PURE LIVE

(D) 25,00 €

Special Edition
Live Companies

08/2018

www.live-production.tv

LIVE PRODUCTION

DIRECTORY 2018

The Business of Live Production

Live Production: IP Revolution's Next Step

SDI digital has served us through the evolution of HDTV, and is still serving us for UHDTV. But recent technology evolutions have reached the point where IP networks are now suitable for the kind of bandwidths we need to build similar scale systems as we do with SDI, to accommodate higher bit rates that UHDTV brings, and offers us virtually unlimited scalability and size through the technologies and techniques available in the IP domain. Therefore, we can leverage everything that is going on as a result of the IP revolution and technology development and not have to re-invent the wheel. Instead, we can take our unique value-add, which involves an intimate understanding of how to handle media essence, how to convey it and synchronize it, and build on top of that foundation.

ST 2110 allows us to replicate the existing systems we build today with SDI - to emulate them entirely. Essentially, we can take an SDI signal, fully transport it as independent essence streams over IP, and put it back together anywhere else and make another SDI. ST 2110 takes the video/audio essence apart, we can transport video on one stream, audio on another stream, and metadata on yet other streams. That opens the door to many advantages such as taking audios and sending them off independently into an audio sub-system, without the burden of all the video overhead of SDI; or taking a closed-captioning stream and sending it to a service in the Cloud over IP, since IP connects us to the Cloud now, and that cloud service could translate it to many languages – both text, and spoken word – and send the resulting caption and audio streams back for multi-language program integration into the system workflow. In other words, we can now build highly efficient and flexible media systems, which move around and deal with only the essential pieces needed.

NEP Andrews Hubs: A Highlight in IP Live Production

To overcome the obstacles of distance and location in remote production, NEP created centralized Internet Protocol (IP) production centers in Sydney, NSW, and Melbourne, VIC, which are named in memory of NEP Australia's late and much-loved CEO, Keith Andrews, who championed the initiative.

The Andrews Hubs are the world's most advanced facilities of their kind, able to cover up to seven simultaneous live events from 29 connected venues around Australia. They're also arguably the world's most flexible: 100 per cent IP and also multi-format for any production requirement, including 4K, high dynamic range (HDR) and any framerate (See page 6 for Andrews Hubs and page 98 for the NEP IP 21 truck).

OB Fleet is Growing Worldwide – A View to China and Japan

In China the first OBVan had been built in 1958 following the foundation of the first TV station named China Central Television (CCTV). Later on there were more OB vans in China owned by CCTV and a few local TV stations. At that time the production to cover events was very simple and the OBVans were simple too. Usualy only one OBVan was used for a live production with 3-4 cameras only and without recording equipment until 1970 (see page 45). Today we see some of the most advanced OBVans on the Roads in China. Renowned for its pioneering approach to programming and the use of new technology, Chinese broadcaster Hunan TV has created the first Dolby ATMOS equipped OB truck in China (page 41). Find Liaoning HD OB-3 on page 78 and Shanghai Media Group UHD-6 (page 122).

With just two years to go before the 2020 Summer Games in Japan, many broadcasters across the country are planning to upgrade or expand their studio and mobile production infrastructure (page 12). The technical specifications of Sky Perfect Broadcast SPBC 4K HDR we present on page 126.

High-End Sport Productions

Already dubbed the "best-ever FIFA World Cup", the 2018 FIFA World Cup™ came to a thrilling end in Moscow with the final between Croatia and France, with football fans and casual viewers alike following on TV around the world. In many territories, broadcasters achieved viewing figures that matched and even bettered the consistently excellent audiences they had enjoyed right throughout a thrilling and unpredictable FIFA World Cup™ that kept football lovers everywhere glued to their TVs. Read the story of the production of the international signal on page 188. Another Highlight is the first UHD live broadcast of an EHF handball Final4 production on page 170 or the Volvo Ocean Race. To bring the close-up racing action to video screens, only wireless broadcast technology and expertise allowed the event organisers to broadcast high quality video (page 54).

Reinhard Penzel
reinhard.penzel@live-production.tv

LIVE PRODUCTION

High-End Show Productions

The Eurovision Song Contest (ESC), already running for 63 years, is one of the most debated, loved, and hated entertainment formats ever created and ESC has grown to become a true annual behemoth in live TV production and a cultural phenomenon around the world. Since the contest started to be widely promoted on social media and streamed live on the Internet, the originally European base of ESC's fan base has evolved globally, conquered millions of additional viewers in Asia, South America, and North America, and participating countries, which recently expanded to include Australia (page 138). In addition, we had a look to the "The World of Hans Zimmer", which is touring Germany's largest sports halls, with a few detours to Switzerland and the Netherlands thrown in (page 146) and we visited Italian superstar Vasco Rossi at the Stadio San Nicola in Bari together with 50,000 adoring fans (Page 152).

Enjoy

CONTENTS

LIVE
Reports
EVENTS

Reports

Portraits OB Trucks

LIVE
OB Trucks
TECHNICAL SYNOPSIS

NEP DELIVERS WORLD'S 1ST TRANS-CONTINENTAL LIVE UNCOMPRESSED BROADCAST OVER IP

The challenge

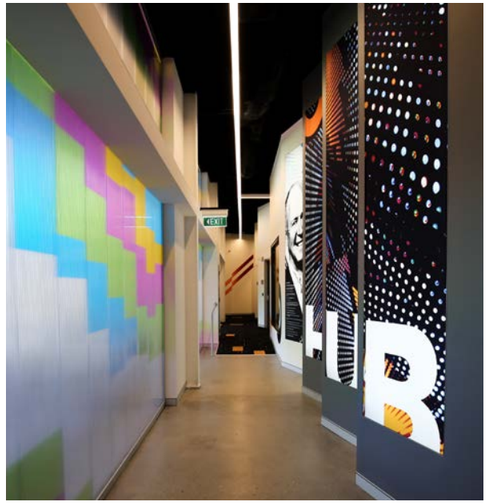
Australian sports venues are spread across a vast geographic territory that is larger than the continental US or Europe. Because much of the country's interior is sparsely populated, covering events has until now required extensive crew travel hours and expense. Historically it was common for production team members to spend up to two days travelling to cover a one-day project. Meanwhile, the logistics of moving crew between locations meant people and infrastructure were used inefficiently. The fact that Australia's robust market for live, local television production relies heavily on a small pool of skilled freelancers compounds the issue.

The solution

To overcome the obstacles of distance and location in remote production, NEP created centralised Internet Protocol (IP) production centres in Sydney, NSW, and Melbourne, VIC, which are named in memory of NEP Australia's late and much-loved CEO, Keith Andrews, who championed the initiative.

The Andrews Hubs are the world's most advanced facilities of their kind, able to cover up to seven simultaneous live events from 29 connected venues around Australia. They're also arguably the world's most flexible: 100 per cent IP and also multi-format for any production requirement, including 4K, high dynamic range (HDR) and any framerate.

NEP Australia's Director of Technology, Marc Segar explains: "The Andrews Hubs allow for a totally distributed human resource, where the team working on a project no longer have to physically be together but can now work across many locations using modern communications tools to maintain a team approach."



NEP had been looking at centralising production for some time, and in response to a request for proposal from a key client in August 2016 they designed, constructed and deployed the hubs within a tight 14-month timetable. While an IP infrastructure was always the logical approach, when NEP began the project the SMPTE 2110 standards were still in final draft, and no manufacturer had SMPTE 2110-compliant equipment.

"The challenge of working with 'vapour products' was significant, but it helped shape our exact requirements and ensured all components were tailored to our needs," Segar adds. "Some of the world's leading manufacturers were quick to jump on board and partner us in making the hubs concept real. There is simply no way we could have done this in the timeframe in serial digital interface (SDI), nor could we have achieved it even a year earlier: the technology just wasn't there. We also wanted to push the boundaries of anything done before, and that's why there isn't a single SDI cable anywhere in our transmission chain – from the camera control unit (CCU) in our IP truck to the broadcaster."

All design work and drawings were done by NEP's in-house Systems Integration team, from the first drafts to the final versions including all the trucks, hybrid kits and the two production hubs themselves. Ninety per cent of cabling is fibre from NEP's central distribution rack, with the remaining cables Cat 6 for lighting and access control, the corporate network and telephone system. To connect 29 venues to the hubs, NEP engaged Telstra to build a country-wide Distributed Production Network (DPN), with a fully redundant network at 50 Gbps.

To accommodate cameras, microphones, their operators and an on-site engineer (the only crew who now need to physically move from project to project) NEP built four new IP-based production trucks and upgraded seven existing outside broadcast vehicles to IP.

A comprehensive video conferencing system enables a split production environment: cameras are located at each operational venue, but all program production staff – including the director, vision switcher, audio director, graphics and relay operators – are based at an Andrews Hub control room in Sydney or Melbourne. Those cities were chosen because of the majority broadcast professionals who work on Australia's major sporting codes reside in one or the other: Sydney is the centre for Rugby Union, Rugby League and football (soccer), with Melbourne home to the production community supporting Australian Rules football and cricket. "So long as they are connected to our network, anyone can work from anywhere," Segar says.

The two sites are completely redundant and can share all their resources, including replay, production switchers and graphics – in fact just about anything that an operator needs to do their job.

NEP AUSTRALIA'S ANDREWS HUBS AT-A-GLANCE

- ***2 co-joined, centralised SMPTE 2110 production centres located in Sydney and Melbourne***
- ***29 connected venues on the new Telstra Distributed Production Network (DPN)***
- ***3 additional connected venues by dark fibre (currently)***
- ***Ability to add new venues as they come online either by DPN, dark fibre or other form of connectivity***
- ***7 centralised production control rooms***
- ***4 new connected 100 per cent SMPTE 2110 Internet Protocol (IP) trucks***
- ***7 existing trucks with new hybrid SMPTE 2110 IP layer ('hybrid IP trucks')***
- ***50 gigabit per second fully redundant network***
- ***100 per cent IP transmission chain***
- ***14-month timeline from contract to completion***

1ST

Proof of concept

The Andrews Hubs passed a major milestone on 21 December, 2017 in producing the world's first live-to-air SMPTE 2110 uncompressed high definition (HD) remote production. A Football Federation Australia A-League match between Brisbane and Perth held at Brisbane's Suncorp Stadium was produced and directed 920 kms (570 miles) away at NEP's Sydney Hub in Eveleigh, just south of the city's central business district.

Live uncompressed HD signals from 10 Sony HDC 4300 4K/HD cameras at the venue – including high frame rate cameras – were sent to Sydney via the Telstra DPN.

HD video conferencing supported the split production, with the entire production team aside from camera and microphone operators based at the Sydney Andrews Hub. The final program was then delivered to Fox Sports via IP for live-to-air broadcast – proving the hubs were fit for purpose and putting NEP squarely on track for the facilities to come fully online in the first quarter of 2018.

THE ANDREWS HUBS SHARED CORE (SERVICING SYDNEY/ MELBOURNE)

- *Arista 7508R, 75TBs chassis: 2 in each hub in a hitless configuration*
- *336 channels of EVS (78 operator stations)*
- *Telex ADAM Communications Matrix*
- *Meinberg redundant precision time protocol (PTP) station reference*
- *Lawo VSM (Virtual Studio Manager) control system*
- *Lawo V_Matrix virtualized processing core: SMPTE 2110 and/or 2022, or conversion as required*
- *SDI conversion as required*
- *WAN gateway*
- *Hitless re-alignment*
- *Multi-view*
- *Frame stores*
- *Colour correction*
- *VC-2 compression*
- *4K up and down conversion*

Trans-continental triumph

On March 10 NEP again made history as the Sydney Andrews Hub produced its first trans-continental live uncompressed broadcast: the FFA A-League match between Perth Glory and the Central Coast Mariners held at NIB Stadium in Perth: 4,000 km (2,400 miles) apart.

"This was significant, as it was the first time that SMPTE 2110 had been used across that distance with a latency of just 48ms round trip: just over one frame of video," says Segar. "It also reinforced that the hubs integrate seamlessly in a 'regular' weekend in which we deliver multiple events around the country from different sporting codes."

Based in Perth was NEP's IP 21, a 13-metre all-IP production truck, housing the only onsite staff: camera operators, audio technicians and commentators; the remaining production team members were in Sydney. Uncompressed video and audio were delivered via the Telstra DPN to produce the show, which was then sent over IP to Fox Sports for live broadcast.

Benefits

NEP's new centralised model and associated workflows have cut in half the number of crew needed to move between a typical project. The benefits also go well beyond travel cost savings. For example, the team producing the Perth A-League match on Saturday night were able to do another job the following day, which otherwise would have been lost to travel. It also means fewer days spent away from home, more time for training, and the chance for crew to work on a wider variety of projects.

In a roundabout way, the hubs offer an environment akin to that of a traditional broadcaster, where staff come to the facility each day. "We've taken care to create a comfortable, practical environment that people want to work in," says Segar. "Staff like the size and relative quiet in the control room. It makes for a more relaxed, happier production team, and we make better TV because of it."

CONTROL ROOM FEATURES (7 currently)

- *8 ME Sony XVS 8000 100 per cent IP switchers*
- *Lawo MC296 72 fader surface audio console*
- *Boland ultra-high definition (UHD)/high dynamic range (HDR) monitor wall*
- *UHD 4K and HDR capable*
- *Ross "Newt" edge IP to serial digital interface (SDI) where required*
- *NEP's "The Wall" multi-view monitor wall configuration*

Future

In the year from March 2018, NEP Australia's Andrews Hubs are set to produce more than 250 events, including the FIFA World Cup from Russia, with 500 or more events in 2019.

The company is also looking to deploy its hub capabilities beyond Australia's shores, and in late April delivered the world's first remote production across the Pacific. The successful trial was conducted over four days between the Sydney Andrews Hub and Telstra's Los Angeles datacentre – more than more than 7500 miles (12,000+ km) apart – using VC-2 ultra-low-latency compression technology and the Telstra DPN.

30 HD camera feeds in LA were linked via diverse and hitless 10 Gbps circuits on the DPN, with the production taking place in Sydney, overcoming what until now was considered an insurmountable distance. The tests confirm that the Andrews Hub control rooms in Sydney can efficiently produce broadcast events held in Los Angeles and, arguably, beyond.

Segar notes: "Our crew at the Sydney Andrews Hub perceived no appreciable difference between covering the trial event in LA and the remote broadcast of the live A-League match from Perth last month. This trial proves anyone can work from anywhere while connected to our network, whether in Australia or on the other side of the planet."

1ST

Telstra's Head of Broadcast Services, Trevor Boal, adds that as Telstra's network capacity and reach continues to grow, "it's conceivable we could traverse global distances uncompressed in just a few years."

The successful trans-Pacific trial is just the start of NEP's extensive program to trial other locations around the world, including Japan and the UK.

IP TRUCK SPECIFICATIONS (4 currently)

- *World's first 100 per cent SMPTE 2110 IP broadcast trucks*
- *16 x native SMPTE 2110 Sony IP camera control units (CCUs)*
- *2 x 12-channel EVS machines*
- *3.5 ME Sony XVS 6350 SMPTE 2110 IP switcher*
- *Lawo MC56 IP audio console*
- *Telex IP communications*
- *30 x SDI inputs*
- *30 x SDI outputs*
- *UHD 4K and HDR capable*
- *Scalable to suit project and connectivity*
- *IP transmission to the hubs*

Japanese Broadcasters Prepare for

2020 and Beyond

With just two years to go before the 2020 Summer Games in Japan, many broadcasters across the country are planning to upgrade or expand their studio and mobile production infrastructure.

Ikegami Tsushinki offers a range of cameras, switchers and monitors for integration into OB vehicles. These can be configured for use in operational roles such as news reporting, sports and theatre-stage productions. We design, equip and fully configure systems ranging in size and complexity from small SNG OB vans to large 8K OB articulated trucks.

UHD-capable Multi-Role Truck for Miyagi Television Broadcasting

Ikegami recently completed a medium sized OB vehicle for Miyagi Television Broadcasting, a Nippon TV affiliate company based in Sendai city. The emphasis in this design is on space efficiency but providing the production versatility expected of a large-sized production vehicle. This vehicle is designed primarily for provided HD coverage of sports like baseball or golf as well as outside events such as concerts. Onboard equipment includes an Ikegami HDK-970A camera with a BS-98 base station.

The HDK-970A is a full digital 3G-HD-SDI 59.94/50 Hz studio/EFP system with advanced 16-bit digital signal processing. Increased dark-area graduation ensures natural colour reproduction across the full luminance range. Other features include operator-adjustable gamma curve, lens aberration correction and support for a wide range of HDTV formats including 1080i 119.88/100 Hz (optionally).

The HDK-97A is a compact variant with similar features but designed for operation from a nominally 11 volt direct current power supply.
The BS-98 is a half rack size Hybrid 4K base station. It supports Ikegami's conventional one-by-one ICCP control or Arcnet based network control systems and an Ethernet based control system, allowing customers to choose the camera control system based on their needs.
Camera feeds entering the Miyagi Television Broadcasting OB vehicle connect into an Ikegami MuPS-4000 multi-platform switcher. The switcher is 4K compatible, giving MTB a potential upgrade path to UHD if required at any time in the future. The MuPS-4000 combines the roles of a production switcher, routing switcher and multi viewer channel selector in one compact chassis. It is configured with 36 inputs 18 outputs, two mix/effects layers, two 3D effects channels, 16 chromakey channels, a 12 channel video display resizer and integral video storage. Additional production facilities in the MTB truck include slow-motion, combining the camera's double-speed 1080/119.88i output capability with server-based slow-motion playback.

Marathon OB Vehicle for Nippon TV

Based in Tokyo, Nippon Television Network Corporation (Nippon TV) broadcasts terrestrially across Japan and by satellite. It recently commissioned a 6.6 metre long x 2.3 metre wide x 3.7 metre high OB vehicle from Ikegami. Shown in Figure 4, this is designed primarily to allow efficient live OB coverage of road-race sports events such a marathons. Key requirements were the need to provide space for a commentator and to ensure that the production facilities in the vehicle combined easy operation and full functionality within the compact internal space. The vehicle includes an Ikegami CSS-400 production switcher housed in a 1U 290 mm deep chassis.

Developed for use in a wide range of applications from simple switching to programme production. The CSS-400 is equipped with 18 inputs, nine outputs, two mix/effects layers as well as peripheral functions such as frame synchronisation, colour correction and a multi-viewer. This model is available with two types of console panels, each separate from the main frame. One is for production and the other for simple switching. The simple switching console is 2U in height so a total of 3U height is enough for setup with the main frame. Other equipment integrated into the system includes an Ikegami MuPS-4000 router with 45 input and 36 output channels plus an 18 division multi viewer feeding a monitor display panel.

Moving Forward into High Dynamic Range and Ultra High Definition

Introduced at the April 2018 NAB Show in Las Vegas, the Ikegami HDK-99 full digital 3-CMOS Full-HD HDR camera succeeds the HDK-95C as the elite offering in our Unicam HD series. A docking-style camera for portable and studio applications, it employs three 2.6 megapixel high-performance CMOS image sensors delivering high picture quality in HDR at 1920 x 1080 resolution. HLG mode maintains the high contrast required for HDR and conforms to the ITU-R BT.2100 international standard. Signal-to-noise ratio is >62 dB and sensitivity is a high F11 (59.94 Hz). The sensors natively support 1080i /59.94, 1080i/50, 720p/59.94, 720p/50, 1080p/29.97, 1080p/25 and 1080p/23.98. Also supported are 1080p/59.94, 1080p/50, 1080i/119.88, and 1080i/100 3G HDTV formats. Integral to the HDK-99 is the Ikegami AXII processor which allows fast and precise colour matching for live multi-camera applications. A Lens Aberration Correction function minimises resolution loss and coloured edging caused mainly by optical chromatic aberration. Quick EZ Focus Assist provides distinct enhancement to the viewfinder signal, enabling the camera operator to make critical focus adjustments. Area size, area colour, edge colour and display time on the viewfinder are all adjustable from the camera menu.

At the April 2018 NAB Show in Las Vegas, Ikegami debuted the new UHK-435 which stands as the world's first 2/3-inch 3-CMOS sensor UHD/HD full studio camera. This model provides true UHD via three 2/3-inch 3840 × 2160 CMOS sensors with RGB prism optics, delivering this resolution from 24 million pixels (8 million per sensor). As the full-size, studio companion version of the UHK-430 4K camera from Ikegami's Unicam XE camera series, the UHK-435 captures the extended depth-of-focus of the 2/3-inch format and permits use of the full range of B4 studio and field box lenses.

The UHK-435 delivers wide dynamic range and wide colour gamut, fully supporting Hybrid Log-Gamma conforming to HDR International Standard ITU-R BT.2100. Ikegami Unicam XE series peripherals such as the CCU-430 camera control unit, VFL701D 7-inch full HD LCD viewfinder and VFE741D 7.4-inch OLED viewfinder are fully compatible with the UHK-435. The viewfinder can be positioned close to the extended line of the optical axis. In addition, interfaces are available for a wide range of 4K signal protocols including Quad 3G-SDI, 12G SDI and IP.
For image display purposes in studios or OB vehicles, Ikegami's new HQLM-3125X HDR broadcast production monitor employs a 4,096×2,160 pixel 10-bit resolution LED-backlit LCD panel with a 1,000,000:1 contrast ratio. Fully compliant with BT.2020 wide colour gamut, the HQLM-3125X incorporates single-channel 3G-SDI × 5, 3G/HD-SDI and HDMI inputs as standard features. Square-division and two-sample interleave sources can be connected to the monitor via 3G-SDI × 4. A dual-channel 12G-SDI input is also available for other 4K equipment. Viewing angle for critical image evaluation is a wide 178 degrees (horizontal/vertical). In addition to its picture monitoring role, the HQLM-3125X can operate as a waveform monitor and vectorscope. It can also display vertical-interval timecode, eight channel SDI-embedded audio level and closed-caption subtitles.

The 'Virtual Reality' Future

Looking beyond HD and UHD to a 'virtual reality' future, broadcasters are increasingly seeing wall-to-wall 8K displays as the most practical option for a future world of delivering fully engaging television, rather than socially isolating and in many cases uncomfortable head-worn displays. Ikegami has worked closely with the broadcast industry to develop compact, reliable and versatile 8K production equipment both for studio applications and for use on location. In September 2015 we delivered to NHK the world's first 8K OB production vehicle. This was fully equipped and configured to operate as a complete mobile 8K broadcast production facility capable of producing television of unsurpassed picture quality, complete with 22.2 channel surround sound. It was equipped to operate with up to 10 8K cameras feeding into up to four 8K recorders and slow-motion players. Figure 2 shows the production suite. The vehicle's specifications allow operation not only in Japan but worldwide.
The road map for 8K broadcasting in Japan, announced by the Ministry of Internal Affairs & Communications, specified that trial broadcast transmissions would be conducted in 2016 with regular 8K broadcast services beginning in 2018.

NAB 2018 visitors were able to experience Ikegami's SHK-810 8K camera. Developed with Japan Broadcast Corporation (NHK), the SHK-810 is notable for the significant size reduction and lightweight design that it brings to field and live production, operating with the same ease as current broadcast cameras. The SHK-810 employs a 33 million pixel Super 35mm CMOS sensor with PL lens mount, achieving a limiting horizontal resolution of 4000 TV lines. This portable camera uses standard SMPTE hybrid camera cable between head and CCU with available portable and studio viewfinders. Pictures from the SHK-810 were displayed at NAB on a prototype Ikegami designed 55-inch full 8K resolution LCD monitor.

Ikegami

SKY SPORT HQ EXCELS WITH HIGH-TECH IN ALL AREAS

With Sky Sport HQ as the new broadcasting and production centre in Unterföhring near Munich, Sky Germany rightly adorns itself with one of the most modern sports broadcasting centres in Europe.

Sky invested in the new building to keep up with its steady growth in Germany and to gain more flexibility through in-house productions. The new broadcasting centre Sky Sport HQ produces numerous live broadcasts of the 1st and 2nd Bundesliga, DFB Cup, Europe League and Champions League and also manages the company's social media channels. Thanks to its extraordinary concept and the use of state-of-the-art technology, Sky Sport HQ has quickly become a crème de la crème TV broadcasting centre and the flagship of Sky Germany.

Sky Sport HQ covers a total area of 4,600 square meters, of which 1,700 square meters are used by four high-tech live studios. The broadcasting centre has 41 rooms. Here, around 50 kilometres of cable were laid to get the technology up and running. According to Sky, the company is able to produce and broadcast up to 12 programmes in parallel on one weekend. Sky Germany operates five sports channels that broadcast around the clock. According to the company, ten additional channels can be added to broadcast up to fourteen different sports events on one weekend. However, this tremendous output requires an enormous effort in technology, equipment and, of course, many employees.

At first glance, it is hard to imagine the capacities and technical work involved in this project. For the new building, the TV station invested a sum in the double-digit millions in the new broadcasting centre. Qvest Media, a global systems architect and technology consultant for broadcast and media technology, was responsible for the technological planning and subsequent system integration. One of the company's areas of expertise is the implementation of innovative media technology system landscapes. For their ambitious project Sky only considered the best technology currently available on the market. It was no coincidence that German manufacturers Guntermann & Drunck were chosen to provide the KVM technology.

Challenge

Qvest Media also took over the audio-visual equipment of the two large live studios, the connected control rooms, the many editing rooms, ten dedicated voice-over booths and 16 additional voice-over seats. In addition, Sky Sport HQ has eight production control rooms and an Occasional Channel Playout Room with a connected Audio Control Room as well as two TX Control Rooms for controlling the four 24/7 main channels and ten Occasional Channels. An impressive 2.5 m high and 35 meters wide LED wall forms the heart of the main studio where game scenes, analyses, graphics and statistics can be evaluated and shown. Best-of-breed technologies in every area support Europe's largest and most modern broadcast infrastructure for live sports broadcasts.

Solution and technical implementation

To ensure that the entire equipment runs smoothly and around the clock, high availability, reliability and redundancy were essential for those responsible for the project. That's why they chose G&D KVM products for the broadcasting centre's IT infrastructure, since they serve as the backbone of the entire IT system and make it possible to remove computers into a central server room.

In order to optimally implement the high demands on security, redundancy, workflow facilitation and collaboration of the individual production teams for live reports, Qvest Media developed a concept to create a fully redundant structure of the production and operating computers which also included removing them from studios, control rooms and post-production. Two completely mirrored, redundant matrix switch clusters, each consisting of a ControlCenter-Digital 288, were installed in the central equipment room to provide redundant access to the various user and computer modules of the individual systems. If – in the event of a fault – switching via one of the two matrices is not possible, the second matrix is used automatically. Thanks to full redundancy, the production teams can perform their tasks at all times.

