

IP based 4K Broadcast Facility Project

Background

A Global Technology Company provides facilities for online content creators, vloggers and users. The company had recently opened a high profile 20,000 sq.ft. facility in London.

The Challenge: To deliver a high profile IP-based 4K facility in record time

The Technology Company needed a partner to help design and implement its flagship London facility. After a competitive tendering process, it commissioned dB to take responsibility for the high profile project to provide a high quality, resilient system, allowing for future upgrades and expansion. The scope of work included design, implementation, test and commissioning.

The challenge was to create an IP-driven facility with cutting-edge Ultra-high definition (UHD) production equipment, three fully equipped studios, sound stages and control rooms.

The demands and expectations of new media require a different approach to conventional broadcasting. This project was to be a radical new entity: more a digital content creation and delivery facility than a conventional broadcast studio. The highest standards of audio and video would be essential, as well as maximum flexibility to allow for as yet unseen uses in this fast moving sector.

The company turned to dB Broadcast to help specify, integrate, commission and test its system. The state of the art system had to be IP based and to accept inputs of all types, allowing maximum flexibility. The project timescale was to be six months from kick off to its high profile launch.

The industry has moved on apace with more IP broadcast products becoming available, though in 2016 when this project was undertaken this was still at the early stages. One of the biggest changes over the recent past is that IP based systems are moving on from proof-of-concept test systems to operational production facilities such as this one, which provides live 4K productions using IP equipment and infrastructure. The use of IP infrastructure makes this 4K facility extremely versatile.

The Work

dB Broadcast has unrivalled experience of the changing developments now taking place in the industry with IP-driven systems, as well as an outstanding track record of delivering and managing large scale projects, and maintains the largest core engineering team in the UK. dB took responsibility for managing a number of sub-contractors for the highly specialist work that was involved in this ground breaking project.

Working closely with the client engineering team and key suppliers, dB was responsible for delivering a complete and working system, from vision and sound capture through to distribution encoders. This included studios, production control rooms, audio control rooms, editing rooms, together with ancillary facilities including a training room and community space (see below). This is a production facility for pre-made material, but also supports hosting and recording of live events.

Although elements of the project appeared similar to those of a traditional broadcasting project, the client's different operating procedures required a different approach to be followed. An adaptive, flexible and responsive approach was vital, as nothing like the system had been created previously.

The facility is based on IP based technology - one of the first broadcast facilities in the UK to offer live 4K productions over IP. The largest of the three studios comes loaded with a Dolby-certified Atmos® 4K screening option where users can shoot their content in UHD.

dB Broadcast's approach comprised three phases:

- A design phase for the capture and validation of the client's Technical Specification, progressing to high level and detailed design steps and equipment procurement;
- A prefabrication and installation phase involving the build of systems at dB's factory near Cambridge, followed by delivery to site and installation;
- An on-site test and commissioning phase.



Dolby Atmos® screening



dB worked with selected equipment providers who could provide the hardware, software and supporting systems to bring together the complex project. They then assembled the complete system which included an Evertz Software Defined Video Networking (SDVN) solution for the facility, at the core of which is the EXE28-VSR, with capacity for up to 1152 10GE ports and with 23Tb/s high capacity switch fabric and MAGNUM, for SDVN Orchestration and Control.

High capacity switchers



Ross Acuity and Expressions



Other leading edge equipment included: Ross Acuity Vision Mixer and Xpression 4K graphics, Sony PMW-F55 4K cameras with fibre connection, Sony BVM-X300 4K OLED reference monitors, Evertz media Gateways, Elemental Live encoders and Riedel Artist Voice Over IP intercom system - the first Dante based SSL System T audio production system to be installed in the UK.

Sony PMW-F55 camera



Audio was extremely important to the creators, as live music would be launched from there. The decision was taken to deploy a Dante based integrated system for audio for the entire system over a single, standard IP network. Based on industry standards, Dante is an uncompressed, multi-channel digital media networking technology and has been widely adopted. The principle benefit is wide interoperability and mixing of equipment from leading manufacturers. Using logical routes

instead of point-to-point connections, a network could be expanded and reconfigured in software at any time.

The overall desired impact of the facility was to be impressive, ergonomic and stylish and flexible, creating the best impression with content creators. For example, the furniture included a high specification Opus Magnum desk – the first to be deployed in the broadcast industry.

