virgin Media O2, BBC Studios, WPP, BEIN Media, Olympic Channel, Viaplay, Paramount, and ITV.

Can you tell us about any speakers you think attendees should watch out for?

We have over 325 speakers lined up across an expanded content offering so there really will be a session for everybody. For the IBC Conference, we already have a stellar slate of keynote speakers shaping up. It kicks off with Benedict Evans, the internationally renowned media and technology analyst who has worked with Orange, Channel 4 and NBCUniversal, giving a keynote on *Navigating a Changing Media Landscape*. For visitors who are interested in exploring the world of sports entertainment in this year of huge sporting events, there will be a Conference session called *Olympics 2024: Technology to broadcast beyond expectations* which will look at tech developments that are transforming coverage of the Olympics and raising the bar in live sport production and distribution.

Why are the Accelerator Projects that have been running over the past few months so important to IBC?

Bringing together dynamic media and technology pioneers to address the critical industry challenges of today and tomorrow is at the core of everything IBC stands for. The IBC Accelerator Media Innovation Programme has built huge momentum since its inception in 2019, and we have seen more major media players from around the globe than ever coming to pitch ideas this year. One particularly exciting project within such a major global election year is *Design Your Weapons in the Fight Against Disinformation*, championed by the BBC, CBS News, Associated Press, Channel 4 and Al Jazeera amongst other leading media companies. The project aims to help news organisations address the challenges and abuses of disinformation and misrepresentation in broadcast media — working to establish real-world solutions and effective interventions to combat fake news and strengthen content authentication processes.

The Talent Programme takes place on the Monday of the show. How can IBC help encourage the next generation of media technologists to enter the industry as well as keep those already there?

Fostering new talent and creating an inclusive work culture is critical to our industry. The new IBC Talent Programme aims to examine the benefits of partnerships and mentoring, best practices for promoting the industry to the next generation of media professionals, nurturing talent, and driving engagement with M&E companies. Contributing to the conversation about the development of talent and a more diverse and inclusive industry will be other partner groups, including RISE and RISE Academy, #GALSNGEAR, Women in Immersive Tech, Women in Streaming Media, HBS, SMPTE, RTS and Final Pixel Academy — along with the new Global Media and Entertainment Talent Manifesto's inaugural global flagship event for skills, diversity, and education, the World Skills Café, being held at the RAI on the eve of IBC2024.

What do you hope attendees and exhibitors will take away from IBC2024?

IBC2024 is an opportunity for attendees and exhibitors alike to play an active role in redefining the future of media technology, and experience new innovations coming to life. Business models and consumer trends are evolving at breakneck speed — IBC2024 is the place to be if you want to stay ahead of the curve and seize new opportunities. ■

Please sum up IBC2024 in three words.

Innovation. Impact. Community. ■

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THE WORLD'S LEADING MEDIA AND TECH EVENT

MY IBC

TVBEurope hears from a number of industry stakeholders about the importance of IBC Show, and what they're looking forward to seeing at the event

David Grindle, executive director, SMPTE

IBC is an amazing intersection of the industry in one location. It allows you to connect with both large and small companies, established firms and start-ups. While there is a great deal of business taking place, the atmosphere is very relaxed and congenial which makes it a great place to connect.

This year I'm intrigued by the Accelerator projects and the AI space. The Accelerators have become exciting chances to see new technologies. I've seen several of the projects make their way into the industry in my short time coming to IBC. AI, of course, is a hot topic both in how to use it and how to use it ethically. Hearing folks speak on this will give people much to think about.

Larissa Görner-Meeus, chief technology officer, Proximus Media House

My first IBC was in 2007 with IRT – the Research Institute of the public German-speaking broadcasters. Since that time, I have been every year in roles both on the vendor and the customer side, which makes a total of 17 times this year.

I start by planning the conference sessions I want to participate in and then create my list of vendors I want to see and set up my meetings around the conference slots.

I try to plan them as much in the same hall and location as possible. I remember once walking about 14 km in one day! Secondly, I try to attend several networking opportunities during the show, as I usually find those the most valuable for learning about 'the new things' and potential new smaller ventures in the industry. Lastly, I carve out at least five hours of "strolling time", to have time to pass by the innovation zone and the partner village.

Stephen Stewart, TPN ambassador, UK & EMEA

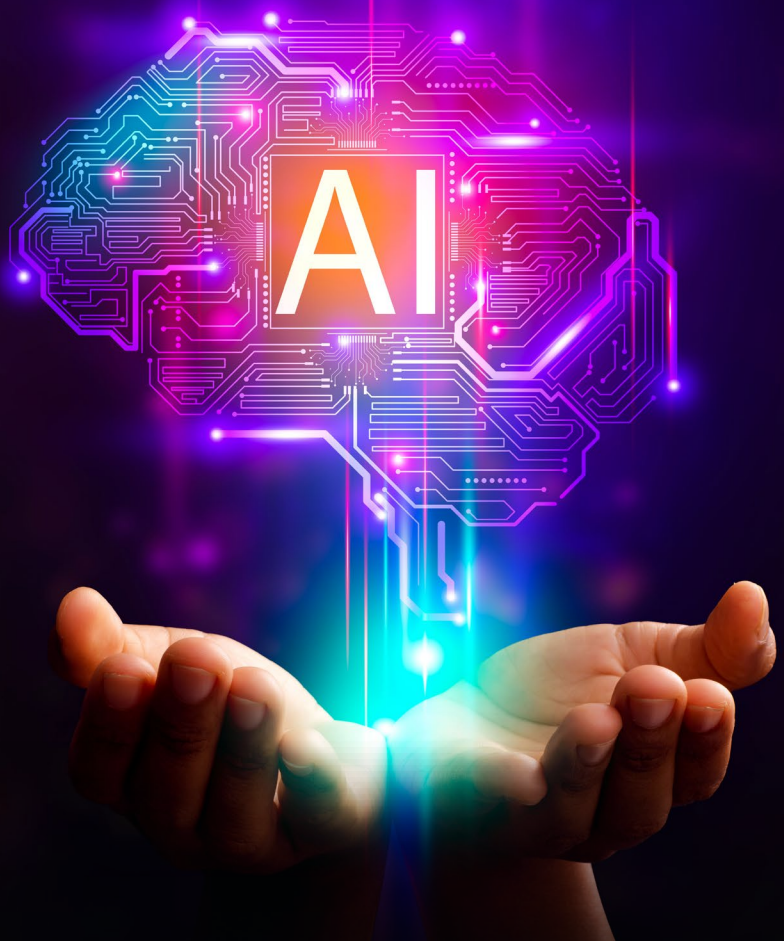
In a professional capacity, it's important to learn and keep up to date with industry trends. Over the years IBC Show has become less about checking out the latest kit and more about understanding how different 'best of breed' software can be connected in a straightforward way to achieve the results or build the workflows needed today and tomorrow.

In my roles for the RTS, IET, TPN and Rise, it's also important to be able to take part in their events, moderate conference sessions, help out on their stands and just be available to anyone who wants to know more about any of those amazing organisations.

I'm looking forward to catching up again with friends and colleagues that I sometimes only see two or three times a year. I'm also looking forward to some exciting announcements from the RTS as well as taking part, as a Champion for the IET, in the IBC Accelerator programme. This year has some game-changing, fascinating projects. I'm also looking forward to some interesting Breakfast Briefings, meetings with contacts at The Beach Bar and the normal spate of client dinners. Oh, and I think someone mentioned that there are 14 halls to investigate too if time allows!

What impact will AI have on the broadcast and media industry?

TVBEurope, **TV Tech** and **Caretta Research** are joining forces on the first global, industry-wide survey of how AI is actually being used in our industry. How are broadcasters and vendors adopting AI, what are the barriers of entry and does the actual adoption live up to the hype?



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CREATING TOTAL *mayhem*

Supervising sound editor **Mark P Stoeckinger** tells *TVBEurope* about his work on this summer's *The Fall Guy*

How did you get started working in sound?

I found myself working in sound through my time at USC Film School. I pursued various interests, but sound stood out to me. I had some TAs that made it seem so exciting and it really lit a fire under me, so I decided to pursue it after graduating.

If you want to go back even further, when I was a kid, long-distance phone calls were expensive, so my family and grandparents recorded our daily lives on reel-to-reel tapes and sent them back and forth. I think that early exposure to the sound of voice inadvertently propelled me to my career in sound.

How did you get involved with *The Fall Guy*?

My story with *The Fall Guy* starts back with *John Wick*. I met David Leitch and Chad Stahelski on that film, and we bonded over our taste in film sound and what sound can do for a film, whether it's helping tell a story or adding a unique element. Since then, I've had the pleasure of working with David on all his films. The genres sometimes differ, so the sound work evolves, and David has become very articulate in expressing what he likes and doesn't like in film sound. Because of our successful collaboration, I was lucky enough to be asked to work on *The Fall Guy*.

Have you worked together with the team before?

There's a bunch of people that I really enjoy working with, and I do everything I can to get those that are available to work on these films when I can. So, yes, there is a team of us. We can't all work on every film together, but I have to say, we're really fortunate in Hollywood. For probably all the crafts, and definitely for sound, which I can speak to, there's a lot of talented people. It's really, really deep. It's always nice to be able to work with a different combination of people on any given film, but there's a pretty deep bench of those who are really creative and excellent when working on David Leitch films such as *The Fall Guy*.

How long did you spend planning the sound for the film?

You know, it's hard to say exactly. You start thinking about the sound from the moment you read the script. Fortunately, I got to read the

The Fall Guy is an homage mixed with a love story, according to Stoeckinger

Photo credit: © Universal Studios

script even before the film was shot because of my relationship with the team, so I knew I would be working on it ahead of time. But I think you really start formulating the sound when you see an image. Since it's such a marriage of sight and sound, as soon as you start seeing some footage, ideas start to come to mind. And that's how the ideas for the sound develop.

This is a film with a LOT of stunts. How big a challenge was that?