To integrate the two existing matrix switches – two DVICenter DP64 – as an extension of the system, G&D's matrix grid function was used. The function enables the bidirectional communication between systems and ensures optimal connections across the entire installation. This allows users bidirectional and more flexible access to the computer technology and helps individual production teams work together across departments thus making them more flexible and improving the collaboration for live reporting.

Central server room

The central equipment room houses around 100 high-performance computers, which play their part in ensuring that the Sky programme runs around the clock. All systems such as ingest servers, video servers, studio automation servers, servers and clients for graphics systems, teleprompters, servers for camera robotics, general configuration servers/clients and servers for broadcast automation are now separated from their users who are still able to access them using KVM technology. In order to make the equipment available at the various studio, control room and producer workstations, which are often distributed over several rooms, Qvest Media used CPU units and CAT cables to connect the computers to the central matrix switches. VGA, DVI and DP computer modules were

used to harmonize the heterogeneous computer landscape. The integrator installed all modules as “UC variants” to ensure a redundant connection to both ControlCenter-Digital matrices.

Priority was given to single-head CPU modules, but some dual-head units were applied especially for the machines in the ingest work area since the staff in this area require their workstations to have two displays. For keeping the racks as clearly arranged as possible, Sky Sport counts on various G&D device carriers as well as MultiPower-6 and MultiPower-12 power supply units for power supply.

With around 5.2 million customers, Sky Deutschland GmbH is one of the largest entertainment companies and pay TV providers in Germany. Its 24/7 programming primarily includes live sports programmes, feature films, children’s programmes and documentaries. Especially the live sports broadcasts about football, Formula 1, tennis and golf are extremely popular.

Workstations and their technical equipment

In order to facilitate the creative work in Sky’s broadcasting and production centre and to make it as collaborative and efficient as possible, all video and programme control rooms as well as ingest, playout, the graphics department and several studios are now almost computer-free. Access to the remote equipment is carried out via KVM technology from G&D, whose receiver modules (CON units) for DisplayPort and DVI were installed at the workstations. To create multi-monitor workstations, the single-head CON units were bundled in pairs.

And although most of the equipment has been stored centrally, some departments still need to be able to access their computers locally while some producers needed to access several computers. The first issue has been solved with installing KVM switches, e.g. DP-MUX2, at each of these workstations.

Producers, in turn, are now able to use TradeSwitches to operate several computers with only one set of keyboard and mouse, without having to provide keyboard and mouse for each machine separately.

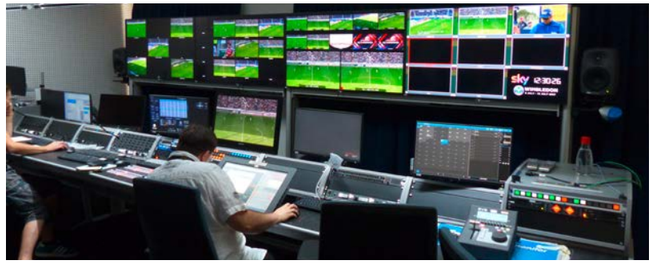
The result of the demanding IT installation and several months of technical preparations is really impressive: About 100 CPUs and 85 CONs and countless cables were connected to both mirrored matrix switches.

As the icing on the cake the KVM matrix ControlCenter-Digital has been integrated into LAWO’s VSM broadcast control and monitoring system to ensure uniform control and to simplify multi-level, complex processes. Thanks to G&D’s IP-Control-API, the VSM controller communicates with the KVM matrix and can execute any switching commands such as simultaneous switching of different programme requirements or exchanging setups between several control rooms.

Customer benefit and outlook

With their own production and broadcasting centre, Sky Germany gain maximum flexibility and above all even more freedom for future in-house productions. Individual workflows have been improved, making everyday production easier for everyone involved. Removing the equipment into a central server room has significantly reduced the noise levels in studios and control rooms as well as the maintenance requirements for IT administrators. “The installed equipment has met our expectations and is easy to use“, summarizes Michael Büttner who is responsible for IT/KVM at Qvest Media.

The future of Sky remains exciting. Europe’s largest pay-tv provider continues to grow and is committed to the credo of offering its customers the best entertainment. Well, with the best technology available on the market, Sky is well equipped for the future and for further growth in Germany.



Partner

Qvest Media is a world-leading systems architect and ICT integrator in the fields of broadcasting and media technology, specializing in the television, media and telecommunications industries. The company provides comprehensive know-how for the planning, implementation and technical support of media technology infrastructures and relies on state-of-the-art products from world-class manufacturers in order to always be able to offer their customers the best possible solution.

Challenges

Harmonizing the IT landscapes in an optimal way – different computer types, signals, systems and various broadcast equipment had to be integrated into the overall concept, taking into account a wide variety of requirements by direction, editing, production and post-production.

The technical equipment needed to be as modular and scalable as possible

Highest demands in terms of design and functionality

Highest demands in terms of reliability, redundancy and productivity

Result and benefits

- One of the most modern sports broadcasting centres in Europe
- Best-of-breed technologies for efficient workflows
- Maximum options for growth and expandability through modularity and scalability

G&D Equipment

KVM matrix:

2 x ControlCenter-Digital 288

KVM Matrix-Grid™

KVM-over-IP remote control

Matrix peripherals:

Various DP, DVI and VGA CPUs

Various DP and DVI CONs

Other KVM devices:

MultiPower

DP-MUX

TradeSwitches

G&D IF IT’S KVM

Qvest Media smarter broadcast solutions

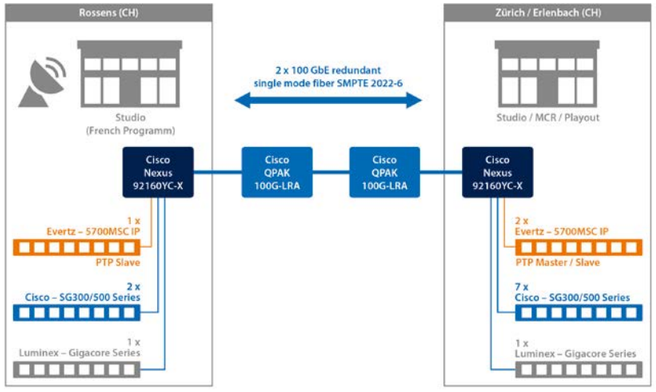
NEP SWITZERLAND PIONEERS 4K/UHD AND IP-BASED REMOTE PRODUCTION

Swiss broadcasting service provider NEP Switzerland mobilises two 4K/UHD OB trucks and IP-based remote studio production

Changing production requirements have seen broadcast service provider NEP Switzerland significantly expand its production facilities. Two 4K/UHD trucks have joined its fleet to serve the MySports TV channel, and a new studio and playout complex has been established in Erlenbach/Zurich, with a satellite studio opened in Rossens for coverage MySports' coverage of the Swiss ice hockey National League among other programming.
As a direct result of this investment, NEP Switzerland now operates the most modern IP-based 4K/UHD remote production studio in Switzerland. System integrator Broadcast Solutions was responsible for the planning and execution of all of the projects.

Streamline OB truck UHD-41 and UHD-42

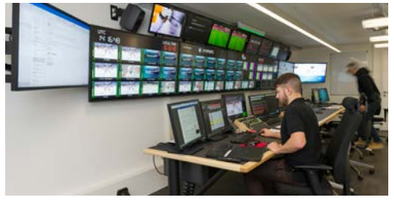
The move saw NEP Switzerland double its mobile 4K/UHD production facilities just in time for the start of the 2017/2018 season of the Swiss Raiffeisen Super League (RSL) broadcast on Teleclub – all league games are now produced in 4K/UHD. Commissioned 2017, the UHD-42 4K/UHD truck is an example of Broadcast Solutions' Streamline OB van family, and is equipped with two control panels to support productions requiring up to 10 cameras. A year prior, Broadcast Solutions had supplied NEP Switzerland with its UHD-41, a 4K/UHD OB truck that is also primarily used in the production of the Swiss RSL. NEP Switzerland currently produces 144 RSL games in 4K/UHD, and 180 Brack.ch Challenge League games in HD for Teleclub Sport each season.

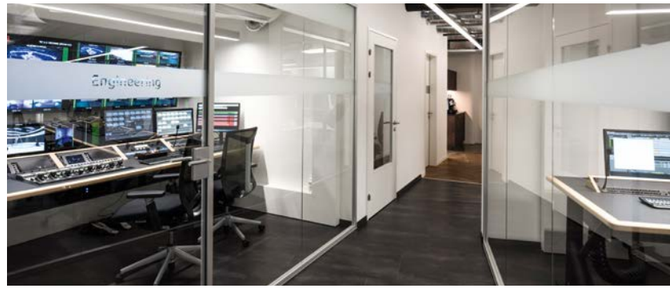


The setup uses Swisscom's 10GigE fibre infrastructure, with which all RSL stadiums are connected. Via this dedicated line, signals are sent to the Teleclub broadcasting and production centre in Volketswil. The production of the RSL 2018 season opening game from Bern's Stade de Suisse exemplified the flexibility of both UHD-42 and UHD-41.
UHD-42 operates using the Two-Sample Interleave format (4x 3G/HD/SDI), which has advantages in production of the RFL because the HD-signals is always included. Intercom signals are on HD-feeds, as the trilingual production requires many channels of the UHD-feed to be used for commentary – the OB truck sends two UHD feeds and four HD feeds into the network, and receives a single UHD-feed and two HD-feeds from the other games. The connection to the fibre-optic network is made using via a Nimbra fibre stagebox from Swisscom Broadcast. In order to use this setup, the 2SI signals are converted into the Square Division format and sent to the stagebox via four conventional BNC cables per UHD-feed. The stagebox system – transported to every match by NEP Switzerland – converts the signal to JPEG 2000 with 4x 400Mbit. The setup ensures consistent cable lengths on the BNC side and offers tremendous cost advantages on the infrastructure side. It has been used in the production of all matches since its introduction.

MySports Playout Centre - Remote IP-based production and playout

In mid-November 2017, MySports relocated its headquarters to a former factory in Erlenbach, near Zurich, to manage all of its programming. MySports' output is produced and broadcast with bilingual commentary, with the French-speaking editors, presenters, guests, commentators and using the satellite studio in Rossens 200km away. The two studios are linked via a "geo-redundant" fibre-optic connection, with the complex in Erlenbach remotely controlling the Rossens facility.
Occupying an area of around 1,000 square metres, the 4K/UHD studio and playout complex in Erlenbach has the capacity to handle 20 channels simultaneously, including two channels in UHD. Currently there are four 24/7 channels (Free-TV and Pay-TV, each in German and French), as well as 14 event channels (seven Pay-TV, each in German and French), which can be used as required, e.g. be played with games taking place simultaneously. In addition to the UHD-capable studio, the complex contains four control rooms (including the Remote Studio) with joint video control, the MCR with separate audio MCR, the Playout Centre, three editing suites and six commentary rooms. In Rossens there are two further editing suites and six commentator rooms as well as the main studio.

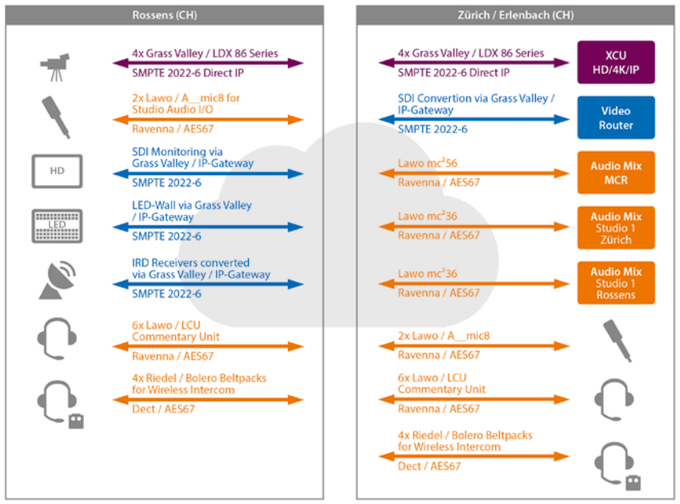




The design of the video infrastructure included a conscious effort to adopt a hybrid solution based on baseband signals supplemented by IP-gateways wherever practical and needed. For example, in Erlenbach there is a Grass Valley NVision router for all video signals, but the connection between the Rossens' outdoor studio and all stadiums is exclusively via IP.
On the audio side, the IP-based Ravenna network is used both within the site and across all sites, with their many intercom panels and a Riedel Bolero system connected via AES67. In this way, proven and reliable baseband technology is combined with the flexibility and expandability of newer IP technology.
All incoming feeds are first translated into "house format" using Riedel MediorNet MicroN network devices – this includes audio shuffling and de-embedding of the audio signals. The intercom signals, which are partly embedded in the feeds, can be routed via the Audio Core to the Riedel intercom. For outgoing signals, the MicroN units are used as audio embedders.
Central control of all components is via Lawo's Virtual Studio Manager (VSM). From the MCR all lines are switched, and ingest is controlled from here. The Audio MCR is responsible for the assignment of commentary booths and the routing of the intercom lines.
Two large and two small control rooms are available for studio productions. The large control rooms each have an outsourced audio control room and are assigned to the studios in Erlenbach and Rossens – although this assignment can be changed. The two smaller control rooms with integrated audio workstations can be used flexibly for other applications, e.g. for small interview situations. Recording and playback are via EVS XT4K servers, which are operated via EVS LSM Connect control panel and touchscreen. For the graphics, a Novo XL UHD system is used for both the live graphics and the LED wall.
Image control is housed in a separate room and handles control of all eight cameras, control of the two robots, and lighting control for both studios. A Phabrix UHD Rasterizer is used for full-resolution image control.
The audio control rooms are equipped with Lawo mc236 mixing consoles with 5.1-channel surround monitoring. These have access to the studio signals as well as to individual commentary booths.
The identically-equipped studios in Erlenbach and Rossens each have four Grass Valley LDX 86N cameras, one of which is mounted on an Areplus Robotics ARCAM camera robot with a 4 m track. The studio background

consists of a 21 m-wide LED back wall. In-ear monitoring and microphone operation is provided by Sennheiser wireless equipment, which is connected to the audio core via Lawo A__Line stageboxes.
The commentators' booths are designed to accommodate two commentators, and each is equipped with one Lawo Commentary Unit (LCU) which can be routed to any audio room or the MCR. One of the commentary booths also has the option of dubbing in any combination with one of the three UHD-capable editing suites.
For every German-language studio broadcast, a French version is simultaneously produced in Rossens – this requires a small number of local technical personnel, as most of the work takes place in Erlenbach. However, the French-speaking editors are on-site. Also, the French-language contribution is created in the two cutting rooms. The signals from the six commentator cabins in Rossens go directly to the audio router in Erlenbach, and are mixed there with the associated live signal for playout.
The UHD cameras are powered by Grass Valley Direct IP technology, with both CCUs and RCPs located in Erlenbach. This setup allows the cameras in both studios to be controlled from a central image control room. The studio lighting can also be controlled from Erlenbach by DMX control signals relayed via IP to Rossens where they are there converted back to DMX (DMX-over-IP).
The ARCAM system combines a six-axis motion control arm with a 4 m-long rail, with complete control is via IP, so that individual camera movements can be driven directly via the video mixing panel in the production control. For all video signals exchanged between sites, an SDI-IP conversion is performed by Grass Valley Densité IP Gateways.

On the audio side, the Ravenna network, built in the playout centre, will be expanded via the WAN and the studio stageboxes will be directly connected. The LCU commentator units are also in the Ravenna/AES67 network and can be addressed directly from the audio rooms. The wireless intercom system is based on Riedel's Bolero. For this purpose, several DECT base stations are connected to the intercom matrix via AES67.
The second location is also used for backup and disaster recovery. All storage is duplicated in Rossens and kept permanently in sync so that – in case of a major failure of the primary storage servers – all content is held here. Two backup playout servers are also located here, having access to the storage content. The playout servers output a backup version of the 24/7 channels and signals are transmitted to Erlenbach via the IP-Gateway. In the event of a failure of a 24/7 playout server in Erlenbach, the on-air signal automatic moves to the backup playout from Rossens.
Two motorised downlink antennas are installed in Rossens to provide MySports with up to six downlink channels. The antennas themselves and the IRDs are remotely controlled via IP, and the output signals transmitted to Erlenbach via the IP-Gateway.



To ensure smooth data transfer between the two sites, they are connected via a 100GBit network with very low latency. The two fibre-optic routes take different paths through Switzerland for geo-redundancy. Both sites have Cisco Nexus switches with 100GBit uplink and 10GBit downlink ports. Cisco SG-300 switches are used to connect less bandwidth-hungry devices. Clean synchronisation in the network is essential, and provided through the PTP protocol. The PTPv2 Grandmaster clocking uses an Evertz MSC5700 SPG located in Erlenbach, which distributes sync over the Nexus switches as a boundary clock. Two additional SPGs are available as backup – one in Zurich, one in Rossens.
The full connectivity of the production via IP offers NEP the ability to integrate further remote productions very simply, as was the case in the production of a recent Formula E race in Zurich. There, a remote set with four cameras, Lawo stageboxes and LCU unit was installed on-site and connected via IP to the Playout Centre. As a result, it was possible to manage production from the control room as usual.
MySports' implementation of state-of-the-art broadcast and IT technology, as well as the connection of its two studio locations via a high-performance network and their capacity for remote production, are unique in Swiss broadcasting.

TELEFÓNICA OB's UPGRADED WITH BROAMAN REPEAT48 WDM-12

Spanish broadband and telecommunication giants Telefónica, S.A have become the latest broadcast multinational to invest in BroaMan's unique and scalable signal conversion technology over fiber.

The company's subsidiary, Telefónica Broadcast Service, provides services for other companies (as well as themselves), handling production, transport and management of all TV content. Their department also handles outside production of TV events, in particular sports and other news related programs, for which they operate a fleet of OB vans. These include a 16-cam truck with six EVS, and two 15-camera trucks with four EVS each. Their flagship HD van handles Spanish UEFA Champions League.

Technical manager of the production department is Carlos Rojo, and it was he who authorised the investment after seeing BroaMan's product portfolio at IBC 2017 in Amsterdam.

"We were looking for an inexpensive, easy and reliable way to transport multi SDI 1.5G video through just two optical fibers when we came across BroaMan," he said. "We were looking to add facilities to our trucks in order to speed up the time preparing our productions. We used to have six hours in which to go live with basketball and handball, and we have to ensure a complete absence of errors."

ECONOMICAL AND RELIABLE SINGLE-FIBRE CWDM SOLUTION

Pioneers and experts in fiber Infrastructure. BroaMan have been creating and shaping highest quality fiber networks and point to point solutions for more than 25 years.

The beauty of BroaMan's solutions, Carlos said, is that they only pay for what they need. "The price and flexibility to be able to configure the system the way we needed was a huge benefit. It means we don't have any features that we won't use."

Before committing to the purchase they took a demo system of the Repeat48 WDM-12 for evaluation — and to ensure it fulfilled the requirement. "We were concerned about CWDM technology over our field fibers and the possibility of video jitter," admits Rojo. "On many occasions we connected very long BNC cables to the device and it passed all our tests without problem."

The Repeat48 WDM-12 would have been perfect for their needs. The series represents an application engineered, electrical-optical-electrical media conversion for 3G/HD/SD-SDI or AES10/MADI signals. It converts video or digital audio between coaxial and optical connections. This particular device features 12 video channels combined over built-in CWDM module — with all channels transported to another location with single duplex fiber. It also connects to a Route66 device to offer additional I/O in remote locations. And since BroaMan products comply with SMPTE standards, they can be used with third party equipment.

As a consequence, Telefónica ordered three identical sets — each running point-to-point — based on BroaMan's Repeat48WDM 12-channel device. The Repeat48 at one end is equipped with 8-In, 4-Out, and on the other end 4-In, 8-Out — and each device pair is connected via just one duplex single-mode cable. "This is now used to broadcast ACB Spanish National Basketball League," confirms Carlos Rojo. "It was for this that we needed the solution."

In operation, three Minicam, two fill, key graphic signals and a clock cam are sent to the OB truck and in the other direction two program returns and a clock signal from the field. "Sometimes we will need to use existing fixed installations, because some stadiums are pre-cabled, and as we don't have many fibers available, we will use the Repeat48 fiber tunnel to send an audio Dante channel."

In other words, via two fibers they can send the 12 video channels and 64 audio channels in a very elegant and simple way. "Previously we would have been unable to send so many signals with just two fibers," notes the Telefónica man. "This also enables us to save time and problems with connections."

The new BroaMan upgrade will provide Telefónica with enormous flexibility. In addition to the ACB Spanish National Basketball League they can also broadcast Handball Spanish National League; Football Spanish National League; Football UEFA Champions League; Basketball Euroleague and Bullfighting.

Summing up, Carlos Rojo says, "The great advantage [with theRepeat48] is that the ability to send so many signals through a single fiber means not only that we have many more spare fibers, but we also reduce the set-up by more than half the time. In certain situations we just have one or two fibers available but we can send everything we need.

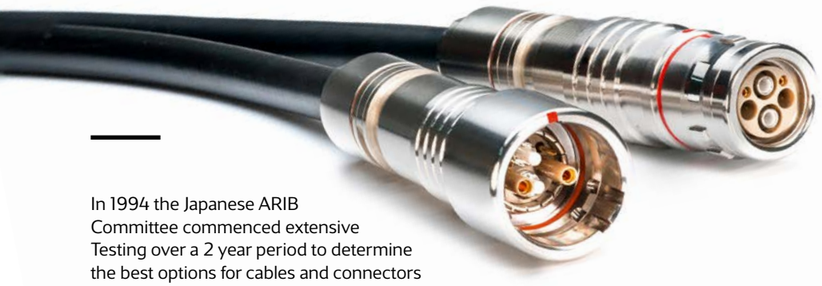
"It is also important and reassuring to know that this always works, and the reliability of the system means we can focus our attention on other areas. There is no doubt that CWDM technology offers us an extremely reliable way of sending so much info and data.

"The investment is certainly not high when you compare it with other technologies, and the advantages that it offers more than warrants the investment."

Finally, he says, while the device was easy to set up and use, they valued the support and advice provided by Maciek Janiszewski, BroaMan's Applications Engineering Manager.

BroaMan.com

Evolution of HDTV Interconnection Systems



In 1994 the Japanese ARIB Committee commenced extensive Testing over a 2 year period to determine the best options for cables and connectors standards in anticipation of the countries switch to HDTV broadcasting.

Four connectors and tree cable manufacturers products were thoroughly tested to evaluate the best connector and cable combination for system requirements and outside broadcast environments. Additional requirements were excellent EMC properties, smaller size than common triax to more closely match the size of the of the new hybrid cables and a very strong connection between cable and connector that would be able to survive the abuse to which cables can be subjected in these applications. An example of the demanding tests was the 500 mating cycle dust test, which only one connector passed. The connector design that met all the requirements is the LEMO 3K.93C range.

LEMO connector system fully proven in demanding environments

With over 20,000 of these connectors in use the LEMO 3K.93C connector system has proven itself in many different applications from studio and stadium installations to regular OBVan use. The system has increasingly been used at all Olympic events starting with Atlanta in 1996 and the Nagano Winter Olympics in 1998, right through to the recent Winter Olympics in PyeongChang and the FIFA World Championships in Russia.

Manufactured in stainless steel, the 3K.93C connector incorporates the highly reliable LEMO push-pull latching system and is suitable for up to 20,000 mating cycles and above. With proper termination the fibre contact is also suitable for this level of endurance.

New design, less components

Now LEMO launches a new connector for inter connection of HD video cameras in the professional broadcast industry. The new hybrid connector called 3K.93C.Y is fully compatible with existing SMPTE and ARIB standard. This recent LEMO design has less components allowing easy assembly and reducing the termination costs for the hybrid fiber optic connector. Furthermore, this new product has been engineered to be more tolerant of operator variations and therefore performance can be more easily optimized during the termination process. It includes a new contact called the FS fiber contact. The connector can be easily identified with its new shell design and fiber optic contact shape.

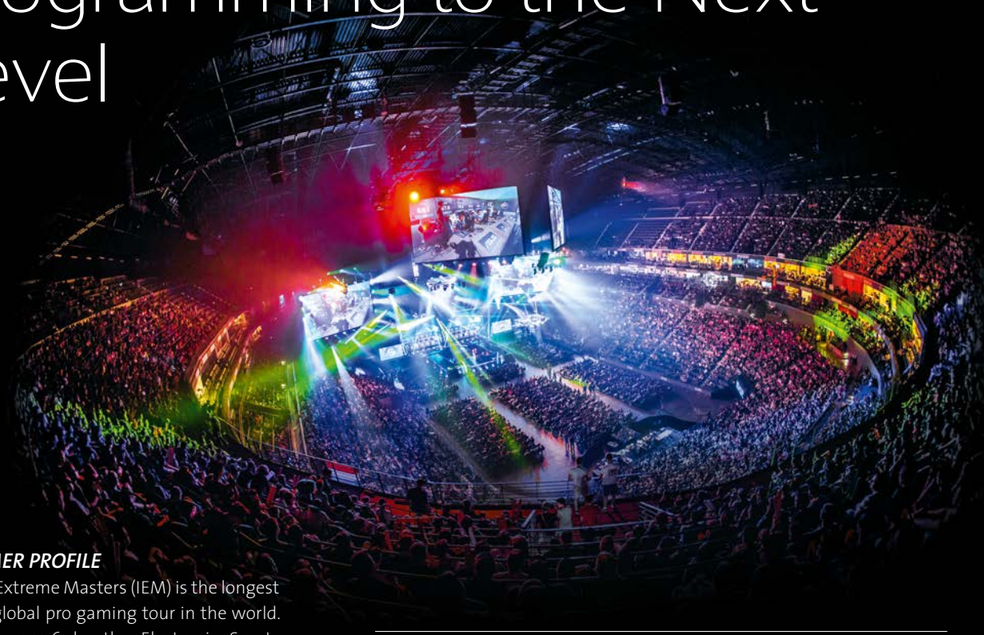
The LEMO 3K.93C.Y connectors with keys (W), ideal for blind mating, were developed to meet the critical requirements of the new generation of digital HDTV cameras.

The main features of this series are as follows:

- Security of the LEMO Push-Pull self-latching system
- Fitted with the new LEMO Fs fibre optic contacts.
- Conforms to the Japanese ARIB technical report BTA S-1005B, to the SMPTE 304 standard and to the European EBU Technical Recommendation R100-1999.
- Qualified for use in UL approved equipment such as those specified in UL 1419 <<Professional Video and Audio Equipment>>.
- Cabled connectors have obtained the EC Attestation of conformity No: N8 00 03 39058 001 from the German TUV Product Service.
- The 3K.93C.Y series consists of eight models which will accept cables specific to this application.