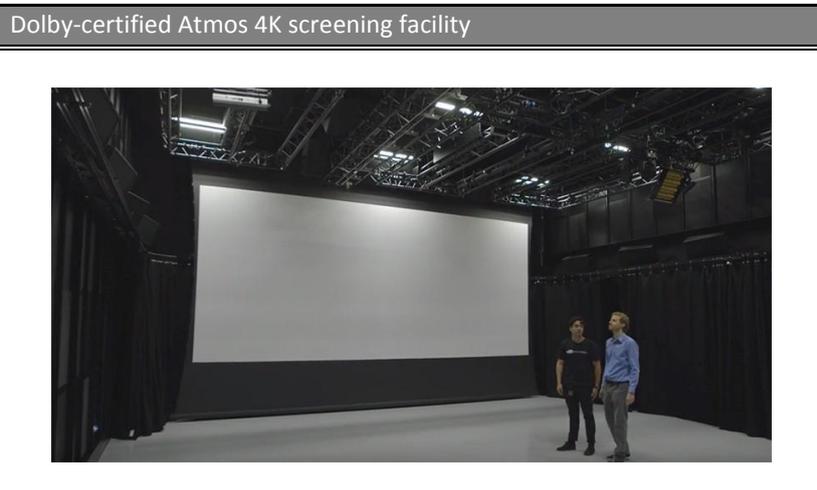
Production Control Room 1



Overview of major facilities

The London facility is used for recording and live productions, and for post-production, linking in with other studios around the world. Live events are streamed to existing distribution platforms using resilient encoders.

- **Studio 1** – this large space is a 4K UHD double-height studio capable of hosting a full band. It is equipped with front of house mixing, fully controlled motorised lighting grids, a spring loaded studio grade floor and ceiling track for robotic camera. Screening room facilities including 4k cinema projector and server, motorised perforated projection screen and a fully integrated Dolby Atmos certified loudspeaker system. The audio system is hugely powerful, its bank of amplifiers has individual power supplies and a total of 40 loudspeakers are installed, all driven from a 64-fader large format console.



- **Studio 2** – another 4K, IP driven double-height studio of medium size and also built to a very high standard of audio reproduction, with motorised lighting grids and flat studio grade floor. A 16 fader surface controls the audio.

- **Production Control Room 1 (PCR1)** for large live productions with control of cameras, lighting, vision mixing and graphics; yet simple to use for smaller productions.

- **Audio Control Room (ACR)** – this top-flight studio resembles a recording studio and works alongside the vision PCR1 control room. It comprises an audio mixing space for live production from any studio or external locations; also arranged for mixdown and post production. Mainly working in stereo with support for 5.1 surround sound. The

flexibility of the IP approach means that ACR and PCR1 rooms can control any of the studios, rather than one control room dedicated to one studio.

Solid State Logic's System T networked audio infrastructure

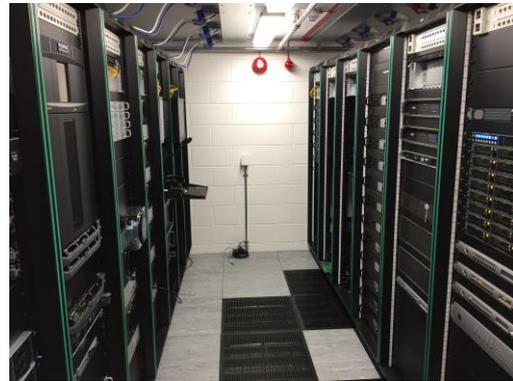


- **Edit & Training Room** – a flexible space (c. 70m²) for training sessions and presentations. Technical facilities include: a large flat panel display screen, ceiling mounted main and surround sound loudspeakers, AV switching and control panel – capable of being used with local laptops and displaying video available from the main router. Connections for use as an ad-hoc filming location.
- **Edit Bay** - an edit suite for two people working on one production
- **Central Technical Area (CTA) (Server Room)** - houses 30 equipment bays for all the facilities, and these are fitted with dB's IP based intelligent mains distribution unit giving engineers remote control and configuration facilities. Using a combination of best practice from IT data centres and broadcast facilities, the CTA is fitted with structured top-of-rack fibre cabling in many cases, with no cables being used directly between bays. Patching to a central bay and out again allows re-patching as requirements change, rather than disruptive re-wiring.

Optical camera patch panel



Server Room



Benefits to Client

The result

The London facility went live towards the end of 2016, and was the first IP based UHD production system within the UK. Set across 20,000 square feet and with street-level access, the space houses three fully-equipped, double-height studios and soundstages benefitting from the flexibility provided by an IP infrastructure. The production equipment available to creators now includes a range of 360-degree cameras and rigs, VR experiences, and 4K screening facilities giving creators the ability to live stream 4K to online – a UK first.

Tom Swan, Sales and Marketing Director at dB Broadcast, has commented: “Using IP based routing systems, we have created an incredibly flexible UHD facility, with audio and video available anywhere, at any time and in any format.”

Lessons for the Future

dB Broadcast's experience and knowledge in IP and 4K implementation has grown rapidly since the trend to IP infrastructure took hold in the last few years. This project is a good example of how more people are doing more things with media than ever before. This brings with it new challenges for content creators, editors and broadcasters alike.

Tom Swan, Sales and Marketing Director comments: "Having successfully completed major high profile projects such as this, we can offer clients the ideal combination of traditional broadcast industry experience and capability for the new wave of technologies now being demanded. Our industry skill is becoming more widely relevant to new groups of content creators. We're engaging with non-broadcast industry clients. The future will look very different. These are exciting times and we're going to see some really interesting developments both within the industry and at the interface with other sectors.