The Fall Guy is an homage with a love story, and David's history with stunts really pays off in the film, giving insight into that world. We made it a point to lean into anything David had to say about sound cues that would make the stunts feel real.

For example, the whole opening sequence—from the trailer to the fall—needed a lot of accurate sounds. We focused on details like what it sounds like when you clip someone in and what people say on the walkie-talkie. We even got the first assistant director to help coach us and write lines so that the whole sequence is exactly how it would happen on a set. Elements like these are really important, while the rest is about fun dramatics.

None of the sound was captured on set during the big stunts. How did you go about recreating the sound?

Everything has to be created based on what we want it to sound like and what we imagine it would sound like. For example, with a car roll, you don't get to hear what it sounds like in production because it doesn't get recorded. The goal is to make it sound like total mayhem, but not just a wall of sound. We use individual impacts, elements, and different notes from high-frequency metal to low-frequency booms. All these sounds are added after the fact in action sequences, particularly in this film.

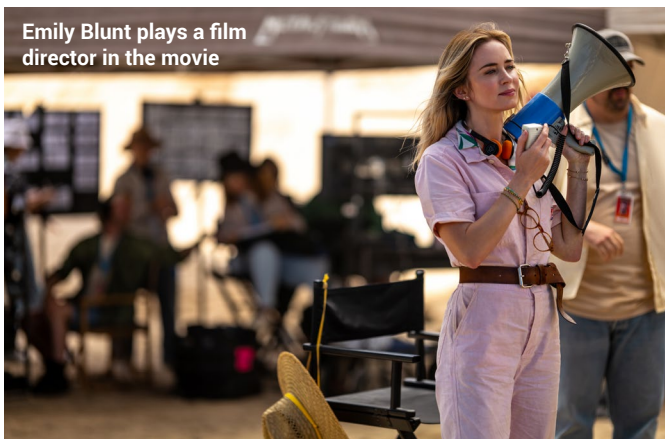
Were you on set at all for the big stunts, just to collect background noise etc?

No, none of us were on set. The production sound mixer might have recorded some background sounds here or there, but I can't verify if any of that was used because their primary focus is on capturing the best-sounding dialogue for the movie. They're not specifically looking for additional sounds, and we didn't have anyone from our team there to record anything. Typically, you don't want to record anything on set because you want to control the environment, and the set isn't ideal for that.

Additionally, on set they might use a motor for a car that isn't what we want it to sound like in the movie. So, even if something is recorded on set, it might not be the sound we want to use. It's better to record these sounds after the fact to ensure they meet the desired quality and interest level for the film.

How did you deal with making sure audiences can hear the actors' dialogue during the big set pieces?

Hats off to Jon Taylor, who mixes the dialogue and music of the movie, and Frank Montaño, who handles the sound effects. They are very cognisant of making the dialogue as clear as possible. This involves maximising production recordings, minimising noise, adjusting the EQ of the sound, and setting the appropriate levels. Dialogue is the leader in the audio mix; it's the level setter around which all other sounds, be it music or sound effects, are built. Making the dialogue clear involves ensuring it remains the focal point in the audio track, with all other sounds supporting it. If needed, the dialogue might be adjusted louder in spots, but ultimately, it's about finding that clarity because the story relies heavily on the words we hear.



Emily Blunt plays a film director in the movie


The sound team wanted to make some of the fight sequences sound larger than life

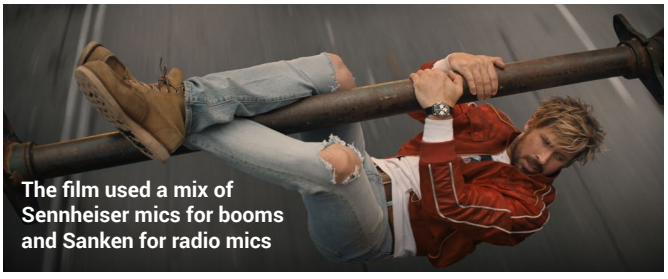
What about the film's quieter sequences, how do you create the sound for those so that it's not jarring when the next shot is a big set piece?

Sometimes you want the transition to be jarring because you want dynamics in your track, with quiet moments leading into loud, big moments. This genre definitely calls for those dynamics, from something quiet to something big and bombastic. But the quiet scenes themselves need texture and detail to feel real. For example, if Colt and Jody are sitting in a car talking on the beach, you'll hear the sounds of the beach, the crew wrapping up for the day, vehicles and trucks leaving, and people packing up. This creates a collage of sounds that make the scene feel real without getting in the way. You'd definitely miss it if it were all turned off. So, while you aim for contrast, the quieter scenes focus on creating a detailed sound collage.

Tell us about the technology used to both create the sound of *The Fall Guy* and edit and mix it for the final film.

On set, we typically use a lot of radio mics due to the wide, multiple-camera shots where a boom mic might not be able to capture the sound effectively. Booms are used as well, but their audio might not always be used in the final mix. For microphones, we often use Sennheiser mics for booms and Sanken mics for radio mics.

In post production, we use Pro Tools extensively. It serves as our medium for recording, editing, and often creating sounds using various plugins. Pro Tools is used throughout the entire process, from recording dialogue and music to sound effects. Music is typically recorded into Pro Tools during scoring sessions, and it's also used for recording ADR (additional dialogue recording). We use databases for sound effects, which we either have or modify for the film. Essentially, Pro Tools is the backbone of our sound editing and mixing process.


The film used a mix of Sennheiser mics for booms and Sanken for radio mics

How did you ensure the sound captured the essence of the original 1980s TV series?

There are two ways the sound captured the essence of the '80s TV series. Firstly, sounds back then were typically obvious, whether by intent or accident, and that's how they were presented. In the fight sequences, for example, the impacts of the hits were made to sound larger than life, more crunchy and slappy, which pays homage to the original. Secondly, there was an opportunity to use the *The Six Million Dollar Man* sound, which was a nod to Lee Majors, who starred in both *The Six Million Dollar Man* and *The Fall Guy*. This was like an inside joke that the studio almost made us take out, but the director liked it, so it stayed in. Visually, there are references all over the film, as well as character names, but sonically, it was about making some of the fight sequences sound larger than life.

Were any sound effects added into the mix that viewers of the movie would be surprised to learn?

Yes, there were some interesting additions. One sound effect that might surprise viewers is *The Six Million Dollar Man* sound, although that's fairly obvious. Another interesting addition was the sound of the stunt car at the end, which was actually recorded for David Leitch's *Hobbs and Shaw*. While this might not be particularly surprising to fans, it was the right sound for the scene, adding intensity and danger.

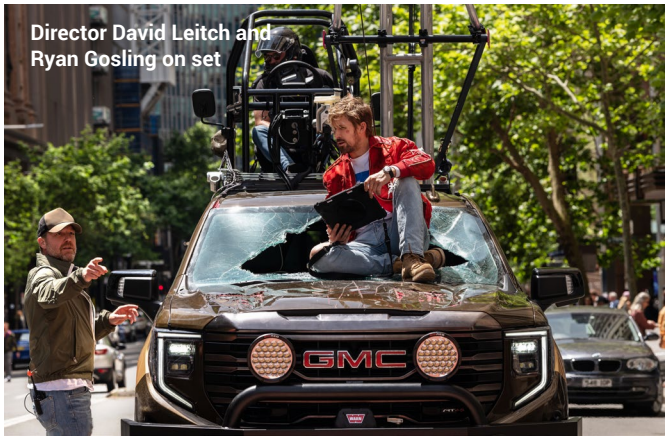
How are effects that are added in post production synchronised with the action sequence - gunshots, for example?

To synchronise effects like gunshots, you start by putting the sound in Pro Tools and finding where the flash of the gun is visually. You

then line up the sound with that action. Typically, a gunshot is made up of several elements, not just one sound. You need high, mid, and low frequencies, as well as other detailed sounds to create a realistic gunshot. These elements are placed in the timeline and synced up.

One aspect that might not be obvious is that if you were to listen to each element separately, they would sound cut up because you want to cut off the tail of the first gunshot before the second one happens. This creates a small gap, almost like a frame, between each sound. If you didn't do this, it would just be a wash of noise without the clarity and detail we're used to hearing in movies.

These techniques go beyond synchronisation and are part of the tricks we use in the editorial process to create sounds that are familiar but different from real life. We're always trying to trick your ears, and these are some of the ways to achieve that.



Director David Leitch and Ryan Gosling on set

How closely did you work with the Foley team?

We worked very closely with the Foley team. Usually, we'd spend a day or so working on some of the really unique sounds in person to get them just right. These are sounds that we'd then integrate into the sound effects, adding detail to the overall sound design. For example, let's say it's a car crash. While we have a large sound library to pull elements from, we might want a sound like a tail light rolling off the car, or a distinct sound for a fight scene. These sounds would stand out over everything else. So, we'd spend a day or so with the Foley team creating these sounds, and that's how closely we'd work with them. For the rest of the sounds, we'd provide detailed notes on what we wanted, and they'd work on them mostly self-directed, with some feedback back and forth along the way.

Other than the stunts, what was the biggest challenge of working on *The Fall Guy*?

The biggest challenge was to never miss having fun with the track and adding nonliteral sounds to maintain its whimsical nature. For example, when Colt takes drinks at the Dundee in the bar and has his out-of-body fight experience, it's about keeping those moments fun, light, and different. Like when he runs out on the street when he's a little high, his shoes squeak almost like a skid when he comes to a stop, playing it that way. Or when we see the unicorn horse, giving it some personality so it's not just a horse there, adding sounds like a breeze or a whinny. We're always looking for opportunities to keep it light and whimsical. David Leitch is very encouraging about leaning into the fun and offering ideas that keep it interesting and realistic, making sure we believe we're on a movie set. The big stunts have to be real sounding, but the more whimsical, broader things in the soundtrack could almost be considered comedic.

What's next for you?