A quality termination service is offered by LEMO to ensure that the resulting cable assembly is to the highest standard and suitable for use for the demanding environments experienced within the Broadcast market. As well as standard plug-socket assemblies, special requirements can be easily accommodated. Both optical and electrical tests are carried out on each and every cable assembly prior to dispatch.

Using EVS Technology to Take ESL's Live Esports Programming to the Next Level



CUSTOMER PROFILE

The Intel Extreme Masters (IEM) is the longest running global pro gaming tour in the world. Started in 2006 by the Electronic Sports League (ESL), the competition features the world's best gamers playing in several events. IEM Season 12 featured events in Australia, China, the US and South Korea and culminated in the IEM World Championship, held in the 11,500-person capacity Spodek arena in Katowice, Poland. In the finals, CS:GO and StarCraft II were played and featured a combined prize pool of over $950,000.

THE CHALLENGE

Esports tournaments have huge online audiences of informed, passionate and engaged fans watching live programming and interacting with IEM's well-subscribed social channels. These followers are technically-aware and expect a certain level of quality. Consequently, they interact with their chosen events in a different way to those of traditional, linear television-centric sports. They're an audience of digital natives who consume huge amounts of content and communicate through social media interactions of memes and GIFs.

In addition, with the nature of internet-only delivery and the pace of many of the games being played, the speed of program production is very important. "During a live esports game, anything three-minutes old is forgotten," said Simon Eicher, Executive Producer at ESL. "Our live programming and our social media content is what engages the fan base. Therefore, we need to be reactive, creating and delivering these supplementary assets as quickly as possible."

While continuing to put out this high-quality programming, esports stakeholders like ESL and Turtle Entertainment (ESL's owners) are also being challenged to attract new kinds of fans. To broaden its reach, ESL has evolved the live programming of the IEM events to feature similar elements to those in television sports. Pre- and post-game programming,

half time shows and expert punditry are now staples of ESL's events. While appealing to a wider audience, ESL ensures that it's still putting out content that engages its existing fanbase.
As with any sport or event that's continuing to grow in popularity, ESL is under constant development of its programming to meet these requirements while making sure that its product appeals to potential advertisers. As a result, ESL decided to put in place a more professional-grade production workflow to enhance the live programming it delivers to fans.

THE SOLUTION

Moving beyond the production technology it was previously using to a more professional live workflow, ESL's goal was to build a production infrastructure that enabled it to output the highest-quality content it could, as quickly as possible. To do this, ESL put in place a range of EVS technologies for the live production of the IEM and uses the same workflow for the ESL One tournament productions. These technical facilities include XT4K and XT3 live production servers, MultiReview, IPDirector, XFile3 and the DYVI live production switcher.

In-game third-person replays

ESL and EVS partnered to develop esports' first in-game live SuperMotion replays – creating output similar to what would be delivered to fans watching any football or basketball game.
Perfect for ESL's first-person shooter games, third-person replays are created by placing observer PCs into the game, which view the action as if it were a camera. Feeds from these are recorded in the PCs' native 120Hz and ingested by the EVS server. Managed by an IPDirector content management system, replays created with LSM remote control panels are slowed down to the broadcast-standard 60Hz – outputting a half-speed replay with completely smooth playout and absolutely no loss of frames.

Live program switching

ESL uses an EVS DYVI switcher with two panels during its IEM productions. One panel is used for cutting together the live play output from the gamers' PCs and the other for the live programming, letting them avoid having to deploy two separate switchers. DYVI is built on a IT/software-defined architecture, so it's completely customizable. This means ESL can create a program setup within DYVI for each of the games played at any given tournament. Then as live production begins, the TD can instantly recall the games' configuration with the press of a button and begin cutting together a program without any unnecessary delay between events.

Fast content publication

To quickly output highlight packages as well as GIFs and memes to its online platforms, ESL utilizes EVS' MultiReview application. Nicknamed the 'meme-machine' by the production team at ESL, MultiReview gives them a synchronous view of all feeds ingested by the servers so that they can easily select relevant content and create clips that are quickly turned into memes and GIFs.
The speed of the MultiReview tool is perhaps one of the most important elements of ESL's workflow. "The content on our social platforms has to be published as quickly as possible," said Simon Eicher, Executive Producer at ESL. "With this in place, we're able to distribute packages of content to ESL's social channels – from ingest to delivery – in less than a minute."

RESULTS

With its high-end professional technology workflow in place, ESL can create better live content that's much more competitive alongside traditional sports. In creating more engaging esports tournaments for the IEM, it's not only continuing to connect with its existing audience, but also appealing to a new kind of fan.
"Esports' fan base is growing with programming for tournaments like the IEM now being created to engage audiences using features similar to many other sports," said Simon Eicher, Executive Producer at ESL. "Our programming now appeals to much more casual viewers, engaging those who now watch games like they do any other live sporting event."
A better-quality product and economical production processes also makes esports tournaments like IEM much more attractive to sponsors, which is key to ESL's continued growth. "Deploying professional processes like we have with EVS technology has allowed us to simultaneously improve our live output while seeing a reduction in production costs because we can work much more efficiently," added Simon Eicher, Executive Producer at ESL. "It's these kinds of improvements to esports programming that will allow us to continue growing the sport to wider audiences."

KEY BENEFITS

INDUSTRY-FIRST REPLAYS – ESL and EVS have put in place an esports Industry-first replay workflow that outputs broadcast-style live action highlights

SPEED OF PRODUCTION – with its EVS Workflow ESL can publish content packages from it's live events within a minute of something happening in-game

CONFIGURABLE WORKFLOWS – DYVI lets ESL preconfigure the setup of its events, switching between games' configurations at the press of a button

HIGHEST-QUALITY CONTENT – with the popularity of esports continuing to rise, ESL uses its professional live video workflow of EVS equipment to create the rnost engaging live content for audiences

WIDER FAN ENGAGEMENT – improving the overall quality of its live out putwith EVS technology means ESL can deliver a product that appeals to much wider audiences and to potential sponsors

EVS

intel EXTREME MASTERS ESL

HOW ES BROADCAST IS DELIVERING BROADCAST SYSTEMS WITH THE USER AT THEIR HEART

Systems integration and broadcast equipment supply specialist ES Broadcast reveals how it is supporting the whole spectrum of live production, thanks to the company's user-focussed approach and the diversity of its bespoke systems integration capabilities.

Whether upgrading facilities to UHD, expanding production capability to meet the ever-growing demand for live content, or taking a leap into the unknown as you move your business into today's hugely diverse and fast-paced broadcast arena, utilising a skilled and experienced broadcast systems integrator can be the difference between trying to cobble together myriad pieces of complex equipment yourself, or getting a bespoke solution that not only meets your current needs but also factors in potential developments in the future.

Whatever your business goals, ES Broadcast's expert systems integration team is able to work in partnership with you to ensure the solution we deliver is an exact match for your needs, giving you the capability, flexibility and scalability that you need for any live production job – from trucks to PPUs to studios.

A wealth of experience in delivering OB vehicles

ES Broadcast's expertise in delivering cutting-edge outside broadcast vehicle solutions stems from the huge range of experience of the systems integration team. Having built more than 200 vehicles, ranging from Sprinter-sized six-camera DSNG vans up to double-expanding, 16+-camera OB trucks, our expert systems architects have amassed a vast amount of knowledge, skills and practical know-how in designing customised vehicles.

The award of a new contract challenged horse racing broadcast services provider RaceTech to significantly increase their outside broadcast capabilities. They turned to ES Broadcast to design and build three 16-camera HD OB trucks, which went into production in summer 2018 and are due for delivery by the end of the year.

Central to RaceTech's brief was a requirement to closely match the layout and functionality of their existing OB trucks. It was important to them to retain familiarity for their operators across the entire fleet of vehicles. Coupled with that was the need for a very flexible production space – or rather, the trio of production areas that are key to RaceTech's service offering for clients. Their trucks not only provide live feeds for broadcast, but are also used to provide on-site coverage for race-goers, and for footage for race stewards, so that they can monitor each race.

At the same time as retaining the familiarity of their existing fleet, RaceTech also wanted to ensure that the new trucks offered them the ability to tailor the set-up for each individual job.

"RaceTech wanted the new trucks to slot seamlessly into their existing operation," explains ES Broadcast's Technical Director, Jonathan Lyth. "But we also felt there was room to improve their technical capabilities, and to tweak the vehicle layout a little.

"That's not about compromising on the finely honed functionality of their existing production operations, but about making things even smoother for their operators, as well as factoring in some flexibility, so that they can adapt their production workspaces to exactly meet the needs of each job."

To that end, ES Broadcast chose a TSL Tallyman control system for the vehicles, which is highly adept at allowing reconfiguration of the router system with just a few operations. Paired with the trucks' core Grass Valley NV8140 router systems, which offer 144x144 inputs/outputs, as well as multi-viewer capabilities, the Tallyman offers the simplicity and flexibility of router control that RaceTech's brief required.

Meanwhile, the use of Ross Carbonite vision mixers exactly matches the client's existing set-up, with a Ross Mira video server, Trilogy Gemini talkback system and Yamaha DM1000 audio mixer adding powerful capabilities to the vehicles.

"ES Broadcast's systems team really listened to our needs when it came to designing the new trucks for RaceTech," says John Bance, Head of Project Management at RaceTech. "The fact that they put our operational needs as the focal point of their systems design makes me confident that the vehicles they deliver will be the precise solution we need to meet the demands of our clients as we grow our business."

No compromise on live events with hugely flexible HD and UHD flyaways

Designing and building portable production units is a staple in the skill-set of ES Broadcast's systems team. Our wide-ranging experience allows us to scope precise solutions that are custom-designed to meet the specific needs of the end-user.

With clients in the sports, entertainment, exhibition and corporate sectors, being able to offer cutting-edge UHD technology was of paramount importance to Creative Technology's ongoing business development. They turned to ES Broadcast to help them expand and upgrade their specialist AV services with four UHD-capable portable production units.

Close collaboration with the client – as well as a flexible approach to the solution design – was imperative to delivering units that truly enhanced CT's live production capabilities, explains Chris Williams, Projects Director at ES Broadcast.
"CT were keen to retain the familiarity of the system architecture of their existing PPUs, so that their engineers could easily transition between new and existing units," says Williams. "So our solution mirrored the logic of the Grass Valley Kayak 1080i systems they already had in operation, but incorporated technology capable of 1080p and UHD live production.

"Regardless of the vision mixer [the four PPUs use different switchers], what sits at the centre of the system design for each flyaway is a Ross Ultrix FR2 UHD routing platform. This offers full Demux/Mux, frame-syncs, multiviewers and UHD gearboxing. The router is then controlled by TSL's Tallyman control system, which we've found gives us maximum flexibility and simplicity of operation."

As well as being UHD-ready, the new systems also needed to offer expanded audio capabilities. This was achieved using the Demux/Mux and Madi Core of the Ross Ultrix router.

As you'd expect with PPUs, keeping the units compact was essential to ensure the portability and flexibility CT needed to quickly and easily adapt the live production rig according to changing client needs. Fitting the amount of hardware required into a pair of 26U frames was certainly a challenge!

"We're really pleased with the PPUs ES Broadcast have built for us," says Sid Lobb, Head of Vision and Integrated Networks for Creative Technology, "especially given the lengths the team went to, to meet what was a very tight deadline for delivery of the first two units. And our clients really like them too – the flyaways have already been used for high-profile product launches, international exhibitions and UK music tours."

Spectacular studios that are stunningly simple to operate

With live production rapidly evolving to meet the needs not only of traditional broadcast but also online and OTT channels, adaptability is crucial to any new studio design. But that shouldn't mean any compromise on the quality of your production – with viewer expectations higher than ever before.

Improved production values, simplicity of operation, and bringing production in-house were foremost in the thoughts of online casino and gaming/gambling company Gamesys when they engaged studio builder Spectrecom and systems integrator and equipment supplier ES Broadcast as partners to deliver a purpose-built three-stage studio complex.

Gamesys needed the design of the studio floor to allow them to utilise any combination of the three studio spaces – a 480sqm main studio, and two smaller green screen studios of 100sqm and 85 sqm. This flexible layout, combined with the stunning set design, would give them the ability to stream up to eight live casino games via their UI, all with a premium casino ambience.

"The need for flexibility extended not simply to the design of the physical layout, but also to the underlying system design," says ES Broadcast's Chris Williams. "So each studio has its own gallery, powered from a single CAR. But with a simple configuration switch, they can be combined into one studio, controlled from a single control room – and even by a single operator, if necessary."

The requirement that the studio could be operated by a skeleton staff with minimal broadcast training, without compromising on production value, led ES Broadcast's systems team to select equipment and design custom control systems that enabled a single operator to run macro actions at the push of a button.

"Gamesys aren't a traditional broadcast client. Their brief for the project stemmed exclusively from their operational and production requirements," explains Williams. "So our challenge as the SI was to use our range of experience to design a studio system that removed the steep learning curve for a team that was new to broadcast, but which was also completely scalable, to allow for the inevitable growth that will follow."

ES Broadcast chose Ross products for the studio build, including PIVOTCam PTZ cameras, Carbonite switchers and XPression Prime graphics engines, as well as Ross routers. "Ross products are highly integrated and very flexible," explains Williams. "They're very complex underneath but also have this wonderful ability to deliver these really simple touchscreen systems." All this contributed to a studio complex which is well-matched to the skillset and goals of the client, but which is also robust, highly flexible and scalable in the future.

"Throughout the design of the studio, ES Broadcast were fully engaged with listening to Gamesys' needs as a company with limited broadcast experience but significant ambitions," says Ged Cleugh, Director of Film and TV at Spectrecom, the company which led the project to build the new studios from scratch. "Their broadcast systems experts were able to guide the client along the right path. They have delivered a studio facility that richly fulfils Gamesys' business goals of producing really high-quality content without overstretching their budget, headcount or technical expertise."

Carrosserie Akkermans,

Coach building at its best

Oud Gastel is only an hour's drive from both Amsterdam and Brussels airport. This small village has been the hometown of coachbuilder Carrosserie Akkermans for more than two centuries. Founded in 1811, the family business is one the most reputable coachwork companies in the Netherlands, if not the world.

The first thing you notice when you arrive on the premises is the activity in and around the enormous modern complex. Dozens of police cars, defence vehicles and ambulances are being built by equal numbers of skilled professionals. OB-trucks are also an important part of their product range; Akkermans can modify or upgrade an existing vehicle or if the budget allows manufacture large

trailers from scratch. "Alongside Medical, Police, Defence vehicles and mobile command centres is Broadcast and Media - one of our specialities" says Arjan Akkermans CEO, and the 8th generation to work in the family business: "With more than 150 OB trucks built, only a few companies in Europe can match our track record."

In the early years the company mainly built wooden carts, wagons and carriages. Around 1920 the first ambulances and hearses were built for the municipality of Amsterdam starting with only a chassis from a car manufacturer. After the Second World War, car manufacturers started to supply the superstructure on the chassis themselves and Akkermans had to specialize. They did this by focusing on police, fire, defence and medical vehicles. As a result of their rich history, the craftsmanship and the high quality, the company has subsequently built up a very reputable clientele in the broadcast industry too.

"We started building OB trucks in the late 1980s", says Akkermans: "Dutch public broadcaster NOS requested some custom made Mercedes Vario vans. They ordered six vans from Mercedes: three to be converted into OB vans and three to be used as utility vehicles. Since we already had years of experience with building vans for, the police, fire brigades and ambulance services, we got the job. We were commissioned to construct both the interior and the vehicle subsystems, aircon, power distribution.

The vehicles were well received and so these initial six vans became the first of many more over the coming decades. Today we build OB's, audio, SNG and other media trucks in all shapes and sizes for various countries. We focus on three worldwide segments: Western Europa and Scandinavia, China and the Middle East. and have recently also built trucks for Bangladesh and Myanmar, so you could say that whole world is our territory.

Carrosserie Akkermans is more than proud to hold the honorary title of 'Purveyor to the Royal Household in The Netherlands'. H.M. Queen Beatrix awarded this title to Arjan Akkermans in 2011, during the celebration of the Carrosserie Akkermans' 200th anniversary.

During King Willem I's reign (1815-1840), the 'Purveyor to the Royal Household in The Netherlands' was awarded to only a few enterprises that delivered goods to the Royal Household. After King Willem III's coronation in 1849, the title was given a wider interpretation and the actual delivery to the Royal Household was no longer a condition.

Starting with construction of the coachwork, we continue with the interior furniture and the manufacturing of the technical racks. This is combined with integration of the vehicle subsystems aircon, power, alarms, and control. To provide the customer with a "rack ready" vehicle ready to accept their equipment.

All these activities are managed in close cooperation with the end customer be that a system integrators or vendors such as Grass Valley and Sony. I am proud to say that we have great relationships with the best system integrators and vendors in the business – developed over many years partnering to deliver increasingly complex vehicle solutions.

Carrosserie Akkermans has approximately 45 full time employees and each of them has specific skills. We are able offer our customers the total package, from 3D design where the detailed specification is agreed, to wood workers, metal workers, electricians, upholsterers and all-round coachbuilders who all take pride in ensuring all vehicles leaving the premises are built completely in accordance with clients' specifications.

Sustainability

Sustainable working has been important for Carrosserie Akkermans for many years. The company was the first in The Netherlands to be certified for "Sustainable Bodywork". This quality mark is an initiative of CarrosserieNL (formerly Focwa - Carrosseriebouw) and the Sustainable Repair Foundation. Certified companies have to meet strict requirements and comply with a structured framework. To be successful in the long term you have to produce sustainably "We have been working as sustainably as possible for many years. Because care for the environment has been a core value in our family for decades. We use sustainable and recycled materials wherever possible and also ensure that our products can be dismantled in an environmentally friendly manner. And for several years now, full electric and hybrid vehicles have become increasingly important in our offer".

Trends in outside broadcast vehicles

Arjan: "We realise that the demand for outside broadcast trucks is changing, but not declining. The broadcast technology that we use in vehicles is changing, becoming lighter, smaller and more energy efficient. The trend towards remote and IP-production has freed up floor space and this is being used to accommodate more people and more workplaces. Space for 20 to 30 people in one truck is no longer an exception. More video is produced than ever before and digital transformation is in full swing. A new type of customers is engaging with us and they want to use OB trucks for IP distribution. The industry is really changing and we are changing with it."

Tailor made versus standard design

The diversity of the Carrosserie Akkermans product range and our experience with a varityof end users, combined with an extensive product knowledge of materials and systems makes us the perfect partner for any business.
Arjan: "Our extensive experience has taught us, what is the best and most efficient way to design and build a broadcast or video vehicle. We have extensive experience of air conditioning and climate control systems, we understand the challenges of expanding side vehicles and ensuring that every piece fits perfectly. We want to share this knowledge with our customers. You can opt for a 100% tailor-made product, or a 'standard design' with limited adjustment options. We provide 'templates' for our customers, so they can choose, from a small van to a huge trailer or anything in between, with one, two or three expanding sides or none at all. We work exclusively with the best system integrators and manufacturers, and only with those who have proven to meet our standards."

www.akkermans1811.com

CARROSSERIE AKKERMANS SINDS 1811

THE BBC HAS A LONG AND RESPECTED TRADITION OF COVERING LARGE SPORTING EVENTS AND HAS CONSTANTLY REFINED AND IMPROVED ITS COVERAGE OVER THE DECADES.

HAVING WORKED FOR THEM FOR 35 YEARS, LEAD SOUND SUPERVISOR DAVE LEE HAS GAINED A WEALTH OF EXPERIENCE PLANNING AND DELIVERING THE SOUND AND COMMUNICATIONS OF A WIDE RANGE OF TV PROGRAMMES.

Taking advantage of remote production: the audio challenge

Today, remote production is increasingly used to help deliver more content, to more screens, across more devices; and it is proving a key challenge for modern broadcasters.

The case for remote production is compelling. Remote production reduces our carbon footprint, it maximises utilisation of existing studio equipment at the home location, it keeps quality high and keeps costs low; and the staff can work in a well-established and familiar production environment that's close to home. Since the start, sports broadcasting has been central to the growth of remote production. Manufacturers and broadcasters have had to work together to overcome some fundamental challenges. In the broadcast audio world, the biggest challenge is how to combat latency; not of the overall transmission signal, but the live on-air conversations between reporters, presenters and experts at the remote venue(s), as well as in any remote studio.

These are relatively new problems for broadcast workflows. The traditional way to cover large international events is by driving an outside broadcast truck to the event, setting up flypacks, or building a transmission suite on site and mixing the entire event locally. As broadcasters begin to embrace the concept of remote broadcasting, they are finding that with careful planning they can maintain quality levels while at the same time save money. Remote broadcasting cuts travel budgets, saves on shipping and equipment, and gives more time to staff. It maximises a broadcaster's investment in existing studio architecture, increases content across a variety of delivery methods and allows broadcasters to be more creative with content. But such things come at a cost and the challenges are something that broadcasters haven't had to deal with before. BBC Sport's Dave Lee has been central to the development of remote production for the organisation.

Lead Sound Supervisor Dave Lee at work

"Latency is absolutely key to any live sports production - the main consideration being the talent hearing what they need to hear to do their job properly. They need to hear a combination of things: mainly instructional talkback information from the production team plus the programme into which they are contributing – a mix minus themselves. They must be able to talk to one another – presenter to commentator to reporter and so on. This involves a lot of bi-directional audio traffic."

It may surprise many that BBC Sport has been embracing remote production for many years: for example, the Vancouver 2010 Winter Olympics and again in Sochi 2014. Lee explains, "We had a very small team on location in Sochi with all video and audio sent via International connectivity back to the UK for transmission. The majority of the production and technical team members were located at BBC Sport in Salford, where we have our state-of-the-art transmission suites."

Lead Sound Supervisor Dave Lee at Gold Coast Games

When audio engineers mix live TV content, they combine local content at base where the transmission occurs, such as video from servers, audio play-ins and studio content; with a number of outside sources. The OS remote contribution from the venues generally includes Commentary, Presentation and Reporters; and often involves physical studios at the remote venue too. These outside sources must hear the programme into which they're contributing. To achieve this, broadcasters use a mix minus feed for every outside source. Some ground-based staff also need specific programme mixes that includes their own voices, for example, when Presentation is stationed in a noisy environment such as amid an enthusiastic and vocal crowd.

The various mixes can all be adversely affected when working remotely.

Traditional mix minus working is forgiving and successful when dealing with small latencies, because people at the venue are not hearing (echoes of) themselves. If this latency doesn't affect the flow of conversations between contributors, then everything is good. But as soon as you move into remote production, with its inherent higher latencies, the conversations start to suffer. This was exactly the challenge that BBC Sport encountered in Sochi – as have other broadcasters working in remote production environments.

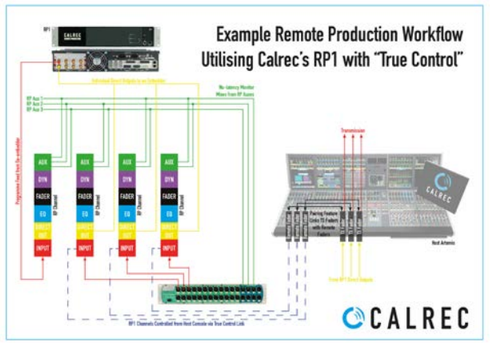
Lee explains, "In Sochi we did use remote production successfully. However, whenever any onsite talent needed to talk to any other onsite talent, that traffic came over our international links, through the UK sound desk and back out on the mix minus to the other talent. They replied and then that came back to the UK, through the sound desk and back out again to the other talent. This torturous signal path introduced a considerable amount of latency, a combination of multiple international round trips plus video encoding/decoding (with the embedded audio). It all adds up to a significant delay."

This results in slow hand-overs, laboured conversations and interruptions, which can be particularly confusing and frustrating for viewers when presenters and reporters who appear at the same venue exhibit a significant delay. "They are all within metres of one another, but there's a delay because they hear each other via this international latency. We had to find a way of making this better," says Lee.

Calrec and BBC Sport have a longstanding relationship, most recently from using Calrec consoles and Hydra2 networking technology at Salford. After Sochi, meetings were held to exchange ideas about how to eradicate remote site latency. It was concluded that the talent on the ground inevitably needed to hear the UK talkback and UK programme content via the international link – mix minus all OS contributors – but also be connected locally to one another to negate the international latency. That was the technical nut to be cracked.
Traditionally, this could be achieved by having a physical mixer onsite at the event. The Eureka moment came when it became clear that this system works – why change it? What's required is the ability to achieve a local mix of dialogue, but control this remotely.

This collaborative working resulted in Calrec's RP1 remote production unit, which sits at the remote venue. The latency challenge is simply solved by providing local DSP channels for mixing the venue audios locally, along with switched talkbacks and mix-minus-all-venues added to each contributor's mix. The nature of the remote control aspect is fundamental, with fader data generated by the transmission sound console in the UK sent via an international IP link.
At a big event like the Commonwealth Games, broadcasters will have technicians at the venue during set up, before they connect with the team back home. This is an aspect which needs careful consideration. Configuration and basic operation should be possible 'offline' to test the system; and also to provide a redundant back up should there be technical connectivity issues later on. For this reason, control of the RP1 can be local (via a web-based GUI), but once set up local control can be locked.

Remote Location: Olympics at PyeongChang



The transmission audio engineer takes control and 'blocks' the use of fader and cut facilities of the GUI controlling the remote RP1. The same content that is put to air in Salford is also mixed within the RP1 so the talent hears precisely what's going on. The talent hear each other via local connectivity in real time when they are faded up. These faders mirror the host console faders in the home production facility, as the host console controls the RP1 onsite.
Lee explains, "We can now treat audio content generated in the UK, which is behind-time, separately from the instantaneous audio content generated locally. Anything that's available on the event side of the latency, the talent only hears through the RP1 remote mixer; it doesn't pass to the UK and back." Of course, this scenario applies to any production suffering from delays, not just international events.

Calrec's RP1 solution was successfully deployed at both the Winter Olympics in Pyeongchang and the Commonwealth Games in the Gold Coast, Australia.
But then consider a studio at the remote venue; remote talent might want a full programme mix in their earpiece rather than a mix minus, so that the Presenters and Guests can hear each other clearly. "When there's ambient noise, foldback and a lot of talkback traffic, the talent can't always hear what's going on around them - even people sat next to them!" Lee says, "You have to feed the studio mics into the contributors' ears. The latency must be zero to avoid echoes of themselves and the people they can half-hear sat next to them."

So how can zero remote studio latency be achieved?
Lee says, "There's nobody mixing the mics locally in the studio, but in remote production that's ideally what's required. We can liken these mix requirements to those of a foldback mixer at a concert enabling each performer to hear clearly. The requirement is for the mic mix generated at the studio to be controlled remotely by the host console back in Salford."
For every mic in the studio there's a fader on the remote mixer GUI – the RP1 – that's controlled by the equivalent fader back on the console in Salford. Whatever decision the broadcast audio engineer makes is mirrored within the remote RP1 mixer. However the audio content used in the RP1 is direct, not via any international link. The audio from mics that are fed into the RP1 are also sent to the host console over the international circuits. This allows the broadcast engineer to control the main output mix and the local venue mix at the same time. It is one, fully integrated solution. The RP1 studio faders are paired with and follow the transmission faders, so Presenters and Guest hear almost exactly what viewers hear.

BBC SPORT

HUNAN TV RELIES ON GENELEC FOR CHINA'S FIRST DOLBY ATMOS EQUIPPED OB TRUCK

Renowned for its pioneering approach to programming and the use of new technology, Chinese broadcaster Hunan TV has created the first Dolby ATMOS equipped OB truck in China, complete with Genelec monitoring

Having transformed itself culturally and economically in less than three decades, China now stands as an example to follow when it comes to the adoption of new technology – including within its enormous broadcasting sector.
Despite having only emerged in the last 30 years, the Chinese television landscape nonetheless accounts for a third of the world's viewers. Now those increasingly affluent households will have the opportunity of experiencing new immersive content courtesy of the first Dolby ATMOS capable outside broadcast vehicle in the country, with Genelec monitoring at the centre of the set-up.

Roughly 2,500 television channels are presently broadcasting to China's half-billion television sets. Most have long lived in the shadow of the national broadcaster CCTV (China Central Television). Among the most successful of the newcomers, however, is Hunan TV, which quickly set itself apart with a pioneering attitude and string of ratings hits. As a result, its holding company, Hunan Broadcasting Group, has become the second-largest television broadcaster in China.

Building on its success by focusing its schedule on youth and entertainment content, Hunan TV has now established an important benchmark with the launch of the first OB truck in China capable of producing Dolby ATMOS 5.1.4.

Although a significant step forward in and of itself, the arrival of the truck comes as part of a broader strategic plan that was made clear at the recent China Content Broadcast Network (CCBN) exhibition, which took place in Beijing in March 2018. During a busy press call at the event, Andy Sherman, EVP, General Counsel & Corporate Secretary for Dolby Laboratories, Inc. and Jianwei Zhou, Supervisor of the Science and Technology Committee of General Director of the Major Project Center for Hunan Broadcasting System (HBS), jointly signed a declaration of intent stating that the broadcaster is committed to producing premium television content in the Dolby ATMOS format.

The launch of the OB truck arguably marks the first step in delivering on that commitment – a step which sees it join a growing number of international broadcasters for whom the adoption of immersive audio in the home is a growing priority. Having made its name in cinema screens around the world, ATMOS has at last begun to transition into the living room. An increasing number of mainland Chinese broadcasters have begun to adopt multi-channel surround formats for large variety shows, sports events and concerts – Hunan's pioneering investment will likely inspire its competitors to follow suit and make the jump into an immersive future.

To do so, they will have to overcome the same challenges that Hunan TV faced in the creation of its new OB truck, not least the required linearity and ability to overcome the strict requirements of the ATMOS format, including tight restrictions in loudspeaker positioning.

Accepting that challenge on behalf of Hunan TV was leading Chinese systems integrator NDT Group, whose Long Hongliang worked closely with Hunan TV Recording Engineer Tan Xijie on both the design and integration of the truck's audio systems. "This project represents a major milestone for Hunan TV, as well as a significant step forward for Chinese broadcasting and perhaps even the Asian broadcasting sector as a whole," he explains. "There could be no compromise on quality or the equipment chosen – everything had to be the best."

With the great and the good of the regional industry watching carefully, Hongliang and his team were faced with the combination of extremely high expectations, and the physical limitations of the truck itself. The interior of the vehicle is split into four distinct zones: the main mixing area, the broadcast area, equipment cabinets, and storage. The vehicle's constrained dimensions meant that optimal locations for each and every monitor in the 10-unit setup – especially the surround and top speakers – were simply not technically possible. As a result, it was difficult to maintain an identical monitor radius to attain ITU standards.

With room inside the vehicle at a premium, it was also unrealistic to apply any more than a limited amount of sound isolating treatment without further reducing the available internal space. In its untreated form the vehicle suffered from an imbalance of midrange and low frequencies, leading to a boomy sound, and the risk that inaccurate sound reproduction might mislead a mix engineer's ears. Having considered his options, Hongliang soon realised that the best solution was Genelec Smart Active Monitoring (SAM™), using GLM software and AutoCal to calibrate an optimal listening environment.

Now the main Pro Tools equipped mix area contains a 40-fader Stagetec Aurus console, running an audio signal distribution matrix of 4,096 channels, surrounding which is a network of Genelec monitors forming the 5.1.4 environment. For the main front left/centre/right speaker locations, Hongliang looked to Genelec's recently launched range of ultimate point source three-way coaxial monitors, The Ones, selecting three 8351A enclosures as the heart of the monitoring set-up.

The largest of The Ones range, the 8351A combines a number of Genelec technologies including Acoustically Concealed Woofers (ACW), Minimum Diffraction Coaxial (MDC) driver and Directivity Control Waveguide (DCW). The result is a dramatic reduction in harmful reflections matched by highly controlled directivity over a wide bandwidth. Ear fatigue is thus substantially reduced, meaning engineers can listen for longer.

Occupying the left and right surround positions within the truck's set-up are precisely mounted 8240A two-way monitors, offering high SPL and broad bandwidth in compact enclosures. In addition, four 8320A 4-inch two-way monitors are installed out of sight in the vehicle's ceiling – with an enclosure depth of less than 6 inches, the monitors are easily contained within the roof space.

Adding a solid sub frequency foundation for the expansive audio format are two 7260A powered 10-inch subwoofers, which with their high SPL and versatile bass-management system made them the ideal low-end companion. Crucially, the entire system is SAM compatible, equating to a network of monitors which can be quickly adapted to suit the needs of the engineer. Via GLM, users can switch between monitor configurations and surround formats at the touch of a button – from simple stereo to surround and all the way up to ATMOS.

NDT Group also used GLM to confront the inevitable limitations on the physical positioning of speakers. The OB truck's dimensions couldn't be altered, but Genelec's AutoCal technology, part of GLM, provided the best possible solution.

By using the factory-calibrated Genelec 8300 acoustic measurement microphone in concert with AutoCal software, the systems integrator was able to quickly and accurately compensate for issues such as inconsistencies in each monitor's time of flight, ultimately creating a fully calibrated listening environment that worked with rather than against the truck's limitations.

With its potential for steering the way forward for China's booming broadcast community, it is perhaps only fitting that the completed OB truck has been cheerfully decorated to symbolise a theme which translates as simply "Happy China". Nor has the innovation been limited to the audio set-up – a central control system has been implemented for the quick and simple configuration of lighting and air conditioning, with different preset scenes available at the touch of a key. Now on the road primarily serving Hunan TV's live music and variety show content, the finished truck is reason to celebrate both for the broadcaster and NDT Group.

"I'm confident that the implementation of this Genelec monitoring solution and Dolby ATMOS within the new OB truck will prompt and inspire many more creative ideas within the Chinese broadcasting community," reflects Long Hongliang. "It is a strong example of what we can achieve and it is already greatly adding to the quality and breadth of audio production within our television programming. Most of all it creates the opportunity for a wealth of new media content. We expect that the newly equipped OB truck will participate in a large number of large-scale live production broadcasts in 2018 and beyond."

SENIOR RECORDING ENGINEER OF HUNAN TV AS WELL AS THE PROJECT MANAGER OF THE OB VAN, **LONG HONGLIANG (RIGHT),** RECORDING ENGINEER OF HUNAN TV, **TAN XIJIE (LEFT)**

GENELEC®

The Wireless Camera Solution

Live images from wireless cameras are an important part of many broadcast and event productions. Service providers such as HDwireless are specialized in such high-frequency video radio transmissions. With the project-specific "wireless camera solution", the company from Mechernich near Cologne, Germany, offers the right technology for every dimension of video radio. For more extensive projects with wireless cameras, HDwireless has created its own mobile HF production unit.

Production vehicle HDwireless RF1 as a video radio interface

"The HDwireless RF1 concept stands for reliability and flexibility in RF video transmission."

HDwireless RF1 is designed as an interface between wireless camera systems and a broadcaster's OB van or video control room, for example for event productions. All RF signals converge in the production vehicle. In addition to video images, these signals can include signals for camera control as well as any data or radio signals for on-site communication with the director and team. The technology processes the incoming information and provides camera signals via cable, for example via fibre optics. The RF technician on board has complete control over all signals and processes via RF receivers, displays and RF measurement technology. Short vehicle set-up times allow a high flexibility of use. With the mobile production unit, rapid location changes are very easily possible – as is the case when it comes to sports events, which last several days. All of the vehicle's technical components are optimised for reliable and fast operation – up to the 12-metre high antenna mast, which is ready for operation within a few minutes.
"The selected and compact equipment in the HDwireless RF1 allows the realisation of RF productions with up to 16 wireless camera systems in HD and 4k."

The air-conditioned vehicle is based on a Mercedes Sprinter and optimised for outside broadcast applications. It can connect wireless camera systems, RF signal processing/control and RF frequency monitoring with the imaging equipment designed in a consistent 3G-SDI standard and for 4k environments. Monitoring occurs using UHD displays from Sony. The RF structure is equipped with multiple RF distribution units and "RF over fibre" solutions, so that up to 16 wireless camera systems including camera control can be processed in parallel via the signal and process structure. The RF1 offers full camera control for Sony, Ikegami and Grass Valley camera systems. Integrated network, intercom and fibre optic systems enable simple, fast and trouble-free connection to the production environment on site. The high antenna mast is suitable for static antennas and for the HDwireless GPS antenna tracker system, which greatly increases the RF range of antennas for mobile transmitters.

"One HF production vehicle and a lot of camera combinations."
The requirements for wireless camera transmissions differ considerably. Hence, the pool of RF-capable systems in HD and 4k resolution with Sony, Ikegami and Grass Valley camera heads must be correspondingly diverse: studio cameras, hand cameras, steadicams. These are fully compatible with the HDwireless RF1's "Wireless Link System". A fundamental distinction must be made between integrated solutions and add-on technologies. Side panel solutions are available for Sony camera heads, in which the transmission technology is located in the side cover. For fibre optic or TRIAX-bound cameras, the transmitter can be used within a few minutes without the need to update the camera's software. For RF use as a studio or handheld camera, the only visible differences are the additional antennas for video transmission and camera control. The Grass Valley INCAM-G wireless camera system provides a fully integrated solution for the Grass Valley LDX series. As an alternative to these solutions, add-on transmitters can be connected to the camera head using a mounting plate. The camera and transmitter are powered using "power through the line" technology via the camera battery, which for example allows Steadicam wireless cameras to be as handy as possible. For high-resolution video transmissions, HDwireless HCAM is available as a new 4k wireless camera system for live image transmission to the RF1 mobile production unit.

The most recent example of an extensive wireless camera transmission using the HDwireless production vehicle RF1 was "Schlager, Stars & Sterne - Die Schlossparty in Österreich" with Florian Silbereisen on June 2nd, 2018. Commissioned by the German public broadcaster Mitteldeutscher Rundfunk, HDwireless ensured extensive video radio transmission in Kitzbühel, Austria. Several wireless cameras were used for the primetime live show broadcast on Saturday evening on public TV stations ARD and ORF – including the very lightweight HDwireless ULC EVO2 Steadicam system. The cameras' live images were received via remote antennas as a network-based ASI signal and were transmitted to the RF production vehicle via fibre optics. The transport stream's decoding was ensured by the RF1's technology from where video signals were then transferred to the OB van. In addition to video radio transmission, HDwireless was also responsible for the communications radio, which was provided via the vehicle's transmission technology.

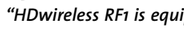
CEO Patrick Nussbaum on the deployment of his HDwireless team: "We planned and implemented the wireless camera transmission in close cooperation with the MDR. Among other things, a remote camera on a neighbouring golf course had to be included, which provided live images of a helicopter landing. For the transmission of all signals, reliable transmission with stable video signals from our RF1 was ensured."

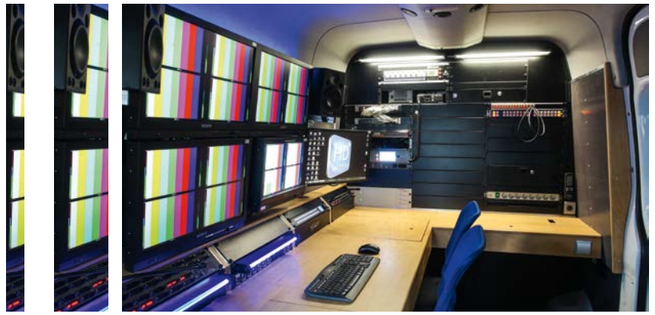
"HDwireless RF1 is equipped with the latest wireless systems for complete control of all wireless cameras."

The wireless cameras' control functions are connected to the RF production vehicle via radio so that each camera can be fully controlled. The transmitter transmits the control signals from the production vehicle to the cameras in the frequency range between 435 and 490 MHz, while the control hardware on board can be controlled via Ethernet. The operator can thus either work in the RF1 vehicle itself or control the cameras from an OB truck. In the latter case, the connection is ensured via a data cable connecting the OB van to the RF1.

"In the end, all radio frequencies converge centrally here in the HDwireless RF1."

Every frequency that is used in the course of a production and that is received by the RF production vehicle is measured, analysed and processed. RF receivers indicate signal strengths and qualities. Is each wireless camera system sending perfectly decodable signals from its assigned work area? Is the signal strong and stable enough in time for processing? Are the registered and licensed frequencies free of interference? The RF technician in the HDwireless RF1 analyses and evaluates all these questions and aspects with the help of control displays and measurement technology.





For each project, the task is unique and depends on factors such as the size and topography of a broadcasting area or on the nature of a location. The project-dependent RF concept determines the antenna setup. Often, antennas are not only located on the production vehicle's mast, but also at remote positions with ideal reception positions – for example on buildings or elevations. Remote antennas are conducted loss-free over longer distances with the so-called HDwireless RFiber connection via fibre optics. Depending on the production, the RF1 also receives signals from established antenna networks. FC Bayern Munich's championship celebration at Marienplatz in Munich, Germany, on May 20th, 2018, is an excellent example of the HDwireless RF1's effective RF production structure. During this production, several RF radio tasks were performed using the RF1. The production vehicle's antenna technology received live images from the various wireless cameras located on the square, in the town hall and on its balcony as well as via a radio link from the church tower of St. Peter. Additionally to the live images, the audio signals from the presenters' microphones were received via the RF antennas on the vehicle's high antenna mast. The complete communication radio, including recording manager and directional radio, was also handled from here.

"It's an obvious choice to use the RF1's potential at the production site for communication radio as well."

The RF production vehicle's infrastructure includes the integration of communication using Clear-Com FreeSpeak II at 1.9 GHz and 2.4 GHz. This way, radio network plots can be set up for the desired application area from the vehicle. Using fibre optics or network cable, the wireless intercom area can be extended to many square kilometres. Typical radio tasks also include the transmission of presenters' microphones. For the championship celebration in Munich, this meant a complete supply of the presenters micros' radio transmission with the return transmission of the sound mix N-1 on the one hand and the supply with the communication radio for direction, recording management and team on the other hand. During the production in Munich, the radio coverage included the city hall, Marienplatz, the TV compound and the more distant church St. Peter. For this purpose, HDwireless used Clear-Com FreeSpeak II and digital Motorola UHF radio cells.

"An all-in-one solution with many options for RF transmission."

The importance of wireless camera transmissions for broadcasting is constantly increasing. At the same time, the demand for complex and demanding implementations requires high-quality and reliable RF solutions. An important component is the HDwireless RF1 as the central interface for high-frequency transmission of all types of radio signals during TV productions and events. Patrick Nussbaum sums up: "The customer benefit is the reliable and stable provision of all desired output signals, from video and data to on-site communication – even in large broadcasting areas."

The HDwireless profile:

HDwireless is a developer, manufacturer and supplier of wireless camera equipment for professional broadcasting, offering a product portfolio consequently oriented towards the quality standards and norms of this demanding industry. HDwireless offers a complete system of high-quality components for signal transmission for sales and rental – from video transmission technologies and receivers to matching accessories and special solutions. To meet the requirements in the field of equipment rental, HDwireless offers extensive dry-hire equipment with 24/7 support. The HDwireless project team around Patrick Nussbaum meets individual or complex customer requirements. As a production engineer with more than 20 years of experience, Nussbaum is considered to be one of the most recognized German specialists in the field of wireless technology for broadcast and events. On request, customer projects are supported with planning, special solutions and on-site service.

HDwireless's range of services is rounded off by frequency coordination from official frequency allocation to frequency monitoring at the event location using RF measurement technology. HDwireless's headquarters are based in Mechernich near Cologne, Germany, with additional offices located in Baden-Baden and Munich.

Your contacts at HDwireless:

Patrick Nussbaum
CEO
patrick@hdwireless.tv
+49 (0) 2256 9590 269

Frank Dawert
Project management/acquisition
frank@hdwireless.tv
+49 (0) 2256 9590 269

www.hdwireless.tv






A Short review on Outside Broadcast Systems history in China

The build-up of an Outside Broadcast (OB) systems in China started from the requirements to cover events like sports, concerts, ceremonies and others. A good OB system is like a TV station just working on field no matter where is, and which could meet any needs for TV production if its live or live on tape. The OB system can be integrated in different form, such as in big truck or in various flight cases. As the events become more and more bigger, the requirements for the coverage have become more and more complex, the OB systems have been designed more sophisticated and professional. In addition to the main production van, more vans with dedicated functions come into operation where each van has its focused character, like slow motion replay, CG and virtual, Assistance vans, up-link vans and so on. Usually they work together like a group of trucks during the coverage.

In China the first OB van had been built in 1958 following the foundation of the first TV station named China Central Television (CCTV). Later on there were more OB vans in China owned by CCTV and a few local TV stations. At that time the production to cover events was very simple and the OB vans were simple too. Usual only one OB van was used for a live production with 3-4 cameras only and without recording equipment until 1970.

A more widely use of OB vans for one event in China dates back to 1990 for "Asian Games" in Beijing. More than 10 OB vans joined together for the live coverage of the Games. Each OB van was not only equipped with 6 camera channels but also had replay and slow-motion capabilities by tape and even CG were on board for the generation of the starting lists and the timing results. The first sizeable Fly Packs (called EFP in China) came to the Chinese market in 1996 when CCTV build up two sets of EFP system which were combined together for live coverage of "the handover ceremony of Hong Kong returns to power". This was a very important event in China and in the whole world. More than 100 EFP OB systems from all over the world flew in to Hong Kong for the live converge of the event.

The early years of OB systems in China needed to cope with a limitation of skilled technical people and a limitation of reliable and simply to operate equipment. Therefore, the design of the OB systems and the definition of their production capabilities were mainly described by the number of available cameras. When Beijing was awarded the Olympic Games 2008 OBS (Olympic Broadcast Services) started to evaluate the available OB systems not only by the number of cameras but also on other production capabilities like size of the routers, audio mixers, size of the intercom, flexibility of the monitor wall and the flexibility of the working area including available seats. OBS classified the available systems in A, B, C to meet the different needs of such a big event. This gave OBS a clear picture of which Chinese OB systems could be used for some of the various sports of the Olympics and how many OB systems OBS needed to hire in from around the world. So functionalities and flexibilities to meet the productions requirements become more important concept and principle on how to build up Ob systems or we say production platform.

Except technical elements, some of customers start thinking beyond just technical specifications. Production teams are using OB systems as a kind of "art program creation machine", therefore they need to find a way to integrate people into a technical working environment. "How to hiving those steel, non-vitality machines full of humanity?" - "Giving a soul to our new OB van comes the main focus of Liaoning TV" commented Xuan Wang, chief engineer and director of technical center. Liaoning TV has put their thoughts into their design when they started to plan and to build their new "12+2+2+6" cameras system (Trucks + EPF. Based on: Round/Circle and Square theme, they designed inside the square truck a lot of circle elements. As a circle just reflects the core element of Liaoning TV logo, such all circles go through the whole truck from technical area all way to shading area, production zone down to audio area. With a soul, the nonlife machine becomes full of life (See the Liaoning truck on page78).

From technical viewpoint the OB system evolved from analog to digital and then moved to HD, now 4K become next technological wave. While the copper-cables on the move to more fiber-cables, SDI now start to move to IP. SMG (Shanghai Media Group), one of biggest local broadcasters, started their OB business by importing OB systems from BTS/Germany, in early days, later on they update the system to SDI and HD. SMG is always looking for new technologies and a pioneer in 4K production. Their first 4K truck was delivered at the end of 2015 with 4 wire technology, then they got many opportunities to produce in 4K, including the Winter Olympics in Korea (see the SMG truck on page 122). Now they just finished their first IP, 4K, HDR system (OB Van plus EFP) which is capable to handle up to 50+ pieces of cameras and enjoys the flexibility to fit in any size of 4K or HD production requirements.

Those are only two examples in China, meanwhile each year many HD and 4K UHD OB vans are build up around the whole country. Beside input of coach builders from mainly Europe, many TV stations are more using local coach builders, after many years of experiences, local coach builders also have become stronger and the quality is getting better and better with modern designs. Now Looking around the world, Telecom Companies could provide more and more bandwidth and remote production becomes a reality. Companies which are capable to handle IP technologies are again starting to think new ways.... It seems OB vans will become carriers for cameras and its accessories. But this had not yet happened in China yet up to today, but it is very interesting to see when it will become true.









Author: Liming FU, Managing Director of AXON digital design APAC

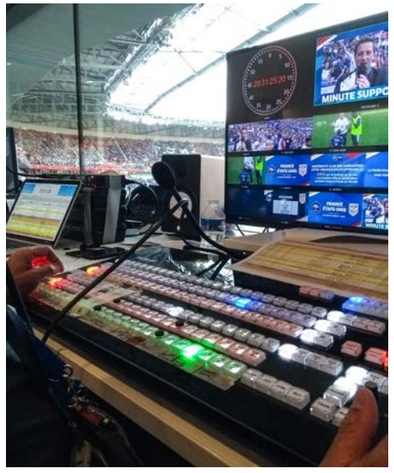
Sincere thanks :
Mrs. Baining Jiang, Duty-chief committee of OB department of CSMPTE
Mr. Xuan Wang, Chief engineer and Director of technical center. Liaoning TV
Mr. Moon(Yue) Yuan, Vice Director, TV OB Department, SMT


PARC OLYMPIQUE LYONNAIS CHOSE LIVEXPERT PRODUCTS TO MANAGE PERIMETER LED SCREENS

Parc Olympique Lyonnais, also known as Groupama Stadium, was opened in January 2016 and is the new home of Olympique Lyonnais football club, one of the most popular clubs in France. Since its inauguration, the stadium was a host of UEFA Euro 2016, and was also chosen to stage, among other important events, the 2018 UEFA Europa League Final and football at the 2024 Summer Olympics.

Within the 50 years of its existence Olympique Lyonnais, or simply OL, became a real brand. Its activity goes way beyond football. The club has a charity foundation and its own TV channel. The company OL Images was born in 2005 with the creation of OLTV channel. The channel broadcasts nationally via satellite and Internet Boxes. OL Images manages audiovisual media for OL: the giant stadium screens, stadium IPTVs, website videos and the stadium app. The company has a large field of work.

"We manage pre- and post-match animations, like the sound system and the scenic lighting. We also take care of videos that the sports staff needs for sports analysis, adversary analysis, sports performance and recruitment. My team has also supported the creation of the OL Museum by providing content and maintenance," says Nicolas Houël, Olympique Lyonnais Technical Manager (OL IMAGES, OLTV).



The company took a big turn moving to Groupama Stadium. Previously working in 720x576 SD format, the arrival at the new stadium allowed them to go HD and broaden the horizons.

"Before we used Pinacle DEKO 500 character generator and a Panasonic mixer," comments Nicolas Houël. "For many years I have been watching the evolution of NewTek products. I remember the first TriCaster with analog inputs. I was rather skeptical about the reliability of a mixer fully integrated into a PC, but I must say I am impressed by the number of products installed and working and very few negative returns." Integrating the Groupama Stadium was a big project for OL Images. They were looking for the equipment dedicated to football, especially for scoring, the system capable to manage the giant screens, perimeter LED panels around the field, lighting effects with automatic lyres and stadium lighting for shows and team presentations, the music of the animations. They needed future-proof system as the market migrates toward a fully IP-based environment.

NEWTEK AND LIVEXPERT, THE WINNER COMBINATION

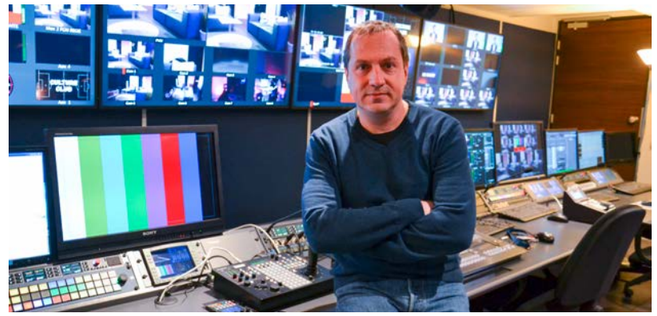
"The challenge was to integrate everything. Obviously the arrival of NDI was a real advantage and allowed us to significantly increase the studio's scalability to accommodate the company's growth plans," confides Nicolas Houël. 3D Storm, the authorized distributor of NewTek products and owner of LiveXpert brand of the tools for live video and sports production, had just the perfect solution and OL Images decided to invest.

The new TriCaster TC1 and LiveXpert Delta-stadium were integrated in the main control room. The OBVan mobile unit was equipped with a TriCaster 410 and LiveXpert LiveCG Football and covers other football fields.