What's next for me is a spin-off of the *John Wick* series *Ballerina*, which takes place between *John Wick 3* and *4*. ■

PHOTOGRAPHING *Baby Rein*

Jenny Priestley meets *Baby Reindeer* cinematographer **Krzystof Trojnar** to hear how he found light in a dark subject

deer

Photo credit: © Netflix

Released in April by Netflix with minimum fanfare, *Baby Reindeer* has become something of a phenomenon. The seven-part drama-thriller follows Donny Dunn who faces a former trauma while also dealing with a female stalker. The show is written by and stars Richard Gadd, alongside Jessica Gunning and Tom Goodman-Hill and is produced by Clerkenwell Films.

Baby Reindeer was shot in two blocks with directors Weronika Tofilska and Josephine Bornebusch handling four and three episodes respectively. The same setup occurred for the cinematography, with Tofilska choosing to work with Krzystof Trojnar, a graduate of the UK's National Film and Television School and Krzysztof Kieslowski Film School in Katowice, Poland.

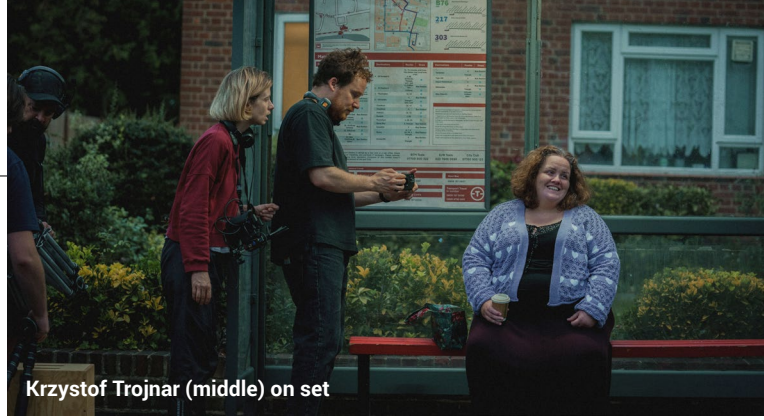
Having previously worked on the second unit for another Netflix series, *1899, Baby Reindeer* marks Trojnar's debut as an episodic TV cinematographer. "Getting that experience on *1899* meant I could start working on other TV projects and I interviewed for *Baby Reindeer*," he explains. "I also studied with the director at film school, but I still had to interview with the rest of the team, Richard Gadd, the creator of the show. The producers had to trust me and I had to convince them."

Creating a bible

Despite it being his episodic debut, Trojnar worked closely with Tofilska to develop the look of the show, holding multiple conversations about the design of the series and how they would achieve it. "We even created what some people call a 'bible' for the show, where we explained our visual approach so that the next team who came in and finished it would continue the look. A new team will do their own interpretation, but you always hope that the basic feeling of the show is there. They took it on and interpreted it in their way."

That prep work took around eight weeks, and while Trojnar admits it was hard to give up the show once his four episodes had been shot, he says working on the final three would have meant committing for a much longer period of time. "For us, it would have meant that we'd have to do double the amount of prep. Most of our prep work included finding the key locations for the show, so there was a lot of research

> "We created what some people call a 'bible' for the show where we explained our visual approach so that the next team who came in and finished it would continue the look"


Krzystof Trojnar (middle) on set

and preparation and conversations in order to prepare the 'bible' of how we saw the show and how we imagined things would be portrayed."

That prep work also included creating a collage of images from films and photographs that suited the creative team's feeling for a particular moment in the story. "There's definitely a shift of tone throughout the series," states Trojnar. "We would bring different references for different parts. There are films that are first-person point-of-view stories where you hear the main character telling their story and I think we did look at some like *Trainspotting* or *Fight Club*, but they are all a little bit tonally different to *Baby Reindeer*. Those titles were mentioned, but it was never a direct reference."

Shifting the tone

Baby Reindeer shifts in tone throughout the series, sometimes more comedic, other times a lot darker. For Trojnar, it was important to include those comedic elements to lift the mood. "There's a moment in episode four where a scene starts with Darrien dancing in front of Donny," he explains. "On paper, it sounds pretty bizarre but in the voiceover, he says you wouldn't imagine that this is how a career in television started for him, and it is somehow funny, but also very dark."

Trojnar adds that the creative team deliberately chose not to brighten up or "smooth out" the show's atmosphere when Donny is going to dark places. "You kind of have to feel how Donny feels at that time. That was the main task for us, to portray the state and the feeling of the main character, and so in that sense, I think we went where the story went."

The series was shot using an ARRI ALEXA Mini LF with ARRI DNA lenses. Trojnar says he and Tofilska spent a lot of time discussing their options and felt that some cameras would give them too much of a hyper-realistic look. "I'm used to ARRI sensors and feel they have a bit more of a painterly quality to them and are not too overly stylised or romanticised," he explains.

"The lenses were perfect because we wanted Donny to be in mostly central positions. We saw the wide shots as helping to enhance the feeling that the character is stuck in his life and he's sort of oppressed by the story that is happening to him. So we wanted him to be set in the centre of the frame. You never see much sky in the show, and you never get that feeling of space. The DNA lenses have a particular feature where they lose the resolution towards the edge of the frame so it was just a perfect combination.


Richard Gadd shooting one of the series' few outside scenes

"There was one shot where we felt like we needed to use a zoom lens for a sequence in episode four in the pub. There are fewer zooms with character than there are prime lenses out there. When we put that lens on it was the first time I felt such a huge difference because I had been shooting for about 40 days with the traditional lenses."

Another key feature of the cinematography is the lack of any natural light apart from exterior shots, which in a show that is mostly set at night is not a lot. Trojnar wanted the light across his block of episodes to be consistent so all the locations were tented and the light was created for consistency. "I didn't want any hard light in the show," he states. "The idea was that there was a lot of overcast grey, it's not a very optimistic look. When Donny is in Edinburgh, it starts on a positive note where he's all optimistic but then really quickly it becomes more grim. So the idea was that there would be no hard light at all apart from a spotlight, which appears either in his comedy show or as a street light in episode four.

"I love the visual challenges of episode four because the episode has a slightly different narrative approach. There's not so much Martha/Donny constant dialogue and constant intrusion of Martha into Donny's world. There's more visual storytelling, so I enjoyed that a lot."

Naturalistic grading

Somewhat unusually, Trojnar's block of episodes didn't involve any pickups, but he remained with the project during post production working with colourist Simon Bourne from Company 3 on the show's LUTs (Look Up Tables). The pair created three LUTs but chose to stick with one throughout the entire series.

Trojnar and Bourne had worked together before on a commercial and that helped with the fast turnaround for the grade on *Baby Reindeer*, with just two days per episode. "Simon is incredible," says Trojnar, "his way of seeing colour and working with colour is very naturalistic. When you look at the image it doesn't feel like it's graded. In a lot of modern television sometimes you almost see that filter, you feel the image manipulation. There is quite a lot of manipulation in our image, but I think it still stays in that naturalistic grading territory."

Upon release, *Baby Reindeer* caught both the critics' and viewers' imagination. According to *Rotten Tomatoes*, it has a 98 per cent approval rating, while it climbed to number one on Netflix's Top 10 English TV titles list in its second week of release. The show is also starting to pick up award nominations and wins. Trojnar says the reaction to the show has surprised the production team. "It just blew our mind how quickly it became so popular. I knew it was a good script. It was probably one of the best scripts I've read in my short career. We knew Netflix was happy with it before it came out, it was getting good reviews. But we still thought it's such a new story, and it's also very dark subject matter. We never imagined that people would connect with it so much. It's a great pleasure to see it doing so well. ■

THE PROFESSIONAL'S GUIDE TO MEDIA & ENTERTAINMENT TECH

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STING LIKE A *bee*

A Gangster's Kiss is a new British underworld comedy that plays with the conventions of the genre. As **Kevin Hilton** discovers, part of the comic tone comes from the sound design

John Hannah's character Mem interacts with a bee

In today's more sonically aware film and television world, sound can be on a par with its visual counterparts, delivering both big set pieces for stand-out action scenes and quieter, sometimes quirky moments in more character-driven sequences. Both these audio styles feature in recently released independent comedy thriller, *A Gangster's Kiss*, with sound designer and re-recording mixer Mark Hodgkin creating both the sounds of a boxing match and a man having a conversation with a bee.

Directed and co-written by Ray Burdis, *A Gangster's Kiss* tells the story of struggling, easily-led actor Jack (Charlie Clapham), who, when cast in a gangster film, calls on his underworld friends so he can do some background research. This goes further than anticipated when he inadvertently antagonises rival crime gangs, at which point everything spirals out of control.

With the film already shot, the original intention was for the off-line edit to be done at the post production facilities of 1185 Films, where Hodgkin is head of sound. As a good working relationship developed with Burdis, the decision was made to do all post work at 1185, including the sound. Hodgkin, who had not worked with the director before, says Burdis gave him a lot of freedom in developing the sound design, telling him to have fun with it.

The starting point was the production audio, recorded by location mixer Ashok Kumar. Hodgkin says around 95 per cent of this was used for the mix, with the dialogue cleaned up using plug-ins including iZotope RX and Waves Clarity. Some ADR (automatic dialogue replacement) was done but Hodgkin describes this as "not too demanding", with little lip-syncing involved. The replaced or added lines were from characters off-camera, with only a little of the script changed in post.

While 1185's voice booth was used primarily to record Clapham's narration as Jack, it also came into play for the boxing scene, which is one of the film's audio showcases. "We ran a full ADR session

Mark Hodgkin

with all the actors we needed," Hodgkin explains. "There was a lot going on in the boxing scene so we added a bit of crowd ADR and other bits and pieces. The actors took it in turns to create the crowd rather than getting everyone to shout at the same time. We layered other elements over the production sound to bring out the crowd, every now and then having specific shouting coming through the surround speakers, just to compose the scene more."