TriCaster TC1 is the latest addition to the TriCaster family, launched at NAB 2017. It's a solution for IP video experience for live production, with support for 4K UHD switching, live streaming, recording, data-driven graphics, virtual sets, social media publishing and more. TriCaster TC1 supports 16 external inputs of up to 4K UHD 60p resolution without sacrificing functionality. Powered by NewTek's NDI™ technology for IP-based workflows, TriCaster TC1 also offers multiple studio-grade Skype TX channels for adding remote video guests to live shows.
LiveCG Football is a professional scoring and graphics management application for NewTek TriCaster, the most complete and affordable tool designed for TriCaster and 3Play, for live broadcasting and for displaying figures and graphics in real-time on large screens in football stadiums. The powerful database engine of LiveCG Football gives the ability to store information about all the games: teams, countries, leagues and championships. All-important data, such as players' names, coaches, referees, players' pictures and team logos, are stored once to be easily used again, each time a new game is being broadcasted. LiveCG Football features an editor to create and customize all stills and animated graphics according to a defined branding. LiveCG Football provides a full set of templates covering all needs: full screen big score, top corner small score, teams' presentations, statistics boards, timer, extended time, faults and penalty. Tickers and advertising can be displayed live from LiveCG Football and increase sponsors' and advertisers' exposure. LiveCG Football is used by major football clubs in Europe.
Delta-Stadium, the sports CG system developed by Deltacast and 3D Storm, is a new turnkey solution to generate and display 2D and 3D graphics for pre-game animations and presentations, clocks, animated scores, statistics management, actions, referee decisions and more. Delta-Stadium supports multiple sports interfaces (soccer, rugby, basketball or baseball). It is delivered with one sport and one generic interface, which allows the user to create a custom interface. 3D Storm and Deltacast have developed a new option, "Delta-Stadium Perimeter" to display signage on perimeter LED screens of an athletic field.

NEW PRODUCTION MODEL

"At Groupama Stadium, this equipment can manage the display of animations, scores and information on the big screens of the stadium. With the new version of DELTA-Stadium and Delta Stadium Perimeter Option, OL Images can broadcast animations on perimeter LED panels or courts caps, synchronized with the giant screens. The production team can also trigger with help of DELTA-Stadium the light effects and fumes through MIDI commands that can be transmitted to the equipment," explains Bruno Lesté, LiveXpert product manager at 3D Storm. "With NewTek and LiveXpert, our production model was revolutionized. Pre-game, half-time and post-match are produced in the same way as a TV show. Thus the mixer and the servers allow us to perform this task and broadcast on 176 m² of giant screens and 300 connected screens in the stadium," adds Nicolas Houël.
Now Nicolas Houël's production team of seven, offers an unforgettable experience to almost 60.000 spectators of the stadium, "I think we have come up with a good program. We are looking to evolve production with off-stage elements thanks to NDI. The relationship with the 3D Storm team is excellent. They listen and help us with the problems we encounter. Finally, when I hear the feedback from the audience on their experience at Groupama Stadium, I feel very glad." Constantly monitoring the new technologies, the next projects are to equip the training grounds with a capture system and analysis for the technical staff and live match production and to develop the infrastructure to open the new media channels for OL Images. "We have a great technical unit. Real team spirit! This notion has always been important for me. Maybe it's because of my passion for sports, but this element seems essential for the harmonious work of my team. Share, exchange and give are the notions that give the real spirit to our team."



Nicolas Houël, Olympique Lyonnais Technical Manager (OL IMAGES, OLTV)

Olympique Lyonnais **https://www.olweb.fr/en/**

Product pages :
https://www.3dstorm.com/en/livexpert/livecg-football - LiveCG Football
https://www.3dstorm.com/en/livexpert/delta-stat-ip - Delta-Stadium
https://www.3dstorm.com/en/newtek/tricaster-tc1 - NewTek TriCaster TC1

VISLINK SUPPLIES BROADCASTING TECHNOLOGIES FOR VOLVO OCEAN RACE

ROUND-THE-WORLD YACHT RACING IS ONE OF THE MOST GRUELLING SPORTING CHALLENGES A PERSON CAN PUT THEMSELVES THROUGH.

No yacht race comes more extreme than the Volvo Ocean Race – encircling the globe over a course of 45,000 nautical miles, facing waves of over 40m and extremes temperature ranges from -5 to 40°C. The 22m length yachts cross 4 oceans in an event stopping at 12 ports as teams battle it out on racing legs lasting more than 20 days across a global course lasting 9 months. And for the crew, all of this with only a single change of clothing!

It is perhaps no surprise that this extreme challenge should become a sporting event made for TV viewing.

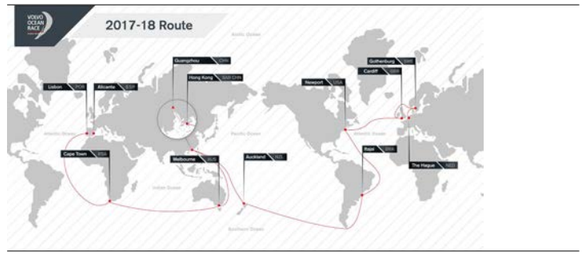
The real action comes though, not in mid ocean but in the close-fought in-shore racing that takes place near to port as each leg starts and finishes. In these highly technical battles of skill, teams fight it out to capture every breath of air - manoeuvring and jostling for optimum position around marker boys that form the course.

The 2.4 million visitors to the attractions at the touring Race Village can experience the excitement of the competitive sailing through live images relayed onto giant screens – as well as for global TV audiences.

To bring the close-up racing action to video screens, Volvo Ocean Race partnered with wireless camera experts – Vislink. Vislink's wireless broadcast technology and expertise allowed the event organisers to relay live, high quality video, back from chase-boats and low-flying helicopters to showcase the action of the competition.

The ocean is an unforgiving beast - not just for racing teams but also to communications systems. Vislink needed to transmit back to shore, footage from broadcast cameras on the chase-boats and gyro-stabilized helicopter cameras as it happened utilising narrow RF bands across kilometres of ocean. With the sea acting as an RF mirror, the waves and ripples of water combining the reflecting transmissions in an infinite number of disruptive ways, the technology deployed needed to be special.

Given the unpredictable effect the sea would have on the transmission, one reception location alone could not be depended upon to give the required performance. Vislink deployed multiple receive sites with combinations of antenna patterns to cover the desired areas on water and on shore, providing geographical diversity. The multi-path reception conditions from the sea and buildings in port created the scenario that whilst



some antennas would receive a strong, reinforced signal, others would be in weak signal nulls and that this situation would dynamically change. To get the best performance, Vislink grouped the antennas for a multi-zone Maximum Ratio Combining diversity system. Using this processing-heavy technique, the antenna signals are individually weighted and summed according to their instantaneous signal-noise ratios (SNR) to create a highly reliable data stream.

In order to achieve rapid deployment and installation simplicity as the event travelled from port to port, the RF feeds were demodulated close to the antennas by Vislink L2074 units, the recovered transport streams were carried cross-site on the event's Ip network via Fibre, Copper and in cases Microwave IP networks to the master control room for video decode by Vislink L2170 units with the camera feeds delivered to the director's production desk.

As the helicopter camera and camera chase-boats followed the in-shore race action and during port-based crew interviews, different antenna groups would be best placed to be in range of the mobile, wireless cameras. To allow a seamless transition from antenna group to antenna group the Vislink L2170 decoder employed dynamic transport stream, packet switching between the antenna groups to give optimum RF performance and maximum range across the whole event area and for many kilometres out to sea.

Careful consideration and planning was given to selecting the best wireless camera encoders and transmitters – tailored to each application. The full resolution, high definition feeds coming from the cameras used for the event only had at their disposal narrow 8MHz wireless channels. Vislink equipment brought with it the video compression knowledge to deliver and optimize the MPEG-4 video algorithms to balance the needs of the native 1.5Gbit/s content data-rate against the need for efficient bandwidth utilization and end-to-end latencies as low as 1 video frame.

The Vislink wireless camera equipment maintains and delivers raw camera feed quality content to the video mixing desk by making use of highest quality 4:2:2 chroma profile - ensuring that the images do not degrade as they pass through multiples stages of video processing compression in delivery from the event through to the end TV-viewing consumer.

With camera views expected to contain wide expanses of sky down to the horizon; To combat the posterization effect that can become highly visible on areas of graduated brightness with 8-bit luma processing, the Vislink system employs 10-bit luma quantization to deliver an artefact free picture.

It was important to ensure that all the camera views were carefully matched. The helicopter was equipped with a Vislink MTT3 transmitter – a unit purposely designed for airborne applications.

The MTT3 incorporates a low latency MPEG-4 high definition encoder and in combination with the transmission amplifier is capable of transmitting images over long distances. During the leg arrival and grand depart the helicopter was able to track the yachts and beam back footage from over 70km out to sea.

An in-shore race can often be won or lost at the start, as the yachts vie for optimum position - in preparation to cross the start line at maximum speed as the race begins. The chase boats allow the camera operator to get close-in to the action and allow the program Director to show the crews' battle of tactics and sheer physical strength as they adjust their sails to best harness the wind.

The broadcast cameras on the boats were equipped with Vislink Clip-on 4 wireless camera transmitters.

The Clip-on 4 camera transmitters deliver broadcast quality high definition video to match the needs of the giant video walls in the Race Village and to put to air internationally on TV channels. The latency of the Clip-on 4 camera transmitters was configured to match that of the helicopter camera transmissions allowing the Director to cut seamlessly between camera views.

With a range of up to 14 kilometres, the chase-boats with their wireless camera transmitters on board needed their signal boosting when operating at the limit of the boat's range. To avoid overloading the on-shore receivers, the chase-boat transmission power would require attenuating from maximum as the they tracked the yachts into port and the facilities of the Race Village. The Clip-on 4 wireless camera backs were connected to waterproof Vislink PLTX power amplifiers. These ruggedized devices gave the chase-boats the operational flexibility to manage the transmission power and operational range and be resilient to the harsh marine conditions.

With the in-shore races lasting over an hour - plus build-up and with the yachts taking their different routes across the ocean legs to the host ports, the camera teams need to be out at sea, broadcasting the live action for extended periods. Power efficiency and battery performance becomes a key consideration. The Vislink Clip-on 4 camera system has been designed at its heart to optimize electrical efficiency and deliver extended operation time. This power efficiency is not only of benefit to the production crews but also chimes with the sustainably message that flows through the Volvo Ocean Race where the corporate world is doing its bit to highlight the effect of single use plastics on the world's oceans and CO_2 emissions affecting climate change. Energy consumption used during the race's activities is monitored and published as part of the drive for the race activities to have minimal impact on our world.

At the end of a highly competitive day's sailing the crews' activities turn to rounds of media interviews as they describe the technical challenge of the event and the bursts of frantic activity followed by skilled, fine-tuning to harness every last breath of wind – and do their duty to their corporate sponsors.

The wireless broadcast cameras on the chase-boats are configured so that once back in port the camera operators can instantly repurpose their equipment to capture these media activities for the viewers at the event and on the sports broadcast channels.

With the Vislink Clip-on 4 wireless camera transmitters positioned on the camera battery mount the camera remains nicely balance for the operator - allowing comfortable operation on what is a very full day's job for the production team.

With the race day completed and the coverage of the boats leaving port for the last leg on their circumnavigation of the globe the equipment shows its portability and ruggedized pedigree as it is packed away and transported off to the final location for the grand finale and winner celebrations in The Hague.

vislink

AMP VISUAL TV MILLENIUM 6

LIVE PORTRAIT

TV Millenium 6

OB Truck

General Contact

AMP VISUAL TV

177, Avenue des Gresillons
92230 Gennevilliers
France

Stephane Dery
Senior Director Business Development

Tel: +33 1 46 88 88 77

stephane.dery@ampvisualtv.tv
http://www.ampvisualtv.tv

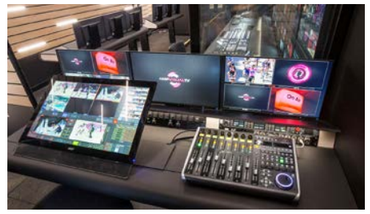
As a specialist in TV Coverage, AMP VISUAL TV provides services throughout the production process for live programmes and those produced under live conditions.

It has at its disposal one of the most extensive European fleets of OB vans for filming on location, and around twenty studios in the Paris region.
More than 500 employees assist our clients in devising, designing and carrying out filming, transmission and broadcasting of programmes destined for every screen format. Armed with its indisputable 30-year experience in television filming, AMP VISUAL TV has always strived to guide its clients in technological developments. Today, we master all the stages involved in producing programmes that meet consumers' expectations.

Inside View

Vision Mixer & Monitor Wall

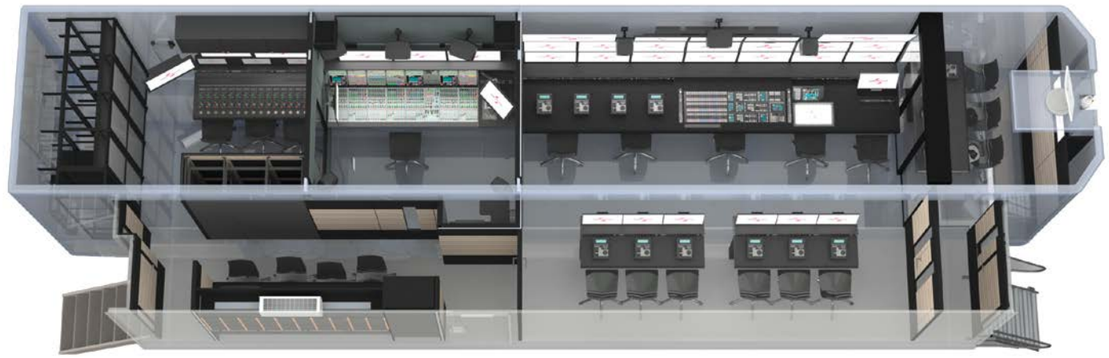
Sound Area



SloMo Desk

Camera Shading

2nd Production with SimplyLive



AMPVISUALTV

Equipment Specifications AMP VISUAL TV MILLENIUM 6
Single Expando: 14,5m Long, 4m High, 2,5m Width – Expands to 4,1m
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

TECHNICAL SYNOPSIS

TV Millenium 6

OB Truck

Video

- 14x UHD Cameras Sony HDC-4300
- Fiber Connectors from Lemo
- Lenses from Canon
- Heavy Duty Tripods from Vinten
- Vision Mixer: Sony XVS-7000 6M/E 8 Keyers
- Monitors in 4K Production Area from Sony BVW-X300 and EIZO 4K
- Audio Monitoring Genelec 8341 AMM Full Digital
- Monitors in Camera Shading Area from Sony BVW-X300
- Up to 8 HD Decks + USB Recorders
- 4x EVS XT3 8Ch
- 10Gb, 3Gbs SDTI, and GigE Network
- Digital Glue from Riedel
- Redundant System Controller: Lawo VSM
- Video Router: Riedel Mediornet 236 x 236 UHD up to 380 x 380 HD
- Measurement: Tektronix WFM-5200/8200 Ultra 4K Control

Audio

- Audio Mixer: Calrec Artemis 56 Faders
- Artemis Stage Boxes 32 x 32 Mic/Line and 48 x 16 Mic/Line
- Router: 5x 64 x 64 MADI, 16 x 16 AES, 2 Dante
- Audio Monitoring: Genelec 8341, Full Digital Surround Sound 5.1
- Audio Multi-track: Pyramix 64 Track
- Audio Effects: TC Electronic M6000
- Audio Server: Ableton with Soundforge Editing
- Microphones from Sennheiser, Neumann, Schoeps
- Audio Measurement: Tektronix WVR-8200

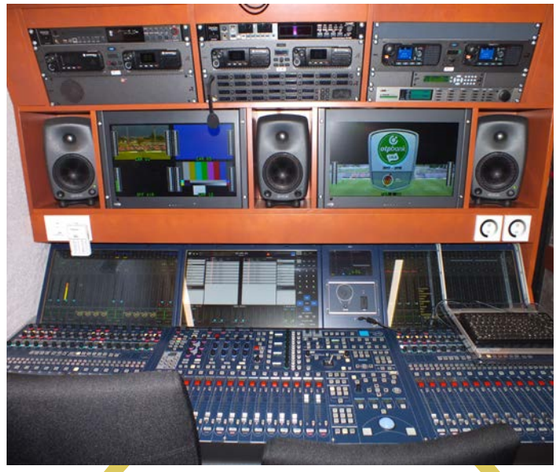
Intercom/Communication

- Matrix: Riedel Artist 128 x 128 up to 192 x 192
- 2 Hybrid Telephones
- 4 ISDN and IP Codec
- Wireless Intercom System BOLERO
- 1 Radio Simplex / 1 Radio Duplex
- Stage Box Intercom: ERECA RACER

System Integrator

videlio

Production Area



Sound Area

ANTENNA HUNGÁRIA OB 11

LIVE PORTRAIT

OB 11

OB Truck

General Contact

Antenna Hungária Zrt.

Petzvál J. utca 31-33.Chomutov
1119 Budapest,
Hungary

Viktória Vámossy

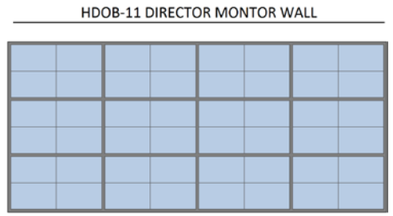
+36 70 204 8811

vamossyv@ahrt.hu
http://www.ahrt.hu/en/technical-equipment

Antenna Hungária service is provided with HD and 4K ready production trucks of 100% Hungarian design and manufacture. New vehicles are added to our fleet in accordance with market requirements.

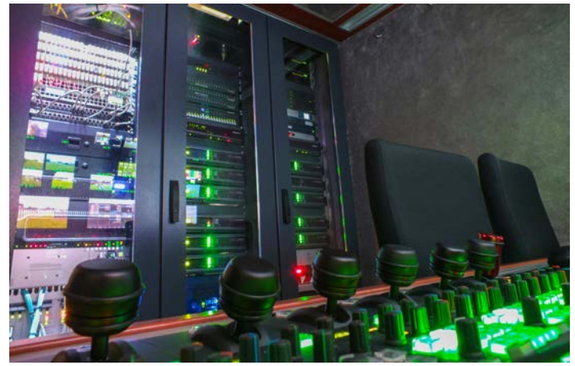
Due to decades of experience in outside broadcasting, comfortable and ergonomic workstations inside our production trucks have been designed by our engineers taking the highest technical requirements into consideration.Our equipment is continuously improved and state-of-the-art television equipment and technologies are employed in order to deliver high-quality outside broadcasts ordered by clients.

Our vehicle fleet is flexible and mobile. Each OB van can be easily adjusted to client requirements. We are able to easily set up any configuration at our clients' request. Vehicles and equipment are operated by an expert staff of engineers and technicians, guaranteeing uninterrupted production.
The mid-size OB 11 ideal for broadcasting smaller sport events, concerts and recording other TV shows. It is also eligible for recording and producing at 1080p format. OB 11 is ideal when the venue does not allow the use of a big size OB Van but the production requires spacious interior.

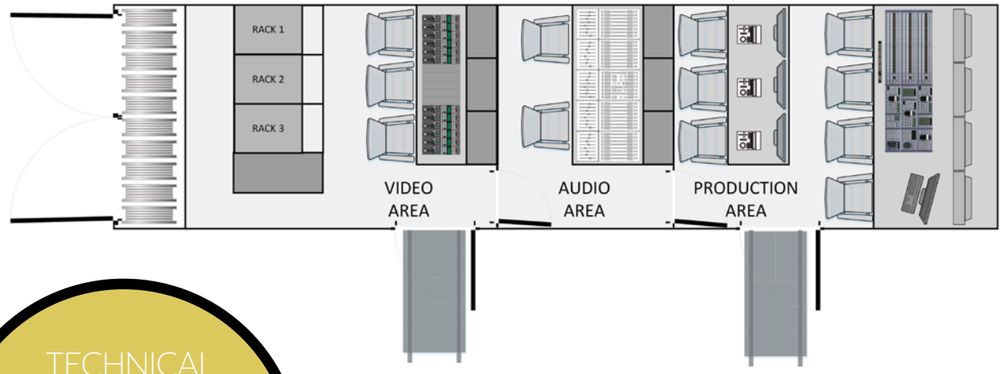


Camera Shading

SloMo Desk



Equipment Racks



TECHNICAL SYNOPSIS

OB 11

OB Truck

antenna HUNGÁRIA

Equipment Specifications Antenna Hungaria OB 11
14m Long, 4m High, 2,5m Width
Shifts between 1080p | 1080i | 720p

Video

9x Grass Valley LDX-82 Cameras
2x Grass Valley LDX-86 Cameras
1x Grass Valley LDX-82 Camera with Incam-G Vislink Wireless
Fiber Connectors from Lemo. Triax Connectors from Fischer
Lenses from Fujinon
Tripods from Sachtler
Vision Mixer Production: Sony MVS-7000X
Monitors: 16x Vutrix 24" with Quad-Split
Monitors Shading Area: 3x Sony PVM-A170, 3x Vutrix 19" Quad-Split, 3x Vutrix 10" Dual-Split
Recorders: 1x Sony PDW-HD1200 plus 1x VideoDevices PIX 270i and LGZ USB
SloMo Server: 2x EVS XT3 with ChannelMax
Digital Glue: Densite (GV) Selenio (Imagine), Yellobrick (Lynx) MrdiorNet (Riedel), V__Pro8 (Lawo)
Video Controller: TSL TallyMan
Router: GV Nvision 8140 144 x 288
Measurement: Leader LV-5333, Phabrix SX- TAG

Audio

Audio Mixer: Lawo mc²56 MKII (48 Fader)
Audio Matrix: Lawo Nova 73 Compact Core up to 8192 Crosspoints
Audio Monitoring: Genelec 804, 8030 Surround Sound 5.1
Audio Effects: TC Electonics M3000, Waves SoundGrid Server One
Multi-Track Recorder: Video Devices PIX 270i
Microphones from Sennheiser (MKH 416, 8070), Schoeps (MK4, 21), Neumann (KK184, KK143)
Audio Measurement: Wohler AMP1-16V-MD

Intercom/Communication

Matrix: Riedel Artist 64 x 64
Wireless Talk-Back: Riedel RiFace with Acrobat
ISDN Codec: Riedel Connect Trio

System Integrator

Antenna Hungária ZRt and Rexfilm Kft

REXFILM broadcast communication

CINEVIDEO DOLPHIN 7.0

LIVE PORTRAIT

DOLPHIN 7.0

OB Truck

General Contact

Cinevideo SRL

Via Monti Di Campli 1/4
65125 Pescara
Italy

Andrea Buonomo
CEO, Owner

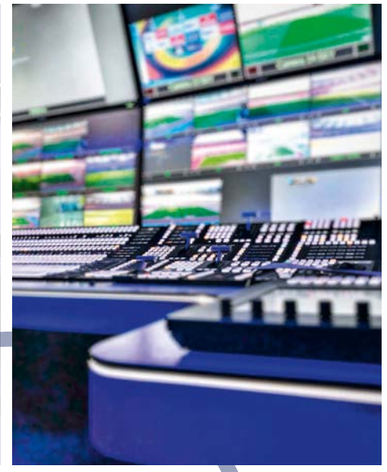
+39 335 7748 462

info@cinevideo.it
www.cinevideo.it

A dynamic company, able to respond to the demands of quality, reliability and economic optimization that every day the television market demands, and that offers its technical and creative know-how at the service of television production.

R.I.N.A. ISO 9001 certifi ed for the high quality standard guaranteed throughout the chain of production, Cinevideo is formed by a young and specialized management, coordinated by the founder, ready to meet the customer requests for all stages of production and to propose the use of new and exclusive technologies. DOLPHIN 7.0 can accommodate in a space of around 60sqm two separate production on the same truck, with 2 different audio rooms and two different production rooms. For the UHD we will use both quad-link and 12G sdi, and all the system is controlled by Lawo VSM. Cinevideo has been the first Italian company to acquire the exclusive shooting system SPRINTCAM by I-MOVIX and provides a coverage of Ultra Slow Motion replay for major national and international sport events, as the National football league Serie A, the Six Nations rugby, the 2016 Uefa Champions League final in Milano with 2 x UltraSloMo system and many more.

Production Area



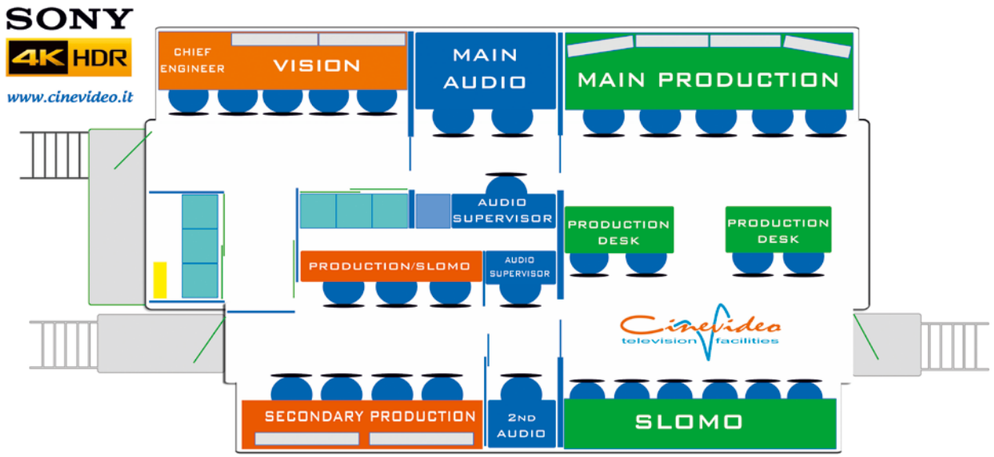
Vision Switcher

SloMo Area

Sound Area

2nd Production

Camera Shading



Cinevideo television facilities

Equipment Specifications DOLPHIN 7.0
Triple Expando: 12m Long, 4m High, 2,5m Width – Expands to 6m
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

TECHNICAL SYNOPSIS

DOLPHIN 7.0

OB Truck

Video

- Up to 24x Sony HDC-4300 Cameras
- Fiber Connectors from Lemo
- 4x Wireless Camera Adapters
- Lenses from Canon
- Tripods from Cartoni and Sachtler
- Vision Mixer Production: Sony XVS-8000 with 5 UHD M/E and 12 HD M/E, 5 M/E in Main Production, 2 M/E in 2nd Production, 1 M/E for Assistant Prod.
- Monitors in Main Production: 8x 43" Monitors with Multiview (Part of the Router)
- Monitors Shading Area: 1x Canon DP-V2421 UHD, 4x TVLogic 17", 2x 55" with Multiview (Part of the Router)
- HDR Processor HDRC-4000
- Harddisk / SloMo Server: 3x EVS XTVIA
- 10Gb, 3Gbs SDTI, and GigE Network
- Digital Glue from Ross Video
- Router: Imagine Communications IP3 SXP-Pro 576 x 576, Ross Video Ultrix 12G 64 x 64
- Video Controller: Lawo VSM
- Measurement: Phabrix QX12G

Audio

- Audio Mixer: 2x Calrec Artemis
- Audio Matrix: 2x Calrec Artemis Light Core
- Surround Sound 5.1: Jünger DAP8
- Microphones from Sennheiser, Holophone
- Audio Measurement: RTW TM7

Intercom/Communication

- Matrix: Riedel Artist 128 x 128 and 64 x 64
- ISDN and IP Codec: AEQ
- Wireless Talk-Back: Riedel RiFace and Bolero

System Integrator

- Broadcast Solution Italy

ERR MOON

LIVE PORTRAIT

ERR MOON

OB Truck

General Contact

Eesti Rahvusringhääling (ERR)

F. R. Kreutzwaldi 14
15029 Tallinn
Estonia

http://err.ee

Mihkel Robam
Head of Audiovisual Department
15029, Tallinn; Gonsiori 27

Mob: +372 565 5587
E-mail: teenus@err.ee

Sander Ükskülа
R&D Manager, TV Production Technology
15029, Tallinn; Gonsiori 27

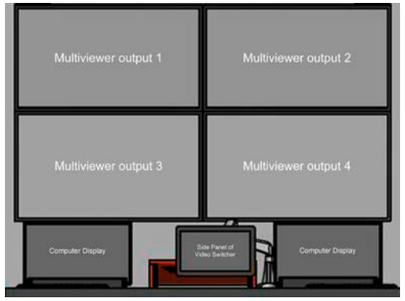
Mob: +372 521 1102
Phone: +372 628 4094

E-mail: sander.ykskyla@err.ee

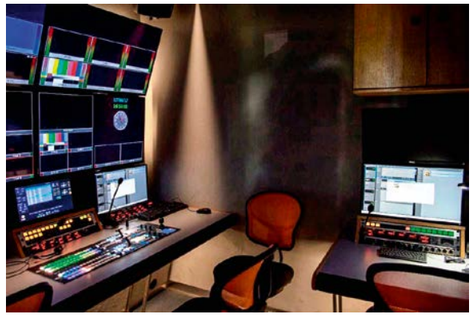
Eesti Rahvusringhääling (ERR) – Estonian Public Broadcasting – is a publicly funded radio and television organisation created in Estonia on 1 June 2007 to take over the functions of the formerly separate Estonian Radio and Estonian Television.

The first chair of ERR is Margus Allikmaa, the former chair of Eesti Raadio. Present CEO is Erik Roose. Regular radio broadcasting in Estonia began on 18 December 1926. TV was first broadcast in Estonia on 19 July 1955. ERR receives a state grant to fund the operation of its five national radio channels and three TV channels. ERR participates in a number of projects within the European Broadcasting Union, , of which it is a full member, notably in musical exchanges and concert series. In addition, ERR's Radio Drama Department has won international recognition at events organised by the EBU. On 19 September 2014, the Estonian government approved the creation of a dedicated Russian-language TV channel as part of the ERR network. The channel ETV+ was launched in late September 2015.

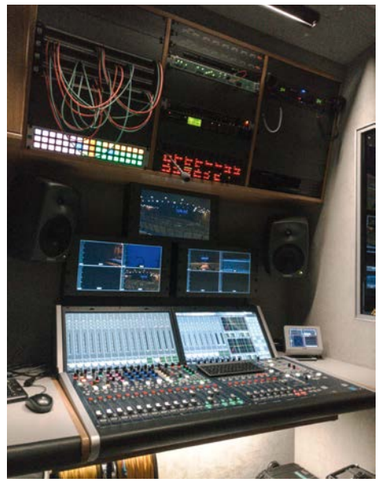
Inside View



Monitor Wall



SloMo Desk



Sound Area

Camera Shading

Storage Part in the HD OBVan

LIVE PORTRAIT

ERR MOON

OB Truck

Eesti Rahvusringhääling

Equipment Specifications ERR MOON
10m Long, 4m High, 2,5m Width, Weight 16t

Video

- 6-8 Cameras Grass Valley LDX-80 + 2 Wireless Camera Systems Grass Valley LDK-8000/LDK 54 (optional)
- Triax Connectors from Fisher
- Lenses from Canon
- Heavy Duty Tripods from Miller
- Vision Mixer: Grass Valley SAM Kula 2,5 M/E
- Character Generator: CG Caspar
- Monitors in Production Area: 4x Sony 40" BRAVIA FWL-40W705C
- Monitors in Camera Shading Area: TV Logic 2x XVM-245W-N, 2x LVM-246W, Sony 1x FWL-40W
- Multiviewers: Imagine Communications PX-SXP-32X6 & PX-SXP-16X3
- VTRs: 1-2 Sony PDW-HD1500 (optional)
- Hard Disk Recorders: Slomo.TV 8Ch Arrow 662 or Grass Valley 8Ch Dyno
- BMD HyperDeck Studio Pro2 and BMD H.264 Pro Recorder
- Digital Glue from Imagine Communications
- Video Controll System: Lawo VSM
- Video Router: Imagine Communications Platinum MX 112 x 88
- Video Measurement: Imagine Communications CMN-41-3GB

Audio

- Audio Mixer: Lawo mc²36 24 Faders with integrated 224 x 224 Matrix
- Imagine Communications 512 x 768 Platinum Audio Matrix MX
- Stage Box (32 Mic/Line, 32 Line OUT, 8 AES IN/OUT, 1 MADI, 8 GPIO)
- Audio Monitoring: Genelec , 8340A Stereo
- Audio Multi-track: JoeCo BLACKBOX (optional)
- Audio Effects: TC Electronic M2000
- DirectOut MADI Sample Rate Converter MADI.SRC SC/SC
- Microphones from Sennheiser, DPA, Neumann, Schoeps, Electro-Voice
- Audio Measurement: RTW Touchmonitor TMR7 Smart

Intercom/Communication

- Matrix: Riedel Artist 64 x 64
- Riedel RiFace base station and Motorola GP Series Wireless Talk-Backs
- Sennheiser EW 300-2 IEM G3 In-Ear Monitoring
- ISDN Codec: AEQ Eagle (optional)
- Commentary Unit: Riedel CCP-1116, Glensound OC-24/OC-26
- Commentary Positions in the Drivers Cabin

System Integrator

TVC

- Integrated cargo space in the back of OBVan (no need for support van)

INFINITY 4K OBVAN

LIVE PORTRAIT

4K OBVAN

OB Truck

General Contact

Infinity Multimedia Production:

No. 15, Lane 488
Fuxing North Road
Zhongshan District
Taipei City
Taiwan

Chia Wei Lin
Vice President

+886 2 2502-9674

inf.inity@msa.hinet.net
www.infinity-vision.com.tw

Taiwan's first and only fully 4K (UHD) HDR OB van, officially launched in 2016— with a Calrec Artemis Light digital audio console. Followed by a second 4K HDR OB van completed this year, with a Calrec Summa console installed. Taiwan's leading broadcast and media production company for more than thirty years... Infinity was also Taiwan's first-ever HD OB van in 2006.

In addition to upgrades for each 4K HDR OB van—to align itself with ever-changing international industry standards and provide high-quality format options or industry-leading technology to local or visiting production customers, Infinity has evolved over the years into a one stop shop. With a complete 4K production to post-production workflow, live event operations to post-concert films for DVD, the current lineup has been customized to meet the broadcast recording and delivery requirements of international or milestone concerts, sports, and live events in 4K UHD HDR in Taiwan. Lead and coordinated by Infinity, while responsible for the event's Sub Broadcasting Center (SBC)—Infinity delivered the 29th Universiade games' opening and closing ceremonies in 4K, marking Taiwan's first 4K live coverage for official broadcast locally and to worldwide viewers, utilizing more than twenty 4K cameras and a fully redundant Calrec Artemis console, the highest quality video and sound pairing. One of the earliest large-scale Ultra HD sports broadcasts in Asia. Infinity's 4K HDR OB vans, experience and technical capabilities are an industry benchmark, for the majority of TV stations in the market, setting into motion more broadcast upgrades now or a new fleet of 4K OB vans in the next few years.

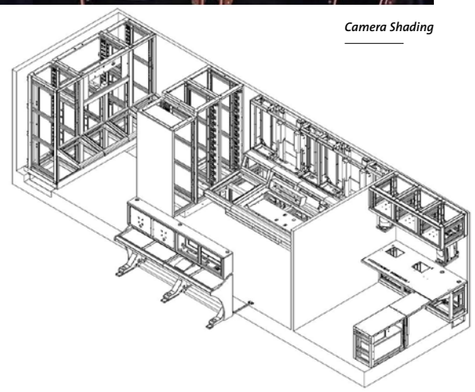
Production Area

Sound Area

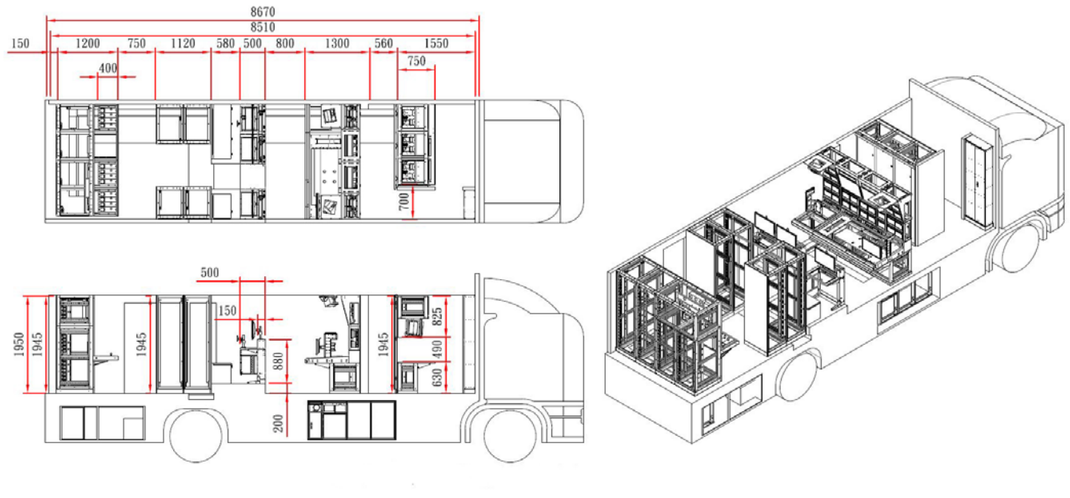
無限映像製作有限公司
INFINITY MULTIMEDIA PRODUCTION

Rec/Replay Area

Camera Shading



Sony Camera with Fujinon Box Lens at Universiade 2017



無限映像製作有限公司
INFINITY MULTIMEDIA PRODUCTION

TECHNICAL SYNOPSIS

4K OBVAN

OB Truck

Equipment Specifications Infinity 4K OBVan
8,7m Long, 4m High, 2,5m Width, Weight 26t

Video

10x Sony HDC-4300 Cameras
8x Sony PMW-F55 Cameras
1x Sony HDC-4800 Super SloMo Camera
Wireless Camera Adapters from Vislink
Fiber Connectors from Lemo
Lenses from Fujinon
Heavy Duty Tripods from Vinten and Sachtler
Vision Mixer: Sony XVS-7000 and GVG SAM Kahuna 9600
Character Generator: on Customer Request
Monitors in Production Area: 2x PVM-A250, 38x LMD-W941
Monitors in Camera Shading Area: 7x Postium 4K, 2x PVM-A170
Hard Disk Recorders: 2x Sony PWS-4400, 10x AJA KiPro Ultra
Video Router: Ross Video Ultrix-FR5 12G
Post-Production Available: Blackmagic Design's DaVinci Resolve with Final Cut Pro

Audio

Calrec Artemis Light, 40 Faders
Audio Matrix Calrec Hydra 4069 x 4096
Monitoring: Genelec
Microphones from Shure and Sony

Intercom/Communication

Matrix: Riedel
Wireless Talkback: Clear-Com

System Integrator

Hi-Pro Technology (Cinchy Corporation)
No. 372, 3F, Linsen North Road,
Zhongshan District,
Taipei City
Taiwan
+886 2 2563-3811
info@hiprotech.com.tw

新記股份有限公司
CINCHY CORPORATION

LIAONING TV HD OB-3

LIVE PORTRAIT

HD OB-3

OB Truck

General Contact

Liaoning
Radio and TV station (LRTV)

No.79 Wenhua Road
Heping District
Shenyang City, Liaoning
China

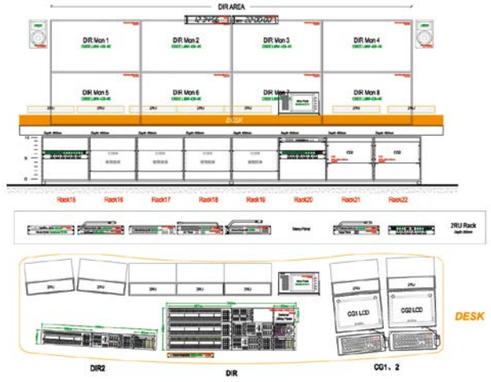
Ze Fu
Technical Director

Mobile: +86 139 4000 2263
http://www.lntv.com.cn/

Liaoning Television, LRTV or Liaoning Radio and Television is located in Shenyang, Liaoning province, China.

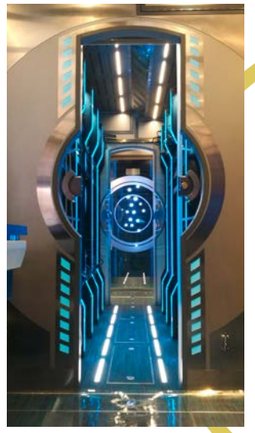
The television was launched on October 1, 1959. And it is one of the earliest launched televisions in China. LRTV now has 6 radio channels and 8 public TV channels and one of them is satellite channel to cover whole China, 24 VOD channels for the viewers in Liaoning Province and 4 Pay TV channels for all the viewers in China. LRTV broadcasts only in Mandarin (usually with Chinese subtitles, and occasionally English as well for some features, such as The Ultimate Fighter: China). LRTV's TV and radio broadcasts can be streamed for free online on their main website.

Inside View



Equipment Racks

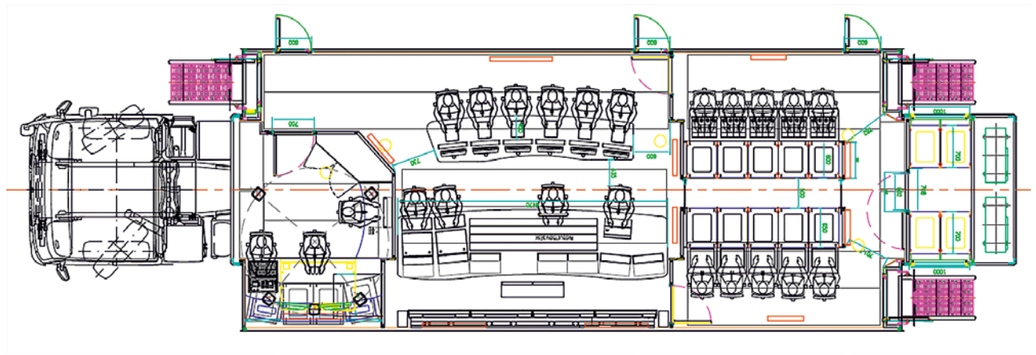
Sound Area



SloMo Desk

Camera Shading

Equipment Racks



TECHNICAL SYNOPSIS

HD OB-3

OB Truck

Equipment Specifications Liaoning TV HD OB-3
16,5m Long, 4m High, 2,5m Width, Width expanded 4,7m, Weight 32t

Video

- 18x Cameras Sony HDC-2580
- 2x Cameras LMP HD1200
- 2x Super SloMo Cameras HDC-4800
- Fiber Connectors from Lemo
- Lenses from Fujinon
- Heavy Duty Tripods from Sachtler
- Vision Mixer: Sony XVS-6000
- Character Generator: CDV-A10 HD
- Monitors in Production Area: OSEE LMW-420 4K
- Monitors in Camera Shading Area: 9x LMD-A170
- Multiviewers: AXON Synview II, OSEE Aurora1600
- VTRs: 2x Sony PDW-1200
- Hard Disk Recorders: 2x EVS XT3 and 3x Atomos Shogun Studio
- Digital Glue: AXON Synapse
- Video Router: Pesa Cheetah 128NE
- Video Measurement: Leader LV5770

Audio

- Studer Vista 1 Black Edition
- Surround Sound 5.1 Monitoring: JBL LS305 and LS310S
- Microphones from Shure

Intercom/Communication

- Matrix: Telex Zeus III 32 x 32
- Wireless Talkbacks: Motorola

System Integrator

- Guanhua Glory AV System Integration Co.Ltd

Coach Builder

- Aerospace new long march electric vehicle technology co. ltd
- The coach is made of lightweight composite materials
- Innovative design philosophy

LRT OB X

LIVE PORTRAIT

OB X

OB Truck

General Contact

Lithuanian National Radio and Television (LRT)

S. Konarskio str. 49
03123 Vilnius
Lithuania

Arminas Paulauskas
Head of OBVan

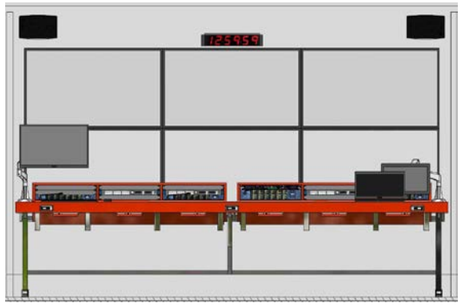
+370 5 236 31 63

Arminas.Paulauskas@lrt.lt
http://lrt.lt

Lithuanian National Radio and Television (LRT) is a non-profit public broadcaster that has been providing regular radio services since 1926 and television broadcasts since 1957. LRT operates three national television, three radio channels and internet portal.

It also provides satellite and live internet broadcasts, radio and television podcasts. Organization employs around 600 people. Since the 1st January 2015, the Act amending the Law on the Lithuanian National Radio and Television came into force. Tis Act bands the commercial advertising on all LRT radio and TV channels but provides more sustainable funding from State budget. The assigned funding is based on the State Budget revenues from the income tax and the excise revenues received in two previous years. Its operations are overseen by the LRT Council. LRT joined European Broadcasting Union (EBU) 1993..

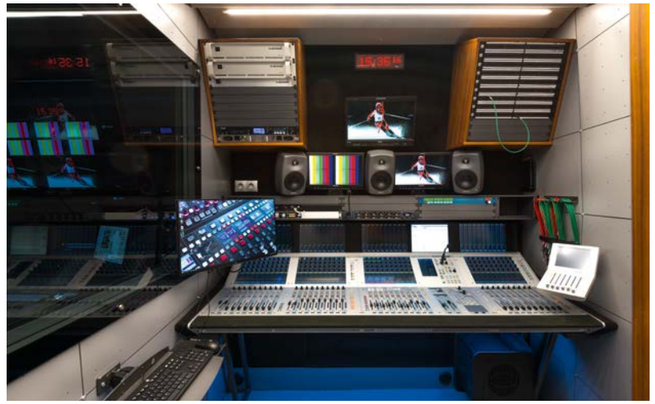
Inside View



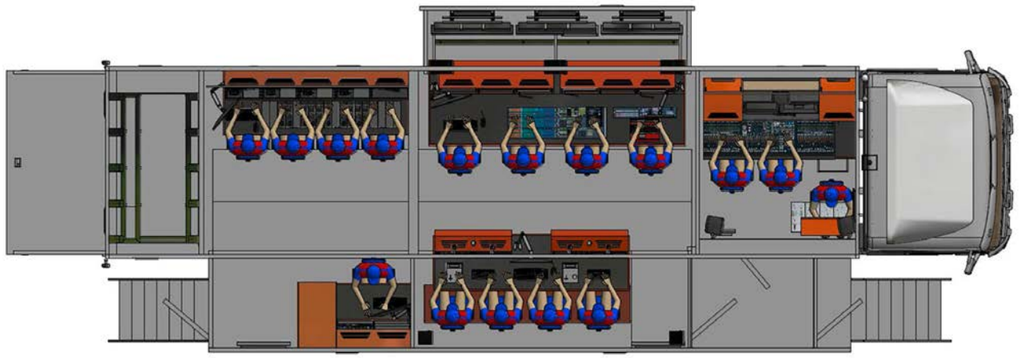
Monitor Wall

Layout Production Desk

Camera Shading



Sound Area



LRT

Equipment Specifications LRT OB X
12m Long, 4m High, 2,5m Width, Expanded Width 4,6m,
Weight 22t

TECHNICAL SYNOPSIS

OB X

OB Truck

Video

- 16 Cameras Sony HSC-100R
- Triax Connectors: Fisher 1051 Series with Percon Cables
- Lenses from Canon
- Heavy Duty Tripods from Vinten
- Vision Mixer: Grass Valley SAM Kahuna 3 M/E with Maverik
- Character Generator: ChyronHego
- Monitors in Production Area: 6x Sony 49" BRAVIA FW-49XE8001
- Monitors in Camera Shading Area: 5x TV Logic XVM-177A, 4x LVM-182W-A, 3x RKM-356A
- Multiviewers: Grass Valley (SAM) MV-800 Router Integrated MV (96 x 8 SDI), 6x Decimator Quad Splitters
- VTRs: 2x Sony PDW-HD1500
- Hard Disk Recorders: 1x EVS XT3 with ChannelMAX, 2 Remote Controllers
- BMD HyperDeck Studio Pro2 and BMD H.264 Pro Recorder
- Digital Glue from Grass Valley (SAM IQ)
- Video Controll System: SAM Dual Router Control
- Video Router: Grass Valley (SAM) Sirius 830 144 x 144
- Video Measurement: Imagine Communications 1x TVM9150PKG-EJ3, 3x TVM-4DG

Audio

- Audio Mixer: Studer Vista V
- Audio Matrix: Studer 16,896 x 16,896 Mono Channels Routing
- Audio Monitoring: Genelec, SAM Series
- Audio Multi-track: Sequoia 14, up to 128Ch
- Audio Effects: TC Electronic M6000 MK2
- Microphones from Sennheiser, Neumann
- Audio Measurement: RTW TM7

Intercom/Communication

- Matrix: Clear-Com HX Delta 256 x 256
- Wireless Talkback: Clear-Com FreeSpeak II

System Integrator

TVC

- Full automatic coach stabilizing and self-levelling system
- Acoustic isolation of production areas
- Dual side expansion
- Redundant air conditioning systems
- Motorized drums for triax and power cables
- Additional interior floor heating
- Preparation for cold climate
- Auxiliary van including 40 kVA Fisher Panda generator

"OUTSTANDING SERVICE"

ADAM BEVIS-KNOWLES
CAMERA MANAGER, TIMELINE TELEVISION LTD

"We've been pioneering 4K technology using FUJINON lenses alongside Sony cameras on sporting events such as the UEFA Champions League Final and the IAAF World Athletics Championships.

The UA80x9 is my favorite lens to use. It offers really sharp pictures coupled with real control. It offers incredible precision on the focus control that I simply haven't found anywhere else. The ramping area on the Fujinon UA80 is also minimal and virtually unnoticeable.

But what we value most is Fujinon's outstanding customer service and support. No matter where I am in the world, I know I can get the support and help I need should any issues arise. You'll always split hairs between people's views on a lens - optically or performance or usability - but you can't beat Fujinon's customer service, it's the defining characteristic that means we choose their lenses."

ADAM BEVIS-KNOWLES, TIMELINE

Broadcast Anywhere
Timeline TV

@FujinonLenses

FUJIFILM
Value from Innovation

FUJINON

MEDIACAM

LIVE PORTRAIT

OB4

OB Truck

General Contact

Mediacam

Via Amico da Venafro 6
00176 Roma
Italy

Massimiliano Tonti
CEO & Founder

Tel: +39 06 836 2229

max.tonti@mediacam.net
http://www.mediacam.net

Mediacam works in the field of the broadcast television facilities alongside the most important television networks and media production companies.

Mediacam managed to get a great success through the productions thanks to its experienced team who reached a great knowledge over the years and thanks to the latest update technologies that Mediacam provides to its customers. The company fleet includes multicam HD and 4K OB-Vans from 4 to 24 cameras ables to deal any kind of production from the entertainment shows format to big concerts and sports as football games, motorsport races, winter sports events, cycling, tennis and more.

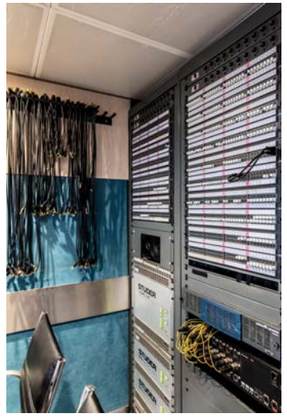
Production Area

SloMo Area

Camera Shading Area

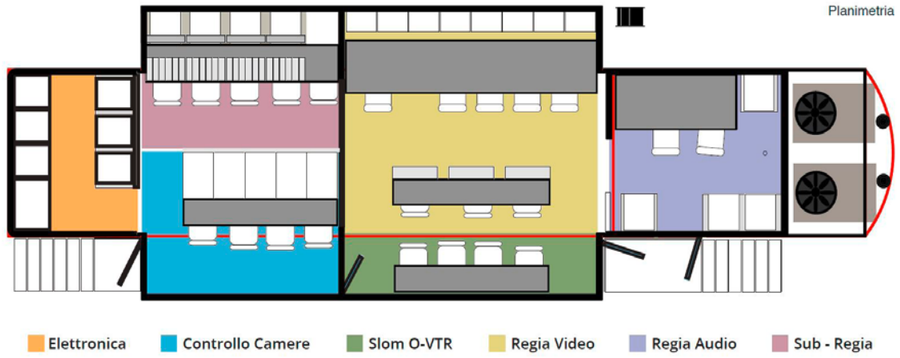
Sound Area

Equipment Racks



Audio Patch Panel

MEDIACAM
BROADCAST TELEVISION FACILITIES



MEDIACAM
BROADCAST TELEVISION FACILITIES

Equipment Specifications Mediacam OB4
Douple Expando: 13,5m Long, 4m High, 2,5m Wide – Expands to 4,4m
Shifts between UHD – HDR | Super SloMo | 1080p | 1080i | 720p

TECHNICAL SYNOPSIS

OB4

OB Truck

Video

Up to 10x Sony HDC-4300 4K Cameras
Up to 24x Sony HDC-1500/HDC-3300 HD Cameras
Fiber Connectors from Lemo
4K / UHD Lenses from Fujinon – HD Lenses from Canon
Vision Mixer: Sony MVS-7000X 6M/E 60in/40out 2DME
Monitors in Production Area: 2x BVM-X300, 3x Sony 24", 8x 42" Penta H2Line
VTRs/Servers: 15 positions are available for HDCam or EVS
Monitors for SloMo: 4x Sony 24" LCD
10Gb, 3Gbs SDTI, and GigE Network
Digital Glue from Imagine Communications X50
Video Matrix: Imagine Communications IP3 256 x 256
Measurement Equipment:
Tektronix WFM 5300 & WFM 8000

Audio

Audio Mixer: Studer Vista 5 (40 Fader)
Audio Router: Studer 634 x 634
Backup Mixer: Yamaha 01V96
Multi-Track Recording: Tascam Jingle Machine
Audio Monitoring: Genelec, 5.1 Surround Sound
Microphones from Sennheiser

Intercom/Communication

Matrix: Riedel Artist 128 x 128 with 20 Panels
Wireless: Riedel Acrobat System with Beltpacks
ISDN Codec: AEQ

Power Required

380V/400V, three phase, 1x 125A

MEDIAPRO OB52 UHD

LIVE PORTRAIT

OB52 UHD

OB Truck

General Contact

Mediapro

Virgilio,2
Ciudad de la Imagen, Edificio 1
ES- 28223 Pozuelo de Alarcon,
Madrid
Spain

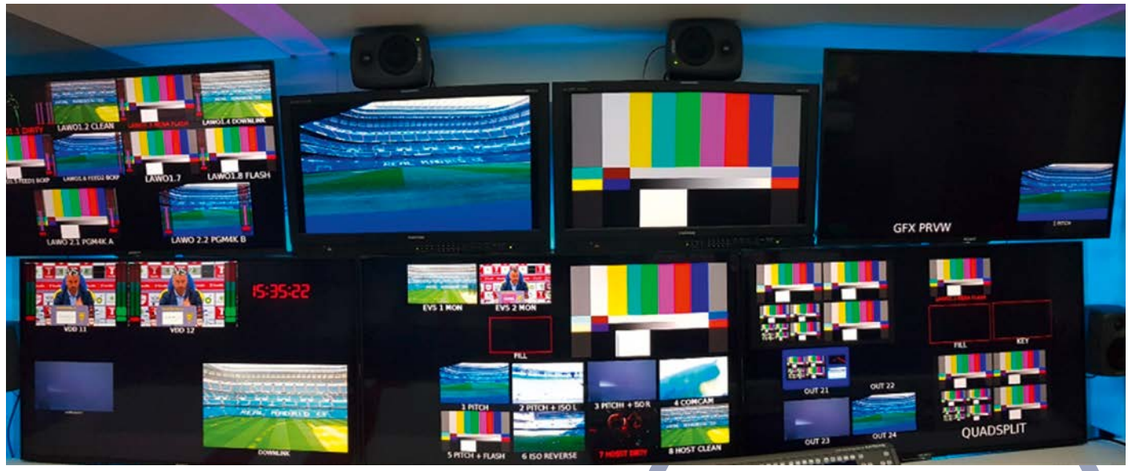
Francisco de la Fuente
General Manager

+34 93 476 1515

mediapro@mediapro.es
http://www.mediapro.es

MEDIAPRO produces and distributes audiovisual content, administers and distributes sporting events, is a film and interactive content producer, plus supplier of post-production services.