There is a long tradition in cinema of boxing being the emotional or action focus of a film, the touchstone being Martin Scorsese's *Raging Bull* (1980). *A Gangster's Kiss* is different as it is primarily a comedy, and Hodgkin says that the way the sequence was shot is also very different to fights in other movies. "This scene goes from normal speed to slow motion and plays a lot with that," he explains. "The crowd creates the atmosphere but as soon as it goes to slow motion it's a great opportunity for some sound design, with punches getting thrown and hits and heartbeats.

Then it transitions back to real speed. The whole thing was fun to do from a sound perspective. We used a bit of Foley to get the hits and even for saliva, plus some library sounds in the low end, all layered in with specially recorded sound design."

Hodgkin adds that there were two sessions for layering up the sounds of the boxing sequence: one for the normal speed footage with the shouting of the crowd mixing Foley and production sound; and another for the slow motion segments. "In the boxing scene we had about 50 tracks including production sound, ambience, crowd, Foley, sound design, dialogue and additional ADR," he explains. "They come and go in different places, so there are times when the crowd is more muffled in the background. The first transition to slow motion is when someone shouts, which was my voice pitch-shifted at a slower tempo. At the end there's a knockout and when the boxer falls over it's the sound of a tree being felled. There are probably 40 combined tracks - and that's not including music!"

The music for *A Gangster's Kiss* was composed by John Beckett, a former guitarist for the early punk incarnation of Adam and the Ants who later moved into writing soundtracks for film and TV and is also a director of media production company Fugitive Group, which co-produced the film. "There was a good interaction with the composer, although it came late in the day when he had pretty much finished the music," Hodgkin says. "There were two or three scenes where the music had done a lot of sound design and we were competing, including in the boxing scene. John had added the heartbeat, which was vying with my sound effects. In the end, we removed that and also reduced the amount of music overall to give more space to the sound design. In another scene, a character starts hearing voices and that was done in music, not sound design. It was a good collaboration."

Like music, sound design can be used to convey a variety of emotions, from serious to funny. The funnier side is heard in the scene in which the psychotic Mem (played in suitably manic style by John Hannah) interacts with a bee. While the initial thought would be to find sound effects of bees, Hodgkin was not happy with what was available. "It's a really funny scene and the last one I did sound design for," he says. "I had to wait for the visual effects to be ready because John Hannah is basically talking to a bee, and the first thing you think when you get a scene like this is to get a bee sound effect. But it wasn't really working because the bee had more personality and there's a moment when it comes close to camera and goes back to John Hannah. I wanted the bee sound for that and in the end, I recreated it with my mouth, using quite a few plug-ins to make it sound less like me and more like a bee. No one noticed."

Even for a comedy gangster film, *A Gangster's Kiss* goes into realms of the absurd that parodies a well-established genre, with sound playing a leading role in the process. ■

A Gangster's Kiss *is available to stream now.*

> "In the boxing scene we had about 50 tracks including production sound, ambience, crowd, Foley, sound design, dialogue and additional ADR"

Charlie Clapham as Jack

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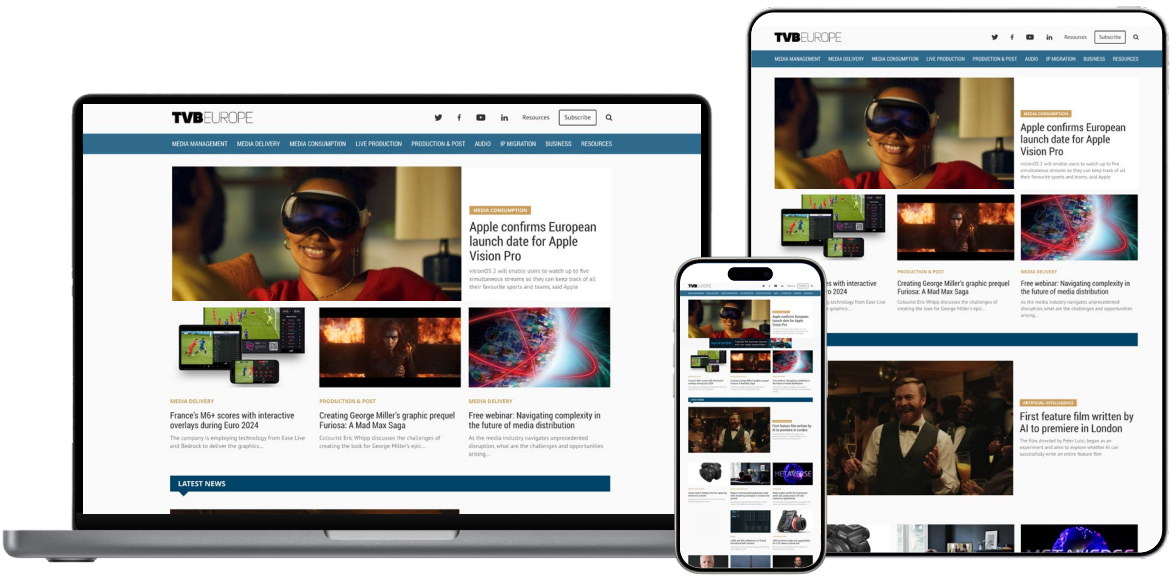

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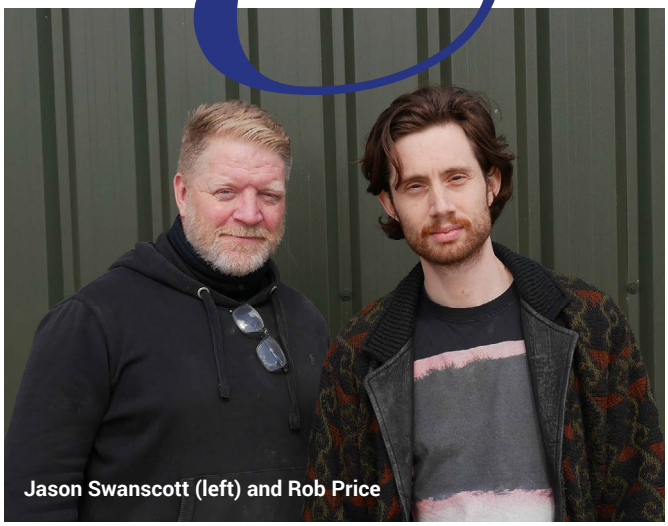
BETTER THAN THE *real thing*

When you find yourself fully immersed in an onscreen world, it's not just because of the cinematography; it's because of the sound. Kevin Emmott finds out why being heard but not seen is so important for **Rob Price** and **Jason Swanscott** at Earthsound Foley



Jason Swanscott (left) and Rob Price

On-set sound capture tends to be focused on dialogue, but it's not the dialogue that draws the viewer in. It's a crunching footstep, a slamming door or the laboured breath of a hidden assailant which punctuate the silence. These are the audible cues which tell us what's really going on, and when it's simply not possible to capture all those sounds live on set, it is Foley which delivers it.

Foley is the recreation of sounds which augment the onscreen action and is a unique mix of creativity, pin-point timing and technical aptitude. A Foley artist will add nuance to an actor's performance by inhabiting that character, adding sounds like footsteps and body movements by matching the sounds to the images on the screen, live and in the moment. And it's not just about what shoes the character is wearing and what surface they are walking on. It's also about how they are walking and the way they move.

Getting into character

"You definitely have to get yourself in that role. Whether it's a three-year-old girl in slippers or a six-foot-tall woman in stilettos,

Earthsound Foley is the largest Foley studio in the UK

you have to get into that character, you have to act and you often end up pulling the same faces the actors are pulling," says Jason Swanscott, who, alongside sound designer Rob Price, is co-founder of Earthsound Foley in Bedfordshire, UK. A Foley artist with over 250 productions on his CV, Swanscott has spent decades getting into character, having learned his craft accompanying his father Ted Swanscott and British Foley legend Beryl Mortimer on jobs as a young boy.

"Foley tries to get a sense of the character and we create sounds based on what that character is doing in the scene, how their performance is developing the story and what that character is feeling," adds Price. "We're introducing all these subtleties by performing it in the way that the actor would perform it, and adding sounds that are in keeping with where the character is at."

A purpose designed space

In 2021 the pair decided to up their game and produce everything in-house with the launch of their own studio complex.

"We've taken all the good things from every Foley studio I have worked in over the last 30 years and built them all into this room," says Swanscott of the purpose-built studio at Earthsound. "We've built it from the ground up, and everything is purpose-designed for Foley."

Boasting 1,000sq ft of recording space, Earthsound Foley is unlike any other studio in the UK. With high-profile productions like this year's *Bob Marley: One Love* and *Wicked Little Letters* under its belt, it is the largest Foley studio in the UK and every inch is designed for maximum functionality.

"For years the larger Foley studios in the UK have been closing down and there aren't many left that can cater for bigger film projects,"

says Price. “A lot of larger Foley studios are located in existing studio complexes or in buildings which have been converted, but a Foley studio is a unique space, and a really good one requires elements that are counterintuitive to any other room you might have. We knew that we were the right people to fill that gap.”

Earthsound features a 10x10m space where the floor has been dug out and replaced with solid concrete foundations to isolate it from the rest of the building

A room of two halves

Divided into two distinct sections, Earthsound features a 10x10m space where the floor has been dug out and replaced with solid concrete foundations to isolate it from the rest of the building. Rather than settle for traditional 1x1m areas, a grid of 2m long surfaces provides ample space to record resonance-free footsteps across a variety of materials, which can all be moved to create seamless transitions between surfaces. The shape of the walls and ceiling were designed to eliminate nasty reflections for footsteps, while another part of the building is designed to deliver more resonance for recording bigger sounds.

“Our acoustic design is unique in the UK,” says Price. “We can record bigger sounds which are not eaten up in the mid-range because we’re recording in a bigger room, and the space means we can be very flexible. If we need to change something, like put a door in a wall or replace the floors for a production that needs a specific kind of creaky floor, we can just do it.”

It means Earthsound can be flexible, but it also enables the team to introduce an element of realism not often associated with Foley work.

“A lot of Foley work is about faking one object for another, but the best thing is often the real thing,” says Price. “Here we have the space to run mics inside a real car in a controlled environment. We can make something sound like a bed, but here we have the space for an actual bed, which takes less time to set up and gives us more time to concentrate on the things we need to be more creative with.”

Swanscott adds: “We’ve just recorded a scene where a character is drowning in the bath. We didn’t have to fudge it in a plasterer’s bucket because we've got a fully functioning avocado green bathroom. And it doesn't even make a dent in the size of the room.”

Making it work

Foley is not just about having the right physical space; it’s also all about having the right people. Although Price uses a range of standard microphones, with Schoeps, Sanken, Neumann and DPA all in the mix, capturing the audio is only part of the solution.

“People like to promote the idea that you can self-record Foley,” says Price, who has been working with Swanscott for over 10 years. “While it's technically possible, the real benefits come from having a combination of ideas and techniques. I might be able to capture a perspective that will match what’s happening on screen, but Jason’s performance will enhance what the characters are doing, and it's the combination of these different aspects that delivers the best sound.

“I might be transforming the sound through plugins and Jason will be listening to what I'm doing and tailoring his approach. We can both adapt how something sounds, whether it’s Jason doing something with the physicality of it or me tweaking a plugin, but between us we find the approach that best suits the project. We don’t do much post production after recording; we always aim to get it right in the room, in the space.”

A computer in high heels

Like other creative industries, AI is already inching its way into sound design, with computer generated sound FX finding their way into content across multiple channels. Although a computer still can’t wear a pair of stilettos and can’t yet move like a three-year-old girl in slippers, what does the future hold for the industry?

“For any profession to assume that they're creative enough to not be affected by AI is completely naïve,” says Price. “We may see a future where AI is generating a large percentage of the sounds in a film and what we're doing may become more niche.

“But the element of Foley that adds real value is still the physical element of a human performer and all we can do is focus on the organic element of our job. That is the key to Foley and I think it may keep us insulated from the changes for a little while.” ■

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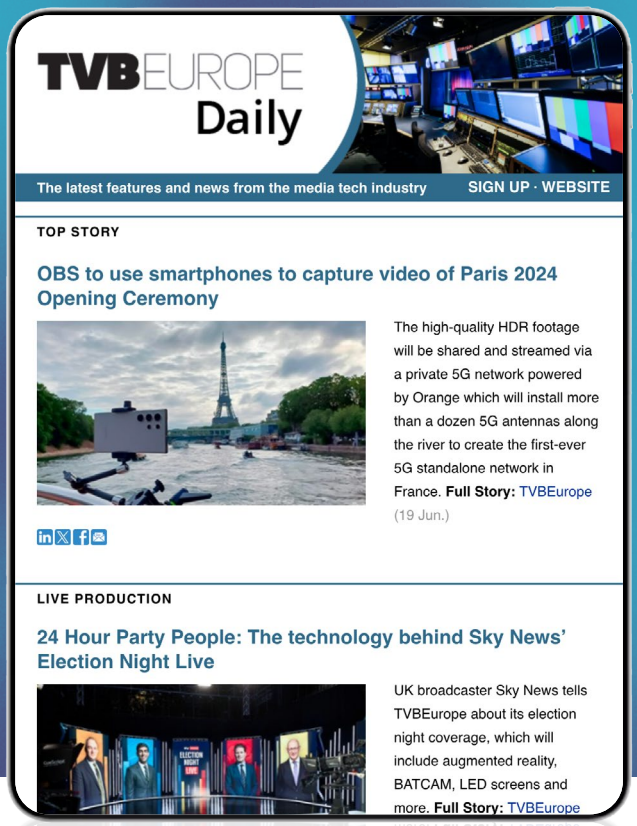

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OBS, AI AND PARIS 2024

Ahead of the Paris 2024 Opening Ceremony, Matthew Corrigan sits down with **Sotiris Salamouris**, chief technology officer at OBS and Intel's EMEA chief technology officer, **Jean-Laurent Philippe**, to hear about some of the innovations that will make this summer's edition the most widely-covered and accessible Olympics ever

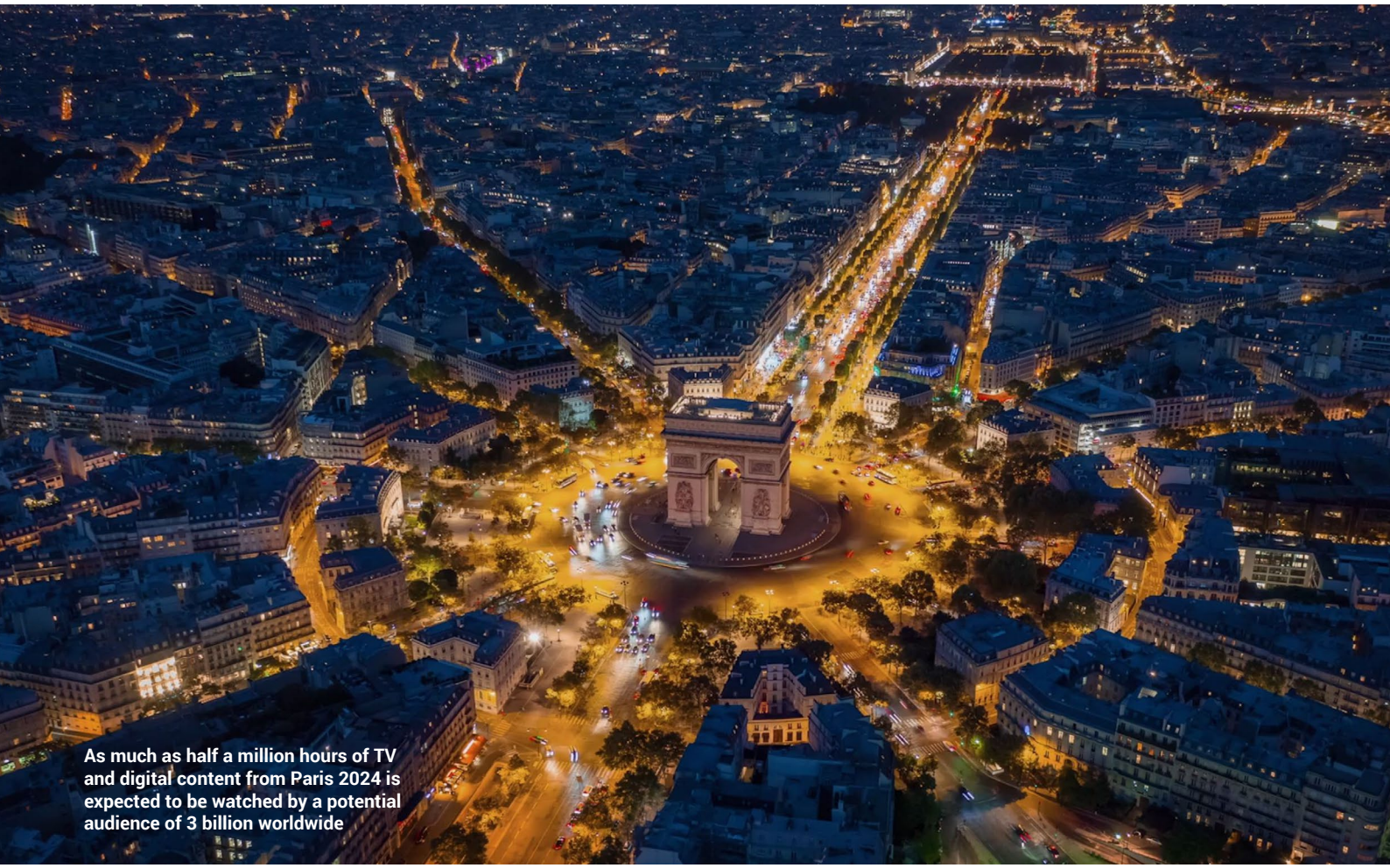
It is exactly a hundred years since the last time the City of Light played host to the modern Olympic games. Much has changed over the course of the last century. The event has grown in scope and stature, becoming the foremost sporting competition on the planet. New disciplines have been added, and records have fallen time and again as the athletes, epitomising the spirit and motto of the movement, constantly redefine the envelope of performance as they seek to become ever faster, higher and stronger.

Equally, the technology used to bring the Games to the masses has changed beyond recognition. One hundred years ago, Paris laid the foundations of what has become a quadrennial broadcasting tour de force. The 1924 Olympics was the first ever edition to be transmitted over the airwaves, its live radio broadcasts essentially inventing sports commentary.

This July and August, Paris will once again blaze a trail. As the countdown clock ticks away the hours to the Opening Ceremony, Olympic Broadcasting Services (OBS) is preparing to deploy Generative Artificial Intelligence (GenAI) solutions that will provide some of the most comprehensive coverage ever seen, capturing the spectacle of the Games for an eagerly waiting world, telling its story in ways that would have seemed fanciful to those Parisian pioneers who first lit the way.

As Paris welcomes the Games of the XXXIII Olympiad, Olympic Broadcasting Services faces a monumental challenge in ensuring the world's greatest festival of sport can be viewed across the globe. The sheer logistical challenge is immense, with broadcasters

> "AI is transforming sports broadcasts to become more immersive and individualised"
>
> **JEAN-LAURENT PHILIPPE, INTEL**



As much as half a million hours of TV and digital content from Paris 2024 is expected to be watched by a potential audience of 3 billion worldwide

demanding high quality coverage within a necessarily limited time frame. Outlining some of the figures, Sotiris Salamouris, CTO at OBS explains more than 4,000 hours of live competitive content, ceremonies and Champions Park coverage will be produced. With as much as half a million hours of TV and digital content expected to be watched by a potential audience of 3 billion worldwide, AI, says Salamouris, will be used to help tell the story of the city, the Games, and the environment. One year's worth of coverage will be delivered across the 17 days of the Games.