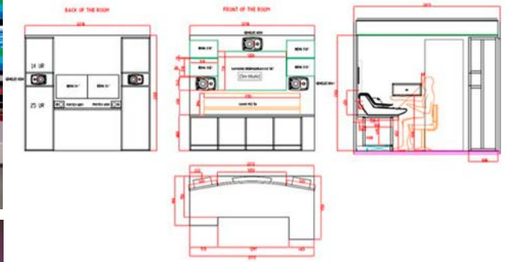
With activity in 35 venues spread across four continents, it has a team of about 4,450 professionals. Created in 1994, MEDIAPRO makes more than 2,500 productions each year thanks to its own mobile units and broadcast of events in high definition worldwide. Currently, its teams participate in the production of the most important football leagues, emphasising its coverage of global sports championships. In its role as a leader in innovation in the European audiovisual field, MEDIAPRO has established one of the most advanced 4K production technology with the capacity for live HDR production, specifically for sporting events.



Monitor Wall

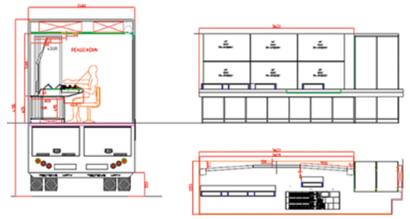
Inside View

Sound Area



SloMo Desk

Camera Shading



Monitor Wall

MEDIAPRO

Equipment Specifications Mediapro OB52 UHD
Single Expando, 16,5m Long, 4m High, 2,5m Width,
4m Width expanded, Weight 38t
Format 4k and HD

TECHNICAL SYNOPSIS

OB52 UHD

OB Truck

Video

- Up to 16x Cameras Grass Valley LDX-86N
- Lenses from Canon and Fujinon
- Heavy Duty Tripods from Vinten
- Vision Mixer: Grass Valley Kayenne 5 M/E
- Monitors in Production Area: 2x Sony BVM-X300, 5x Sony 40" BRAVIA
- Genelec 5.1 Audio Monitoring
- Monitors for Camera Shading: 1x BVM-X300, 4x Postium 24", 2x NEC 32"
- Multiviewers: Grass Valley Kaleido (2x 24x2, 4x 26x2)
- VTRs: 4x AJA Ki Pro Ultra Plus, 2x Sony PDW-HD1500
- SloMo Rec/Replay: 5x EVS XT3 8Ch LSM with 10x 24" Asus Monitors
- Digital Glue from Grass Valley (Densite), Lawo (V__pro8), FOR.A and SAM
- Video Controll System: Lawo VSM
- Video Router: Grass Valley Sirius 830 288 x 288 with 4K & IP Support
- Video Measurement: Leader LV5490 4K

Audio

- Audio Mixer: Studer Vista V 42 Faders
- Stage Box (32 Mic/Line, 16 Line OUT)
- Audio Monitoring: Genelec, 8340A Surround Sound 5.1
- Displays: 1x 40" NEC, 2x 24" Asus
- Wide Range of Wired and Wireless Microphones

Intercom/Communication

- Matrix: RTS OMNEO 32 x 32
- 20 Intercom Panels

System Integrator

- Mediapro

MOBILE TV GROUP 43 FLEX

LIVE PORTRAIT

MTVG 43 Flex

OB Truck

General Contact

Mobile TV Group

8455 Highfield Parkway
Englewood
CO 80112
United States of America

Nick Garvin
Chief Operating Officer

Tel: +1 720 573 6562

ngarvin@mobiletvgroup.com
www.mobiletvgroup.com

Mobile TV Group (MTVG) is celebrating its 23rd anniversary with continued dedication to technological innovation, customer service, maintenance, and competitive pricing.

In recent years MTVG has added an increasing number of national, college, and entertainment events, totaling over 4,000 events annually. With 30+ mobile units (plus "B" units, Audio trailers, etc.), MTVG is able to base its facilities, engineers, and drivers all over the U.S. This allows for the most effective local services to the regional networks and visiting national networks. In addition, MTVG's event coordinators are assigned to our clients, giving them a consistent and one-stop service. The combination of engineers, event coordinators, and drivers create very cost effective and easy productions. In 2003 MTVG launched the "dual feed" concept which made it possible to do both home and visitor high definition productions from a single mobile unit. This approach has evolved to a "side-by-side dual feed" where home and visitors work in separate trailers, but from a central set of electronics. As a result, the company can provide both home and visitor the same low rate for each side, but with space and facilities equivalent to two mobile units. Every year, MTVG is adding two more of these "side-by-side duals" in order to provide this efficiency nationwide. MTVG adheres to a set of strongly enforced principles: First among these is integrity, ethics, and fairness. With respect to its mobile units, MTVG has a no-deferred maintenance policy. If something breaks or fails MTVG repairs or replaces it by the next event – regardless of cost. We urge you to ask any one of MTVG's customers or vendors about their service.

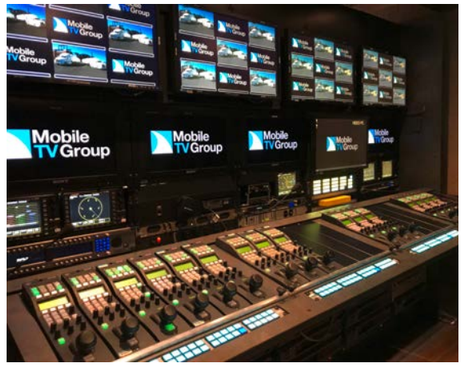
Prodzction Area

2nd Production Area in VMU

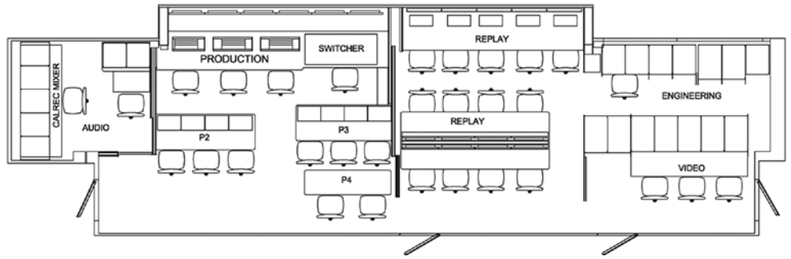
Sound Area

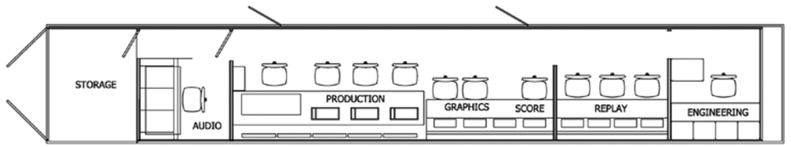
Rec/Replay Desk

SloMo Area



Camera Shading Area





Mobile TV Group

Equipment Specifications MTVG 43 Flex
Double Expando: 16,15m Long, 4m High, 2,62m Wide – Expands to 5m
Shifts between 1080i | 720p

TECHNICAL SYNOPSIS

MTVG 43 Flex

OB Truck

Video

- 9x Grass Valley LDX-82 Premier Triax Cameras with twin XCUs
- 2x Additional LDX-82 if using VMU
- 2x Grass Valley LDX-86 Univers Super SloMo HD Cameras (on Request)
- 2x Grass Valley LDK-8000 Triax Cameras
- 4x SMPTE to Singlemode Converters (SHEDS)
- Lenses from Canon and Fujinon,
- 4 HH ENG viewfinders
- 8 Grass Valley RefleX SuperExpander Sleds w/ 7" OLED VF's
- Heavy Duty Tripods from Vinten and Mathews
- Vision Mixer: Grass Valley HD Kayenne K-Frame Switcher 7M/Es
- 12 iDPMs, 2D DPMs, FlexiKey, DoubleTake, 32 Chroma Keyers
- 132 Monitors in production wall
- Character Generator: ChyronHego HyperX³, Mosaic or VizRT (on Request)
- Monitors in Production Area from Sony
- Monitors in Camera Shading Area from Sony
- 4x EVS XT3 12 Ch Full Editing Replay Servers with 16 Ch Audio
- One of the 12 Ch XT3's can be used for Spotbox
- Lance TDC-100 Disk Controller
- 10Gb, 3Gbs SDTI, and GigE Network
- EVS XFile with USB 3.0
- Digital Glue from Evertz
- Video Matrix: Evertz 378 x 802 3G Router

Audio

- Audio Mixer: Calrec Artemis Beam (64 Fader)
- Audio Board can output multiple Channels of Surround Sound
- Audio Matrix: Evertz 2,752 x 2,848
- RTW TM7 Audio Scope
- Audio Monitoring: Genelec, 5.1 Surround Sound
- Microphones from Sennheiser, Crown and Sony

Intercom/Communication

- Matrix: RTS ADAM 64 x 64 w/OMNEO
- RTS 4030 IFB Beltpacks
- RTS BP325 Headset Boxes
- RTS TIF 2000
- Two-Way Radios with two Base Stations

Power Required

- 208 VAC, three phase, 200amps

NEP AUSTRALIA

LIVE PORTRAIT

IP 21

OB Truck

General Contact

NEP Australia

Level 3, 8 Central Avenue
Eveleigh (Sydney)
NSW 2015
Australia

Andy Armstrong
Director of Sales

Tel: +61 2 96908060

aarmstrong@nepgroup.com
www.nepgroup.com

IP 21 is the world's first 100 per cent SMPTE 2110 outside broadcast truck and the first of four purpose-built IP production vehicles that NEP Australia launched in 2017-2018.

The IP trucks are designed to operate as both standalone outside broadcast (OB) vehicles, or connect to the Andrews Hubs – NEP's new remote centralised networked production facilities in Sydney and Melbourne. IP 21 and its sister vehicles are the most flexible trucks in NEP's fleet, running a completely virtualised and IP core with no physical limitations.

Production Area

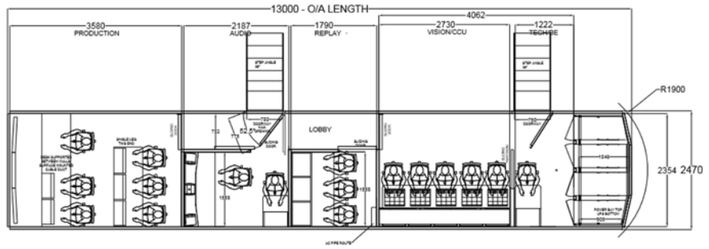
Sound Area

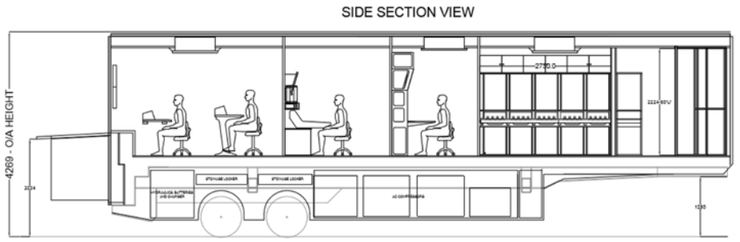
Vision Mixer

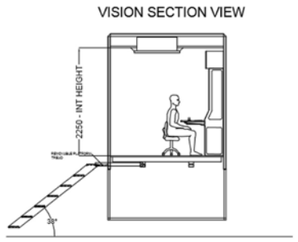
Sound Area

100 Gbs DPN Connection at IP21

100 Gbs DPN Connection at Venue







NEP

Equipment Specifications NEP Australia IP 21
Single Box Style: 13m Long, 4,3m High, 2,5m Wide
4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p
Scalable to Suit Project and Connectivity
100 per cent SMPTE 2110 IP Infrastructure

TECHNICAL SYNOPSIS

IP 21

OB Truck

Video

- 16x native SMPTE 2110 Sony IP camera control units (CCUs)
- 2 x Sony PXW-Z450
- with DTC Aeon 4K RF/wireless camera systems
- Lemo SMPTE fibre
- Lenses from Canon
- Tripods from Vinten and Sachtler
- Vision mixer: Sony XVS-6350 3.5M/E SMPTE IP switcher
- UHD Boland monitor wall with Lawo V_Matrix multi-view
- Monitors in camera shading area from Sony
- 2x EVS XT4 12 Ch
- KVM Devices: IHSE Draco Tera Compact
- Measurement: Tektronix Prism and WFM5250
- 30x SDI Inputs
- 30x SDI Outputs

Audio

- Audio mixer: Lawo mc²56 IP
- Intercom/communication
- Telex IP communications
- IP Transmission to the Hubs in Sydney or Melbourne

System Integrator

- NEP Australia System Integration Team

NEP BELGIUM

LIVE PORTRAIT

Unit 18 4K UHD

OB Truck

General Contact

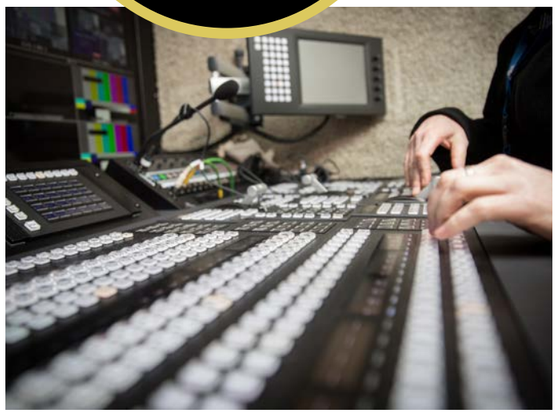
NEP Belgium

Wingepark 17
3110 Rotselaar
Belgium

Andre Verbesselt
Technical Director

+32 16 23 27 52

andre.verbesselt@nepgroup.com
www.nepgroup.com/belgium



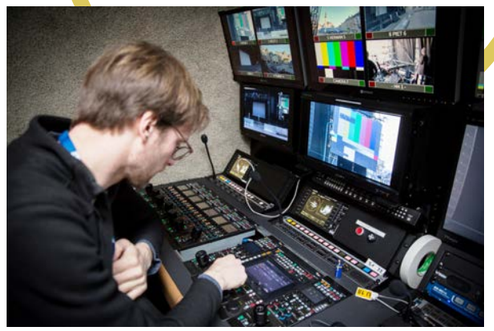
NEP Belgium is an OB provider based just outside of Leuven with an extensive fleet of mobile production trucks. The technology deployed in those OBs allows NEP Belgium to work across all kinds of custom productions.

Unit 18 is the first example of Streamline S8L, using a different room design and a production desk arranged lengthways in the direction of motion. Offers 10 workplaces. An additional novelty refers to more flexible interconnectivity capabilities, using IP-based audio and video bridging devices.
New to the S8 and the Streamline OB Vans in general, is the implementation of a Lawo V__matrix software-defined IP-routing and processing core which handles processing, De-/Embedding and RGB colour correction of the signals. The S8L comes with two video stageboxes, each equipped with a Lawo V__link4. This provides a one-box-solution for all the requirements of IP-based stageboxes including video and audio signal transport and processing.

Production Area

Sound Area

Operating the Audio Desk



Camera Shading

Equipment Racks

TECHNICAL SYNOPSIS

Unit 18 4K UHD

OB Truck

Equipment Specifications Unit 18 4K UHD
Box Body: 10,1m Long (incl. Cabin), 3,8m High, 2,5m Width, Weight 12t

Video

- 8x Sony HDC-4300 or GVG LDX-86 Universe Cameras
- Lemo SMPTE Connectors
- Lenses from Canon
- Tripods from Sachtler
- Vision Mixer: Sony XVS-6000
- Character Generator: NEP self-built
- Monitors in Production Area: 4x Sony 49" and 2x AG Neovo 24"
- Monitors in Engineering Area: 4x AG Neovo 24", 2x Sony 17", 1x TV Logic 24"
- Multiviewers: Part of the Imagine Communications Platinum SX Pro
- Hard Disk Recorders: 2x EVS XT3 and 2Ch NEP USB Recorder
- Video Controll System: Lawo VSM
- Video Router: Imagine Communications Platinum SX Pro and Lawo V__Matrix
- KVM Devices: IHSE Draco tera
- Video Measurement: Leader LV 5333

Audio

- Audio Mixer: Lawo mc²36 with 40 Faders
- Audio Matrix: Integrated in the Mixer 512 x 512 and DirectOut Montone 42
- Audio Monitoring: Genelec, SAM Series
- Audio Multi-track: Ableton
- Audio Effects: TC Electronic M6000
- Microphones from Sennheiser, Beyerdynamic, Bartlett
- Audio Measurement: RTW-TM9

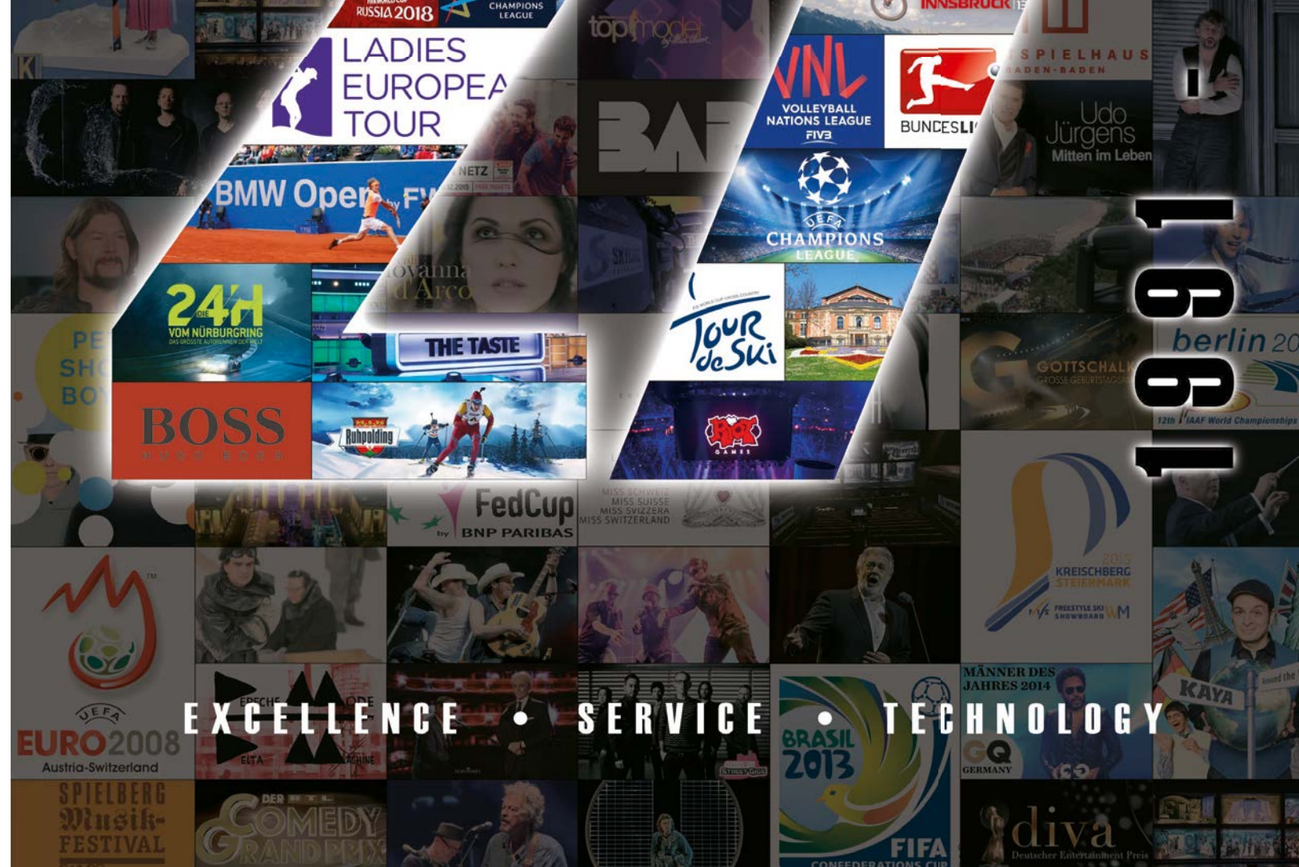
Intercom/Communication

- Matrix: Riedel Artist 64 x 64
- Wireless Talkback: Riedel RiFace / Motorola
- ISDN Codec: AVT
- Networking System: Arista

Stageboxes

- Audio: Lawo Dallis Compact I/O
- Video: Lawo V__link4, LawoV__Matrix

System Integrator



NEP SWEDEN

LIVE PORTRAIT

UHD1

OB Truck

General Contact

NEP Sweden

Ranhammarsvägen 12-14
168 67 Bromma
Sweden

Mats Berggren
Sales Manager

Tel: +46 70 232 0945
Tel: +46 70 303 35 43

mberggren@nepgroup.com
http://nepsweden.com/

"We designed our new van to be a showcase for the latest in 4K/UHD and HDR broadcasting technologies, and Riedel's MediorNet is no exception.

The highly scalable MediorNet signal transport and routing system gives us new dimensions of flexibility, redundancy, and reliability, paving the way for the van to support any type of 4K production," said Jens Envall, Technical Director NEP Sweden. "We also appreciate the simplicity of the solution. With capabilities like the MediorNet MultiViewer App and other built-in signal processing, we're able to eliminate many external devices."

Designed to cover the highest-profile events across northern Europe, UHD1 was deployed for the first time to produce live coverage of the 2018 IIHF Ice Hockey World Championship from the Royal Arena in Copenhagen where Sweden won the gold medal. NEP Sweden provided the tournament's host broadcasting services for Host Broadcast Services (HBS), and for which it used 30 cameras, five of which were triple-speed super motion, and all recording in 1080p50 Full HD.

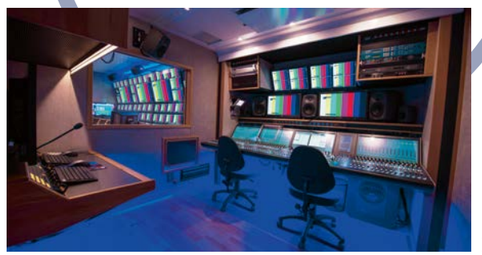
Inside View

Camera Shading

Production Area

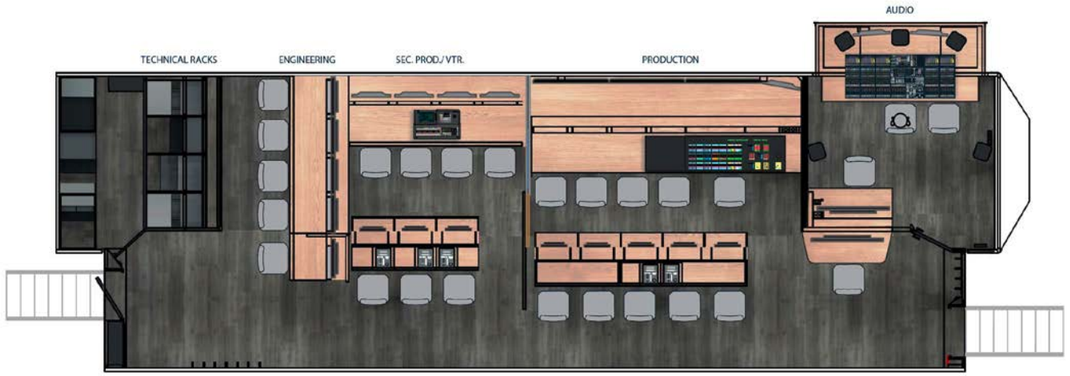
Vision Mixer an Monitor Wall

Riedel MediorNet



Sound Area

SloMo Area



Equipment Specifications NEP Sweden UHD1
Double Expando: 13,6m Long, 4m High, 2,55m Width – Expands to 5m, Weight 29t
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

TECHNICAL SYNOPSIS

UHD1

OB Truck

Video

- 24x Grass Valley LDX-86N Highspeed/Extremespeed or 4K
- 2x Grass Valley LDX-C86N Highspeed/Extremespeed or 4K
- Up to 6x Vislink Wireless Adaptors
- Fiber Connectors from Lemo
- Lenses from Canon
- Tripods from Sachtler
- Vision Mixer Production 1: GVG Karrera 9M/E with K-Frame (192 x 64)
- Vision Mixer Production 2: GVG Korona 1 M/E
- Character Generator: Vizrt
- Monitors in Production 1: 6x NEC (48"), 3x TV-Logic (23"), 1x NEC (24"), 5x AG Neovo (24"), 1x TV-Logic (55")
- Monitors in Production 2 / Slomo 1: 8x TV-Logic (23")
- Monitors in Slomo 2: 3x AG Neovo (24")
- Multiviewer: Riedel MicroN
- Monitors in Shading Area: 5x TV-Logic (23"), 5x TV-Logic (24")
- Harddisk / SloMo Server: 6x EVS XT4K
- Video Controller: Lawo VSM
- KVM Devices: IHSE Draco Tera
- Digital Glue from GVG SAM
- Router: Riedel MetroN Core Router (Routing and Multiviewer) (492 x 492, incl. Stageboxes) non-blocking (9x MetroN and 46x MicroN)
- Measurement: Phabrix PHQX, Leader LV5333

Audio

- Audio Mixer: Lawo mc²56 (64 Fader)
- Audio Matrix: Lawo Nova 73, DirectOut MADI Router
- Audio Monitoring: Genelec, Surround Sound 5.1
- Audio Effects: TC Electronic M6000
- Microphones from Sennheiser
- Audio Measurement: RTW

Intercom/Communication

- Matrix: Riedel Artist 128 x 128
- ISDN and IP Codec: Riedel
- Wireless Talk-Back: Riedel RiFace with Motorola

System Integrator

NEP UNITED STATES EN3

LIVE PORTRAIT

EN3

OB Truck

General Contact

NEP Group

2 Beta Drive
15238 Pittsburgh, PA
United States

Jay Summerlin
Senior Director of Sales and Client Service

Tel: +1 800 444 0054

jay.summerlin@nepinc.com
http://www.nepinc.com

Every NEP launch pushes the technological envelope. The debut of EN3 for ESPN on March 30, however, was historic: it's the first truck in North America built around a SMPTE ST 2110 IP routing core.