And, given the history of the International Olympic Committee, one cannot escape the feeling that the city itself will feature prominently as the competition unfolds.

Paris 2024 will not be the first time AI technology has been deployed by OBS, but as Salamouris explains, it will mark a significant expansion in how the technology is used. "AI is becoming more and more a part of everything. Machine learning isn't new, OBS has used machine learning since 2016, but it has intensified in the last few years. With Generative AI, we have reached an inflection point," he says. "Paris 2024 will be the first to see an explosion in the use of AI technology.

"Paris 2024 will use AI to deliver personalised, edited highlights and customised content for a huge audience," he adds. The technology means OBS can curate clips from multiple streams to deliver "highlights of everything" to viewers around the globe.

Reimagining the art of the possible

The variety of content and formats the technology enables is growing

> "We are working to reimagine the future of the Games"
>
> **SOTIRIS SALAMOURIS, OBS**

All-angle scanning can explain the sports as never before

at an exponential rate. Beyond 4K UHD distribution, volumetric capturing realises the potential of 3D content. Intel's Xeon processing enables volumetric videos to be rapidly processed, composited and compressed. Broad-scale, high quality and low latency delivery is enabled by Intel AMX, providing live 3D footage without the need for specialised equipment. All-angle scanning can explain the sports as never before, with capture from within the athletes' village bringing the story to life in a truly immersive viewing experience. "Athletes can be interviewed with volumetric scanning leveraging 20, 30, 40 cameras," explains Jean-Laurent Philippe, Intel's EMEA chief technology officer. Virtual content can be integrated into live feed and augmented reality (AR) live broadcasts.

Personalisation will form a key element of OBS' coverage. "Video is becoming pervasive," says Salamouris, his obvious enthusiasm for the coming spectacular infectious. "Paris 2024 will use AI to deliver personalised, edited highlights and customised content for a huge audience."

Using Intel's Geti platform, OBS is able to create AI solutions that rapidly curate clips at scale from multiple streams. On-demand, searchable, customised highlights will be created for delivery to audiences around the globe, moments after they have happened in the arena.

For the Opening and Closing ceremonies, Intel's AI platforms will be leveraged to showcase another first. In a proof of concept demonstration, these much-anticipated events will be broadcast in 8K over the internet. AI-optimised broadcast servers powered by the latest 5th generation Intel Xeon processors will encode and compress 8K live signals produced by OBS, once again showcasing the technological triumph of Paris 2024 and offering a tantalising glimpse into what lies just over the horizon.

And when the curtain falls on the 2024 Summer Games and attention turns to Cortina d'Ampezzo and later, Los Angeles 2028, the stellar achievements of OBS, powered by some truly groundbreaking innovation will form the starting line for the next technological leap forward which, in true Olympic spirit, will continue to push boundaries, seeking new and exciting ways to astound and delight the audience.

"The future Games' playing field will look very different," says Philippe. "The only limit to what can be achieved is imagination."

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MAKING WAVES IN SOUND

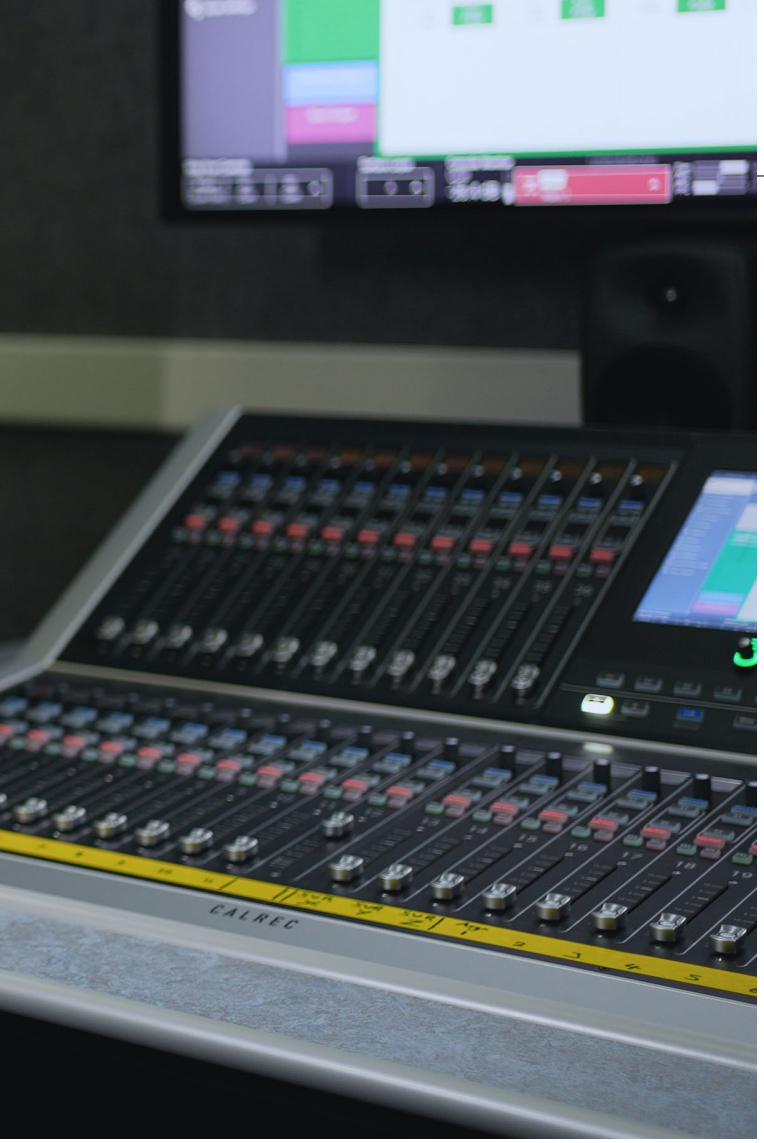
Award-winning audio engineer **Emma Penny** has been working in professional audio for over a decade. Currently an engineering manager at Formula 1, she has previously worked at Sky Sports and been a guest lecturer at Ravensbourne University London, where she's teaching media students the ins and outs (no pun intended) of broadcast audio

How did you go from studying English Literature and Drama at university to audio mixing?

Studying at Nottingham University, I worked in bars and nightclubs, but I was also doing some radio at uni. I applied to a TV company for a journalism role, they hired me as a freelancer and kept asking me to come back, and as the pay was better than the nightclub scene, I did. I knew how to drive a radio desk so they asked me to work in the sound room. I started as an assistant and worked my way up to supervisor.

What have been some career highlights so far?

I've been fortunate to work on some fun projects. I worked in news for a long time, and I really pushed myself to go into outside broadcasting because I wanted to work at Glastonbury. Within a year, I'd managed to get into the company that handled the festival's coverage, and I worked as one of the lead audio engineers at the Pyramid Stage for a couple of years, which was incredible. Another huge highlight for me has been working on Formula 1. I was part of the team (lead supervisor) that won a BAFTA in 2022 for the Abu Dhabi Grand Prix. We did a simulcast of the race on Sky Sports and Channel 4. Many people around the world were watching and to be involved in delivering it was brilliant.



According to reports by the Audio Engineering Society, women make up less than 10 per cent of audio engineers and producers. Why do you think this is?

I think one of the reasons there are so few women in this field is because women aren't encouraged to go into STEM (science, technology, engineering, and maths) roles. I'm proof that you don't need a technical degree to have a successful career in broadcast TV, but being in a technical role, or even on a media course presents opportunities. With this industry being so male-dominated, it can certainly turn a lot of women off and they might think this isn't a field for them. The truth is women can not only become prevalent in this industry, they can excel in it.

You've worked a lot with Calrec audio consoles, which features do you find the most useful?

Most OB trucks I've worked on have a Calrec in them and throughout my career, I've used the company's Alpha, Omega, Zeta, Artemis, Apollo and the Brio at Ravensbourne, as well as the RP1, Calrec's remote production unit. Prior to Covid, there was a slight shift towards remote working, which had been favoured by companies because of the reduced carbon footprint but Covid pushed that further. What people forget with audio is you're not only mixing the outgoing sounds to air, you're often looking after people's ear feeds and talkback.Taking personnel offsite, whilst keeping the presenters onsite and having the sound supervisor in a completely remote location, meant it was going to be difficult to get those ear feeds right. People need to be able to hear themselves and the people they're talking to in real-time, for example, on the other side of the world as with Formula 1. Calrec's RP1 provides a very useful solution for that. It works like having a monitor mix onsite that you can control from a desk anywhere in the world. It's easy to set up and has worked well for us.

Many audio engineers are creatures of habit. Do you follow a set checklist or have any tips you can share with other engineers?

Absolutely! If I'm building a job from scratch, I always write a rough plan that covers all the things I need to include on my sound desk. I'll normally use tape first, mark everything up with a Sharpie and then lay out my inputs one by one. Then I'll make sure the bussing is correct and look at my outgoing lines. Only after that, I start listening to signals and applying all the dynamics and EQs. I have to work in that order otherwise I might realise at the last minute that I've left something off, which isn't helpful for anyone.

What milestones have you seen in terms of technological shifts and what are the key trends?

Remote working is the biggest move I've seen. It existed before Covid, but it has accelerated since. A key benefit is an improved quality of life, anyone who works in TV knows the shifts can be long and the hours gruelling at times. It makes a big difference not to have to send an entire team to different locations. The other big trend I've seen is the move towards cloud-based architecture and how sound manufacturers are working towards building cloud-based rather than on-premises solutions for companies.

What advice would you give students about how to tap into the broadcast industry?

Companies need to have better graduate or work experience schemes so students can at least get exposure to the industry and decide if it's what they want to do. Students also need a better idea of what roles and jobs are available to them. Ravensbourne is great because they teach a lot of broadcast roles that exist in the industry. If you can get your foot in the door, you can get a better idea of how your skill set can be applied. Companies also need to have a better policy for getting young people into paid roles, which works in their favour because it gives them the chance to find the best talent. ■

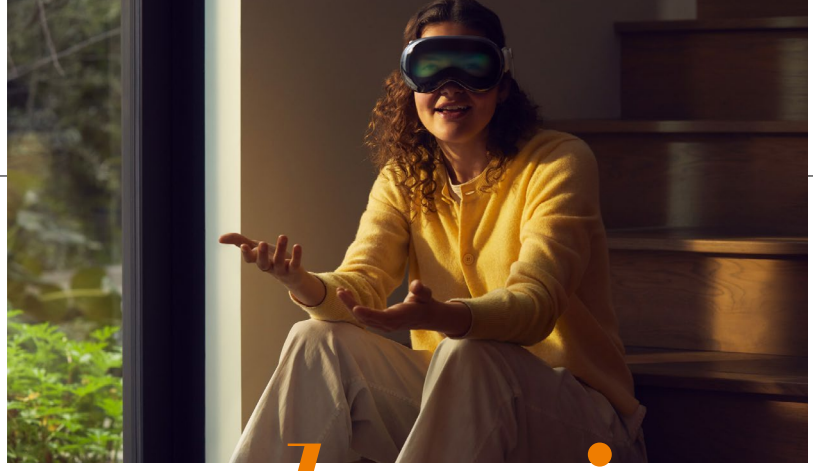


Image courtesy Apple

HEADSETS, HAPTICS AND LIVE *production*

Three industry experts share insights on the impact AR headsets could have on the future of TV production with **Matthew Corrigan**

Wearable technology has long since moved from the realms of science fiction into something now commonplace in daily life. Many of us, for example, routinely use smartwatches without a second thought. Inevitably, the broadcast industry is finding ways to utilise the latest advances. In the constantly shifting technological landscape of live production, might devices such as headsets provide a solution to the myriad challenges that must be overcome every day?

"I think headsets and haptics will become just another tool in broadcast," says Ian Fletcher, chief technology officer at Grass Valley. "The extent of their use will depend on the type and level of production needed. For many years, we won't move away from large physical control surfaces for tier one sports events. However, there are many niche sports events today, smaller events with less revenue. These are often controlled by production people who aren't fully trained production TDs, and that's where I see an opportunity for headsets and haptics.

"Even before fully replacing traditional hardware, these technologies can be used to create virtual heads-up displays," he continues. "This would allow operators to have a highly personalised monitoring experience, wrapping around them rather than sharing a multiviewer with others. With the latest high-resolution, realistic headsets, we can create small, relaxed environments with some talkback or small control surfaces. Then, using virtual displays, operators can feel like they're in a big control room, even if they're in a small room. This can happen very quickly, and broadcasters could start doing this virtually straight away."

Adam Leah, nxtedition's creative director, suggests headset development is broadly analogous with that of another now commonplace technology: "Having heavily researched using headsets with nxtedition for the IBC Accelerator this year, right now it's a little like the very first iteration of the mobile phone, we are just at the beginning of the development cycle."

Explaining further, he adds, "The headsets are rather large, a little heavy, the battery life is limited and they are a little uncomfortable to use after a period of time. That said, this technology is definitely not going away, and all these factors will improve with time, making them very useable.

"The biggest benefit I have experienced is in the area of monitoring and remote production. It's so easy to just bring up another view of data, a source, a prompter, a timing screen, a rundown and even an interactive shotbox. Then you can begin to run a show using only your hands to cut cameras, take cues in the rundown, add graphic overlays – all without a gallery. I did this standing in my garden on my home Wi-Fi, it's quite remarkable."

"Beyond providing new ways of viewer engagement, it was great to see how the device can and will transform live production as underlined by Grass Valley at NAB Show," says analyst Paolo Pescatore. "It very much feels like this was the first time we'd seen early moves to experiment in this area and have made a huge step. There is clearly a role and one that will certainly complement as well as enhance the current processes for live production."

In the fast-paced broadcast environment, it sometimes seems new technologies are deployed as fast as they can be imagined. Are there any specific use cases where headsets might excel? "Yes, monitoring is a key area where this technology could excel," says Fletcher. "Using headsets to create virtual heads-up displays allows for highly personalised monitoring experiences. This is especially useful for operators working remotely or in small production rooms. With headsets and virtual displays, broadcasters can create efficient production environments that provide the feel of a big control room without physical space."

Leah identifies another potential benefit, in which augmented reality drives agility in the workspace. "So, the real key here is the 'Passthrough' feature, where you see the real world mixed with the virtual. In this augmented reality space you can still see physical hardware such as vision mixers or audio desks. A director can then physically interact with

real hardware while enjoying the flexibility of different views of data coming in on virtual monitors and touch virtual interfaces."

The end of the OB truck?

The traditional OB truck has long been a backbone for live production. What are the chances that headsets and haptics could replace them? The consensus is that they will be with us for some time yet, although, as with the industry itself, the vehicles will continue to evolve. Fletcher explains, "An OB truck performs a lot of functions, not just monitoring. It captures all the cameras and handles replays. Headsets and haptics could certainly provide a different way of building an OB truck, allowing users to rethink what an OB truck is and how much of the production needs to be in the physical truck versus elsewhere using virtual displays.

"Replacing the OB truck should not be the goal here, everything has its place in the broadcast ecosphere," agrees Leah. "What could happen is a director inside an OB truck could have specific views of feeds or data that is not in the monitor stack. This will augment the director's view of the production with real time data that is actionable, but hard to show in a monitor stack. There is real value in enhancing the technology we already use with this tech, then the adoption is a gradual easy process without drastic change."

Pescatore broadly agrees with these sentiments, adding, "The OB truck has already gone through major change due to technological, network improvements and shift towards streaming. For now it seems evident that there is still a role for OB trucks to manage operations on site providing access remotely. For big global events, that first mile will still be heavily reliant on an OB truck."

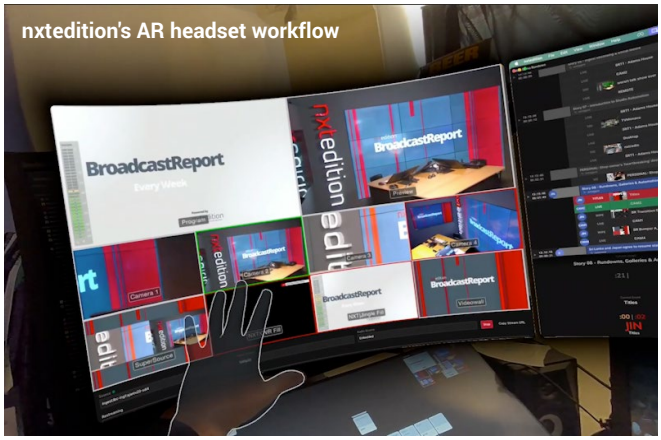
How easy is it for broadcast technology vendors to diversify into virtualised products? "Bottom line, it's not easy," states Pescatore. "Unfortunately the broadcast industry has a poor track record of embracing new technologies and techniques in this new IP driven world. This despite the arrival of new network technology developments which can finally kickstart the long-awaited acceleration of the media industry transformation. Yes, it is happening, but slowly. Two barriers are cost of investment versus return, as well driving the right cultural change needed to move into new virtualised processes and functions.

Fletcher sees potential problems caused by a lack of knowledge, adding, "It depends on the vendor. If a company has been moving in this direction for a long time and has the necessary skills, teams, and processes, it can happen very quickly. If a company still relies on traditional software or hardware, it will be much more difficult."

"If you want to use this kind of technology then you have to be using more microservice, web-based technology," adds Leah. "Remote desktop or KVM just doesn't cut it inside these headsets. First you need the physical computer close by and it adds the old enemy called latency. So, if we try to use the new tools in the same ways we used the old tools, we will never release the full potential of these new technologies. Testing nxtedition running natively in a headset's standard default browser was lightning fast, and that is only because it runs in this kind of microservices, web friendly architecture."

So, what does the future hold? As immersive technology becomes more commonplace, how can the broadcast industry leverage innovation to encourage the production teams of tomorrow?

Fletcher concedes the question is an important one. "That's a crucial point. It's easy for industry veterans like me to say we won't move away from these huge panels because that's how we've done it for the last 50 years. We must recognise that the next generation entering the industry won't be like us. They're the gaming generation, brought up on PlayStation controllers and VR headsets. They'll walk into a traditional control room and wonder why all this equipment is necessary. It's vital that designers and software developers think about this, and provide creative tools that suit the way they think and interact with technology."



nxtedition's AR headset workflow

"The simple idea that a headset could run smaller, more agile productions from anywhere without acres of hardware is an intriguing start point," says Leah. "Being able to arrive at a story location and use the headset to write the copy, ingest and upload the video content, add it to the rundown and then take over the live broadcast on site – that is something I could really see happening. It's not replacing an OB truck, it's just adding an agile, flexible production node that can see, contribute to and run a common rundown directly in the field."

"At NAB Show, one area within content creation that stood out noticeably was VR, AR, XR, spatial computing, and everything else that can loosely be collected under the umbrella term Metaverse," adds Pescatore, who sees changes to the entire process in the not-too-distant future. "The long-awaited return to this immersive way of working has provoked renewed interest, and is now firmly established in the minds of storytellers and content producers. Such advanced and immersive experiences are now becoming more accepted into high-end programming workflows, with techniques such as pre-visualisation considered essential to high-end production.

"This is encouraging and exciting for the future as all devices will be connected and we will see the gradual disappearance of pre-production and post production, until all that is left is simply production as one seamless process."

REVOLUTIONISING BROADCAST. *operations*

By **Nicolas Sturmel**, senior network technologist, DirectOut

The biggest technological impact to broadcast production in the last five years is Internet Protocol (IP) networking. Fuelled by increasing use of remote productions, media companies have been choosing to reduce reliance on expensive satellite links, transferring huge amounts of data at lightning speeds, and at lower cost, via a growing, flexible infrastructure of IP satellites and dark fibre cables across the world.

Building on an existing IT network makes accessing resources easier. Simply put, this could be a microphone in a broadcast studio. The mic is plugged into the network and can be accessed from the mixing desk by subscribing to that resource on the network, or from any access point - a remote mixing console, secondary studio or foldback system - all done without needing any additional cabling because connections are all via the network. If the studio then adds that network to the cloud, suddenly resources are available worldwide. Without significant additional financial outlay, the studio is now able to exploit its resources much more efficiently, perhaps improving archive opportunities, outside broadcasts, remote linkups and more.

Sporting events regularly exploit these networks successfully. The Olympics will be entirely IP-based, with 11 venues, mainly across Paris, transmitting 4K UHD video and high bandwidth audio via IP and cloud-based remote production systems.

Discovery Eurosport is another example, utilising 25 studios across Europe, all requiring the same visual content, but with local commentary in a variety of languages. To facilitate this for live broadcast, the original environmental audio with audience sounds is sent along with video content over the network to the station, where they add live commentary. The broadcast stream is then sent to the main distribution centre to be broadcast live to individual countries.

IP networks make this possible because reliable, flexible IT infrastructure is widely available and much more cost effective than legacy, point-to-point options. High capacity IT systems allow outside broadcasts to be agile, yet stable, making events simpler to deliver and, as a result, more competitive to produce. Fibre cables are inherently more capable of carrying data, with a single fibre optic cable, even at 1GB/s bandwidth, able to carry over 600 individual channels at 48k, almost ten times more capacity than a single MADI link. These fibre network infrastructures are not just laid by venues or studios. Fibre cables are included within new public infrastructure projects like roads and railways, increasing capability for home broadband, as well as industry. Called dark fibres, these dormant cables can be hired as and when they are needed, for data transfer between broadcasters.

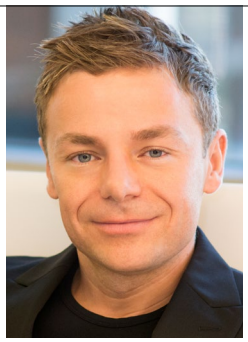
Products like PRODIGY.MX already make use of this capability. The multiformat audio matrix is capable of a 1664 x 1664 channel matrix, and the mainframe can host up to six audio network modules interfacing with the whole range of audio protocols offered by DirectOut. There are also two additional MADI slots connecting with selectable sockets. These products are leading the way, keeping up with the density of information available via an IP network.

A key concern with leaving closed networks behind and entering cloud-based sharing or publicly accessible networks is the threat of cyber-attack. In 2015, French broadcaster TV5Monde was attacked by Russian hackers posing as ISIS-sympathising terrorists. The entire outlet was affected, and channels fell off air. Luckily, an IT engineer located the machine running the attack inside the building and disabled it, limiting the long-term effects and beginning the process of restoring broadcasting.

Almost ten years on, threats such as these remain a very real risk, so protecting the networks as they are created is important. Companies like DirectOut are using this knowledge to limit the possibility of attack within their equipment. Currently, this includes internally automated shut-down of all services of a network that are not being used. This reduces the surface area available to attack. In the future, encryption keys will be included, but balancing risk management with customer experience is a real consideration for manufacturers to ensure networks remain safe and encryption is used effectively.

Broadcasters using IP networks rely on their IT departments, which have a huge amount of experience managing networks. Maintaining these strong relationships is the future of creating better products. For users, DirectOut, with the help of Globcon, offers audio technicians a simple way to exploit and manage their Audio over IP (AoIP) infrastructure, with easy discovery and configuration. Bridging the gap between IT needs and audio workflows means ensuring that AoIP remains a safe, reliable and convenient way to keep pace with modern broadcast needs, now and in the future. ■

High STAKES, HIGH *Rewards*



Dan Goman, CEO, Ateliere Creative Technologies, explains why inventory management trumps MAM

Traditional media asset management (MAM) systems were once the unsung heroes of the media supply chain. Now often considered relics of a bygone era, MAMs can be plagued by cost inefficiencies and cumbersome version control. It's time to explore how artificial intelligence (AI) and cloud technology are not just updating these older systems but fundamentally redefining cost efficiency, streamlining version control, and pioneering a new era of inventory management.

In the high-stakes game of media management, version control is like keeping track of every card in the deck. Yet MAM systems often require significant manual intervention to organise incoming media files and metadata. Manual workflows can result in mislabelled files, lost metadata, and operational bottlenecks, ultimately slowing down the entire media supply chain.

As media companies embrace globalisation and personalisation, they face the challenge of managing multiple versions of the same asset. This issue, which I call 'versionitis', arises from storing multiple versions without adequate differentiation or metadata tagging to highlight their variances. The result of not knowing what you have can create management complexities, running the risk of using outdated or incorrect versions. Even if you think you know what you have, productivity takes a hit when changes are not systematically tracked and the relationships between versions are unclear. This can lead to redundant work, missed deadlines, and ultimately affect the integrity of the final output.

Take the example of WPT Enterprises Inc (WPTE). Since its inception in 2002, WPTE has been captivating audiences in more than 150 countries with its high-stakes poker tournaments showcased on TV via the World Poker Tour (WPT) TV show, as well as online and mobile. As interest in poker grows, so does the WPTE's sprawling content library. Its dynamic global model must meet the specific branding and contractual obligations for each territory. Sending multiple custom versions of the same content to different endpoints led to significant redundancy issues in its content management.

The ever-present mandate to increase profitability forced WPTE to reflect on how technology could help optimise its budgets and reduce time to ROI. WPTE determined that the solution was to leverage AI and detailed inventory management capabilities to automate its workflow. This drastically reduces the burden on operators, mitigating the risks associated with error-prone manual workflows. As a result, WPTE no longer manually manages its numerous incoming media files, allowing it to focus on more strategic tasks.

Expensive bytes: controlling the high cost of media storage

Traditional MAMs often require significant resource allocation for maintenance and upgrades. On-premises infrastructure can lead to hefty initial investments and ongoing operational expenses. But for WPTE, the critical impact was the inefficiency in managing storage costs. Scaling up as the media library inevitably grows can be both time-consuming and costly, hampering your ability to adapt swiftly to new market demands.

With the proliferation of versions for compliance and localisation, WPTE needed to effectively minimise its cloud storage footprint. The inability to distinguish between source files and derived assets often resulted in vast amounts of redundant storage. The solution was to use advanced AI/ML algorithms to "fingerprint" incoming assets on a frame-by-frame basis, providing immediate and accurate identification. As a result, WPTE only stores the difference between versions rather than multiple large video files, dramatically reducing long-term storage by 70 per cent or more.

Cloud-based solutions ensure that updates, like new language versions or metadata changes, are instantly synchronised across all platforms. This keeps data consistent and up-to-date, reducing the risk of fragmentation and inefficiencies. For WPTE, a unified setup assures that assets are generated, managed, stored, and distributed seamlessly from one platform, erasing barriers between creation and delivery. Cloud storage allows it to adjust capacity as needed, leading to significant cost savings and the ability to adapt swiftly to changes without hefty infrastructure investments.

Stacking the deck in your favour

The limitations of traditional MAM systems are becoming increasingly apparent. By stacking the deck with AI and cloud technology, media companies can go all in on innovation, ensuring that their inventory management systems are not just efficient but also future-proof. The benefits are clear: better version control, streamlined operations, and a competitive edge in an increasingly globalised market. ■

Say that again?

Subtitling companies are starting to use artificial intelligence to create captions but, **Jenny Priestley** asks, is it reliable?

In a survey published in 2023, YouGov found that more than a quarter of British TV viewers are watching with subtitles on, and a huge 61 per cent of 18-24-year-olds prefer to read while they watch, compared to just 13 per cent of viewers aged 50-64.

With the ever-increasing amount of content available to viewers, companies that provide subtitling services are starting to look at artificial intelligence as a way to meet demand. But I recently watched a series on one of the major streaming platforms where the subtitles were so bad, that they even got the name of the show's sponsor wrong!

The use of AI and the capabilities it offers companies are all well and good, but if it can't get something as basic as the name of the show's sponsor correct, is it actually worth it? And if there are no human checks, how can broadcasters and streamers know that what viewers see on screen is accurate?

"While these technologies are amazing in their capabilities, they are still in their infancy and have a long way to go to catch up to a human's ability to transcribe speech. The weakest point is understanding subject-specific jargon, such as sports terminology and players' names," says Michael Demb, VP of product strategy for TAG Video Systems, which has developed a new language detection feature designed to enhance quality and compliance across subtitles and closed caption operations.

AI is still in its early days in terms of subtitling, and if it's getting words wrong now it needs to be taught the correct versions so that those mistakes don't continue in the future. "If you feed AI generic content, its ability to understand and process natural speech will be limited to this generic language," states Demb.

"It will take a while before we see specifically trained models for each type of content, and considering there are many of those, we will continue seeing inaccurate transcriptions and translations. Even if the content is perfect, it is still a human responsibility to track what language should be sent where. Because of these issues, automation and consistent monitoring have become even more important.

"As a child grows, they start developing an interest in various activities and learn the specifics of each," he adds. "Same with AI; training AI models using content-specific vocabulary or dataset is critical to producing accurate results."

It's not just in the local language where these problems can occur. Global streaming platforms distribute TV series and films with localised captions, but if the English subtitles are wrong (for example), so will be the French, Spanish, Italian, German etc.

"Subtitles and captions are crucial tools to enable impaired people to enjoy their entertainment choices and are equally important to people whose language in the content is not their mother tongue," agrees Demb. "We see a consistent increase in the number of people using captions with their preferred content providers. If captions weren't accurate and packed with grammar mistakes, it would be difficult to consume the content. Therefore, it is critical to ensure the quality of captions and subtitles."

So while using AI right now might seem like a good idea, it's vitally important to make sure the captions it creates actually make sense — and that requires some form of quality control in the form of either technology or a human. Because millions of others and I will be watching. ■

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