After a long standardization process, SMPTE officially published the first standards within ST 2110 Professional Media Over Managed IP Networks in December, and EN3 is the first mobile unit to be designed and integrated specifically around the new standards suite. Of course, installing the first SMPTE 2110 core was about much more than bragging rights for NEP. Rather, the IP infrastructure in EN3 allowed NEP to create one of the most flexible mobile units ever. Although EN3 is fully capable of 4K and HDR production, there are no near-term plans to utilize these capabilities.

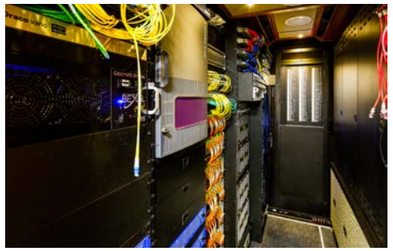
Inside View

Vision Mixer & Monitor Wall

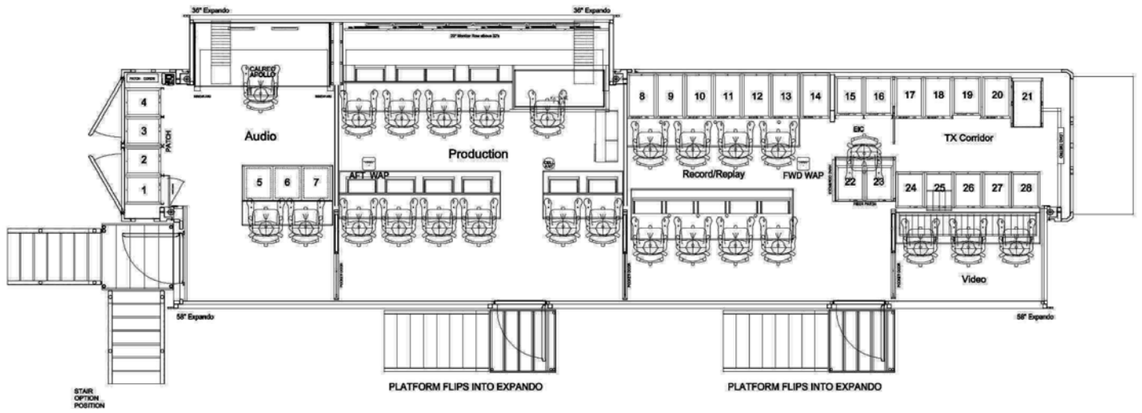
Sound Area

Camera Shading

SloMo Desk



Equipment Racks



TECHNICAL SYNOPSIS

EN3

OB Truck

Equipment Specifications NEP EN3
Single Expando: 16,5m Long, 4m High, 2,5m Wide – Expands to 4,1m
Shifts between Super SloMo | 1080p | 1080i | 720p | IP enabled | 4K ready

Video

- 10x Sony HDC-2500 Camera, 2x HDC-4300 Camera
- 12 CCUs on Board
- Fiber Connectors from Lemo
- Lenses from Canon: 8x 95x8.6 Box, 4x 22:1, 2x 4.3 Wide Angel
- Heavy Duty Tripods from Vinten
- Vision Mixer: GVG Kayenne 5,5 M/E, Flexkey, Elite Package
- Graphics: VizRT and FOR.A Telestrator
- Monitors in Production 18x 32", 8x 20"
- 1x DVCPro, 1x HDCAM, 1x Sony PMW-RX50 SxS Reader
- 4x EVS XT4K 12 Channel LSM
- 2x EVS XFile, 1x EVS IPDirector, 3x EVS XHub,
- 1x SimplyLive
- 10Gb, 3Gbs SDTI, and GigE Network
- Redundant System Controller: Evertz Vue
- Video Router: Evertz EXE 732 x 732

Audio

- Audio Mixer 1: Calrec Apollo with Bluefin, 72 Faders, 1020 Channels
- Audio Matrix: Evertz EXE Analog 192 x 192, AES 96 x 96, MADI 35 x 35
- Calrec HYDRA Stage Boxes
- Audio Multi-track: 2x Digicart
- Microphones Shotgun, Lavalier, Stick

Intercom/Communication

- Matrix: RTS ADAM 368 x 368
- 20 dual listen Beltpacks
- 22 IFB Beltpacks
- 18 Walkie Talkies with 2 Base Stations
- 1 Phone System with 16 Lines

System Integrator

- NEP

RECKORD REC7

LIVE PORTRAIT

REC7

OB Truck

A Czech private company founded in 1996, focused on delivery of TV services, equipment and crews for virtually any type of event large and small, live, streamed or recorded.

In the beginnings (1998-2005) we co-operated with TV PRIMA, Česká televize (Czech television) and TV NOVA in the media coverage production. For TV NOVA we provided live reports for the regional news broadcast „Právě teď" („Right now") from the Ústí nad Labem and Karlovy Vary regions. At the same time we produced advertising films, DVDs, promotion spots and multimedia presentations. Since 2006 Reckord has specialized in providing services in the field of television transmissions and records as well as services associated with this field.In June 2012, Reckord bought the establishment "Přenosy ACE a.s." and in 2017 the Polish company "MultiProduction z.o.o" was bought. Reckord has integrated these new production capacities into the structure of the company Reckord – outside broadcasting s.r.o.

General Contact

Reckord - outside broadcasting s.r.o.

Raisova 5484
Chomutov
43001
Czech republic

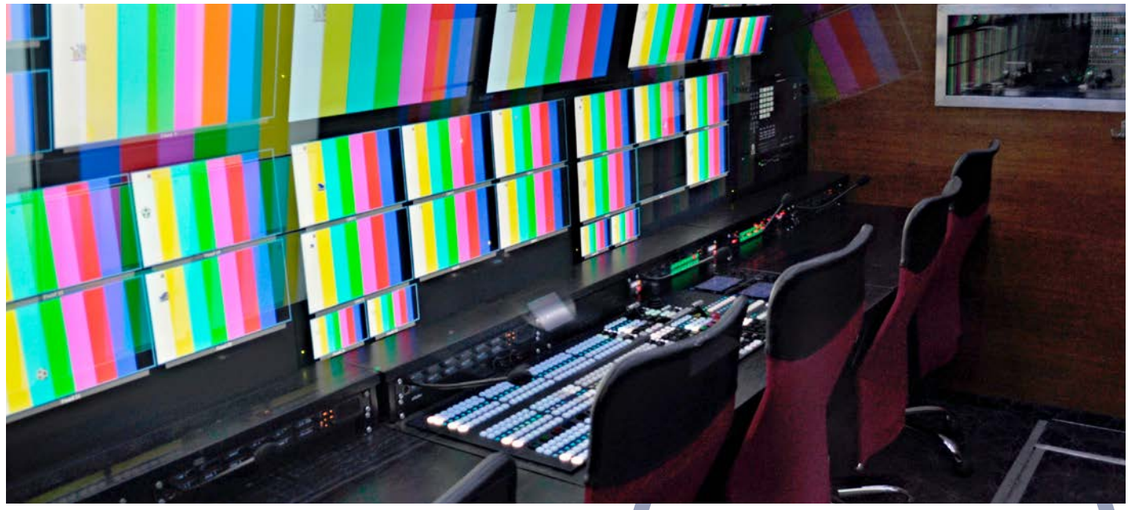
www.reckord.tv

Robert Kallista
CEO, Owner

+420 603 523 644
kallista@reckord.tv

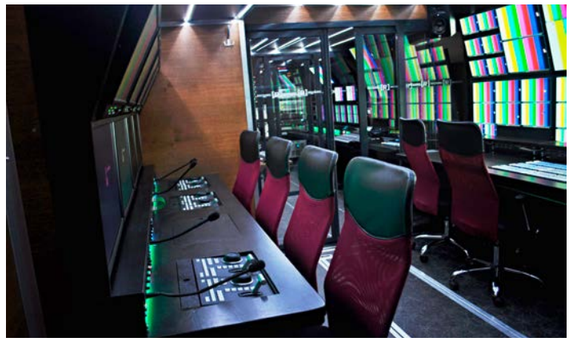
Nikola Kejaková

+420 732 182 074
n.kallistova@reckord.tv



Production Area

Sound Area



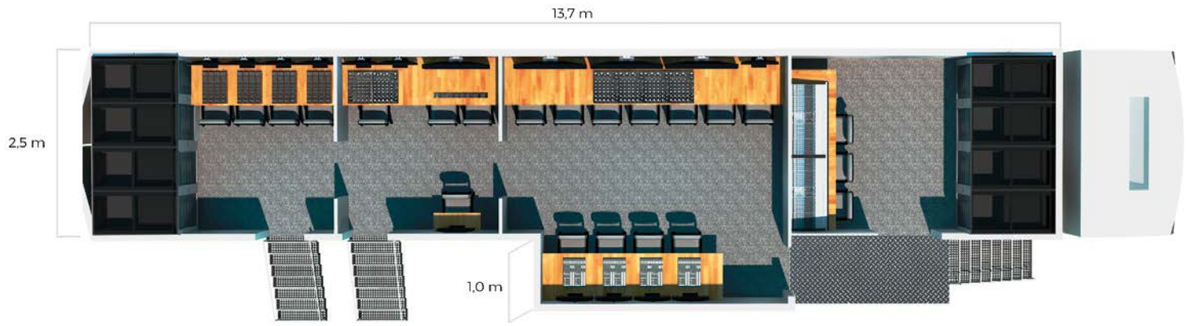
SloMo Desk

Equipment Racks

RECKORD
OUTSIDE BROADCASTING

Camera Shading

SloMo in Operation



RECKORD
OUTSIDE BROADCASTING

Equipment Specifications Reckord REC7
Single Expando: 14m Long, 4m High, 2,5m Width – Expands to 3,8m
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

TECHNICAL SYNOPSIS

REC7

OB Truck

Video

- Up to 16x Sony HDC-4300 Cameras
- Fiber Connectors from Lemo
- Lenses from Fujinon
- Heavy Duty Tripods from Vinten
- Vision Mixer Production 1: GVG SAM Kahuna 9600 3M/E, 8Key per M/E
- Monitors: 5x NEC 42", 1x Sony PVM-X550 4K
- Vision Mixer Production 2: GVG SAM Kahuna 9600 1M/E,
- Monitors: 1x NEC 55", 2x NEC 27"
- Multiviewer: Apantac
- Audio Monitoring Genelec 8341
- Monitors Shading Area: 1x Sony BVW-X300, 4x PVM-A170, 4x LMD-A220
- HDR Processor HDRC-4000
- Harddisk / SloMo Server: 3x Sony PWS-4500
- 10Gb, 3Gbs SDTI, and GigE Network
- Digital Glue from Axon
- TC, REF and GPS Generator: 2x Evertz MSC5601 + 1x ACO
- Video Controller: TSL Tallyman TM2
- Router: GVG SAM VEGA
- Measurement: Phabrix

Audio

- Audio Mixer: Studer Vista V
- Artemis Stage Boxes:Riedel & Studer
- Audio Monitoring: Genelec 8341, Full Digital Surround Sound 5.1
- Audio Effects: Lexicon
- Microphones from Sennheiser, Rode
- Audio Measurement: DK Technologies

Intercom/Communication

- Matrix: Riedel Artist 64 x 64
- ISDN and IP Codec: Glensound
- Wireless Talk-Back: Motorola

System Integrator

- Reckord

STUDIO BERLIN

LIVE PORTRAIT

Ü9 4K UHD

OB Truck

General Contact

Studio Berlin GmbH

Am Studio 20
12489 Berlin
Germany

Matthias Alexandru
Technical Manager

Tel: +49 30 6704 5515

m.alexandru@studio-berlin.de
http://www.studio-berlin.de/

Grass Valley has supplied Studio Berlin, a German full-service provider for live television production solutions, with a suite of equipment for its outside broadcast (OB) trucks and TV production studio facilities, including 50 LDX 80/82/86/86N Series Cameras and LDX C80 Compact Series Cameras plus six K-Frame Video Production Center switchers capable of producing in 4K UHD.

The camera purchase is part of a three-year contract with Grass Valley. Studio Berlin is planning to substitute a significant total of 70 LDK Cameras with the new LDX models within that period. In addition, German system integrator Broadcast Solutions GmbH has built a new 16-camera 4K UHD OB truck that is based on Broadcast Solutions' successful S16 Streamline series, and has therefore ordered the large Grass Valley 4K UHD K-Frame switcher, whose resources are shared between a 3-stripe Karrera main panel and a 2-stripe GV Korona subpanel.

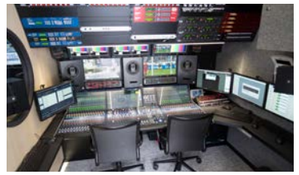
Inside View

Vision Mixer and Monitor Wall

Sound Area

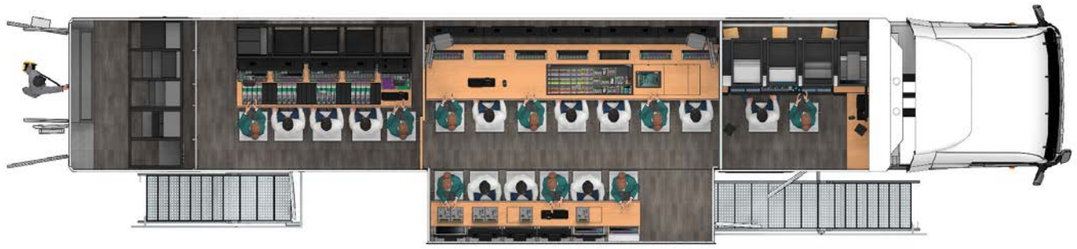
Studio Berlin

Camera Shading



Sound Area

Rec/Replay Area



Studio Berlin

Equipment Specifications Studio Berlin Ü9 4K UHD
Single Expando: 13,6m Long, 4m High, 2,5m Width –
Expands to 3,75m, Weight 27t
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

TECHNICAL SYNOPSIS

Ü9 4K UHD

OB Truck

Video

- Up to 19x Grass Valley LDX-86N Cameras
- Fiber Connectors from Lemo
- Lenses from Fujinon
- Tripods from Vinten
- Vision Mixer Production: Grass Valley Karrera 9M/E, (132in x 68out)
- Character Generator: Ross Xpression
- Monitors: 10x Sony UHD 43" and 2x 24" – for SloMo 12x AG Neovo 24"
- 2nd Production in Support Truck: Grass Valley Karrera with 1M/E Panel
- Monitors: 2x Sony UHD 49", 1x AG Neveo 24"
- Monitors for Camera Shading: 2x Sony UHD 49", 2x Sony BVM-X300, 5x Postium UHD 24", 3x AG Neovo 24", 2x KVM 24"
- Multiviewer: Riedel MicroN
- Audio Monitoring Genelec 8341
- 4x Sony XDCAM VTR
- 4x EVS XT3/4K Server, up to 12Ch each
- 10Gb, 3Gbs SDTI, and GigE Network, 5x HP 48 Port Switch
- Digital Glue from Axon, Riedel, Imagine Communications and Grass Valley
- Video Controller: Lawo VSM
- Router: Riedel MediorNet consisting of: 17x MicroN Standard, 12x MicroN MultiViewer), 5x MetroN Core Router,2x Modular, I/O configuration
- KVM Devices: Guntermann & Drunck
- Measurement: Phabrix PHQX, Leader LV 5333

Audio

- Audio Mixer: Lawo mc²56 xc
- Audio Router: Lawo Nova 73
- Audio Monitoring 5.1: Genelec, Geithain
- Audio Effects: Lexicon, Sonifex
- Multi-Track Recorder: Teatro, Avid Pro Tools
- Microphones from Sennheiser, Schoeps
- Audio Measurement: RTW

Intercom/Communication

- Matrix: Riedel Artist 128 x 128 and 32 x 32
- ISDN and IP Codec: AVT
- Wireless Talk-Back: Riedel RiFace, Motorola

Stageboxes

- Audio: 6x Lawo Dallis
- Video: 6v Riedel MicroN

System Integrator

broadcast SOLUTIONS
www.broadcast-solutions.de

SHANGHAI MEDIA TECH

LIVE PORTRAIT

SMT UHD-6

OB Truck

General Contact

Shanghai Media Tech (SMT)

OB Department
No.203 Old Hutai Road
Jing'an District
Shanghai
China

Roman (Chen) Ling
Business Development Department Director

Mobile: + 86 186 215 112 01

lingchen@smg.cn
https://www.mediatechsh.com

Shanghai Media Tech or SMT is one of China's largest media and cultural conglomerates, with the most complete portfolio of media and related businesses.

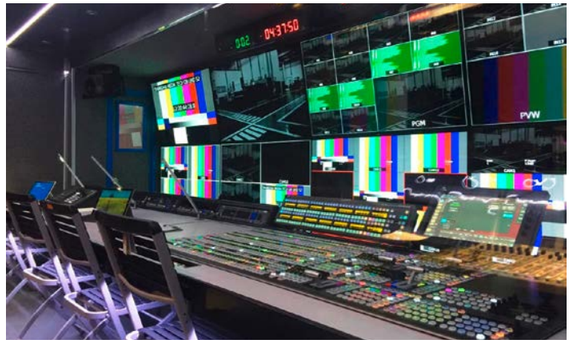
Shanghai Media Tech (SMT) evolved from the former Technical Center of Shanghai Radio and Television Bureau which was established in May 1987.
SMT has the main business in the following seven fields: the broadcast, pre-production, post-production and transmitting broadcast of the radio and television programs, the operation and maintenance of the network, system integration and the application development of new media. Besides, SMT has also expanded to embrace some new business such as special effect cinematography, 3D/4K production, visual creation and New-Media product. In addition, SMT has established great partnership with global media giants such as BBC, NHK, ABC, KBS and Star TV in Hong Kong, meanwhile maintaining good cooperative relations with top institutions worldwide.

Inside View

Camera Shading

Production Area 1

上海东方传媒技术有限公司
SHANGHAI MEDIA TECH
SMG

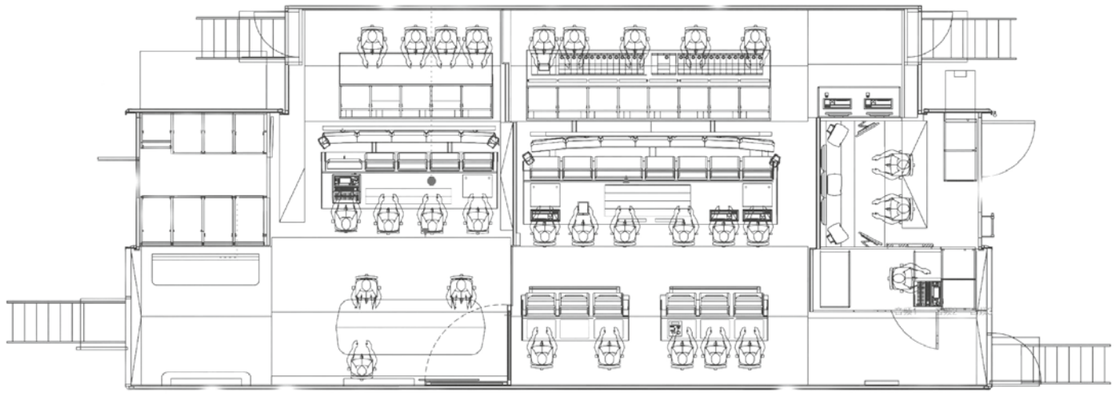


Vision Mixer and Monitor Wall

Audio Desk

SloMo Area

Production Area 2



上海东方传媒技术有限公司
SHANGHAI MEDIA TECH
SMG

Equipment Specifications SMT UHD-6
Double Expando: 18m Long, 4m High, 2,5m Width,
Width expanded 6,7m
UHD,2SI OR SQD 4*3G SDI;3840*2160 LEVEL A/B,
3G-SDI 1080/30/50/59.94P,
SDI-HD : 1080/50i | 1080/59.94i | 720p/59,94 | 720P/50

TECHNICAL SYNOPSIS

SMT UHD-6

OB Truck

Video

- 16x Sony HDC-4300
- 8x Sony HDC-2580
- Super SloMo Cameras HDC-4300: 2x 4K, 8x HD
- Fiber Connectors from Lemo
- Lenses from Fujinon
- Heavy Duty Tripods from Sachtler and Vinten
- 2x Polecam with Toshiba IK-4K
- Vision Mixer: GVG SAM Kahuna 9600 5M/E each with 4DSK
- Character Generator: 2x Dayang, 2x Orad HDVG4
- Monitors: Sony 3x PVM-X300, 45x PVM-A250, 32x PVM-A170
- Multiviewers EVERTZ XLINK,7800FR-QT+78PQT, VipX
- Hard Disk Servers: 4x EVS XT3 12 Ch and 2x XT4K, 1x Sony PWS-4400
- Digital Glue: AXON GDS110 and GXG410
- Genlock: TEK SPG8000
- Control System: Lawo VSM
- Video Router: Evertz XPTG 288 x 288
- Video Measurement: Leader LV7770, LV5490, LV5381

Audio

- Lawo mc²56, 48 Fader, 196 Ch DSP
- Yamaha DM1000
- Audio Router: Evertz XE-4 64 x 64
- Surround Sound 5.1 Monitoring: Dynaudio AIR6
- Microphones from Sennheiser MKH and Sony ECM

Intercom/Communication

- Matrix: RTS Adam 144 x 144
- Wireless Talkbacks: two base stations KA-450

SKY PERFECT BROADCAST

LIVE PORTRAIT

SPBC 4K HDR

OB Truck

General Contact

Sky Perfect Broadcast

1-14-14 Akasaka
Minato-ku
107-0052 Tokyo
Japan

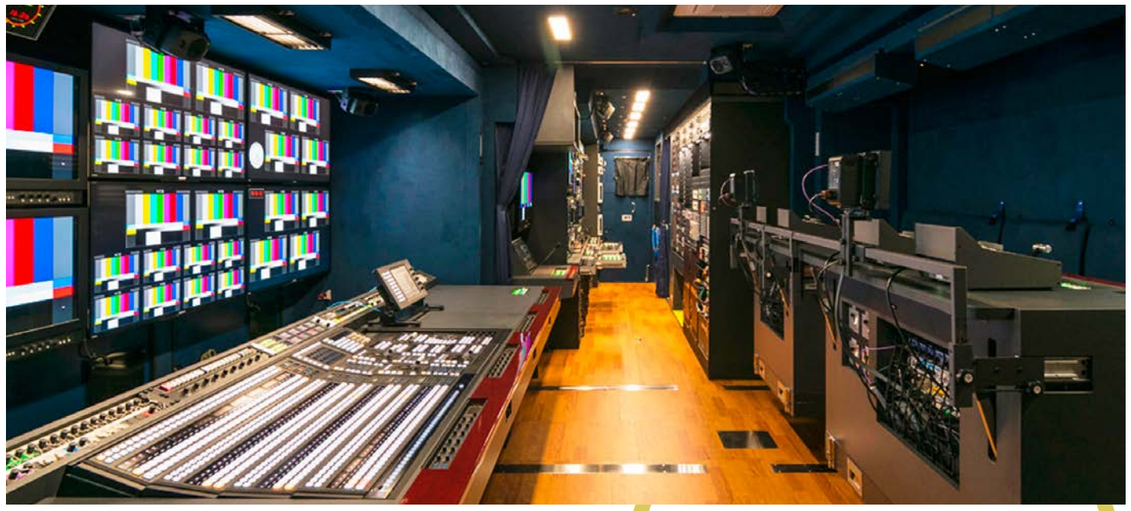
Masashi Iwawaki
Technical Director

Tel: +81 3 5571 7011
Iwawaki-nasashi@sptvbroadcast.co.jp

http://www.sptvbroadcast.com/

Comprehensive production that produces a variety of rich programs with state-of-the-art technology and planning power. We will make attractive programs utilizing 4K · HDR compatible relay trucks.

At the SPBC production team, we are recording and producing our own management channels, such as "Sukachan". In particular, we have abundant achievements and know-how in sports broadcasting production including domestic and overseas football leagues, Paralympic games and highlight program production. We also actively introduce state-of-the-art technology to meet the needs of the times. In January 2017, we will introduced 4K · HDR compatible broadcasting trucks, we vigorously promote broadcasting of sports and music live by 4K · HDR, and program production.



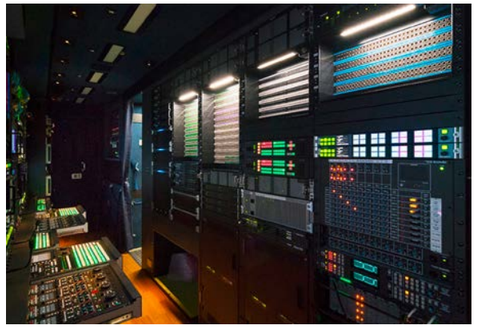
Inside View

SPBC

Production Area

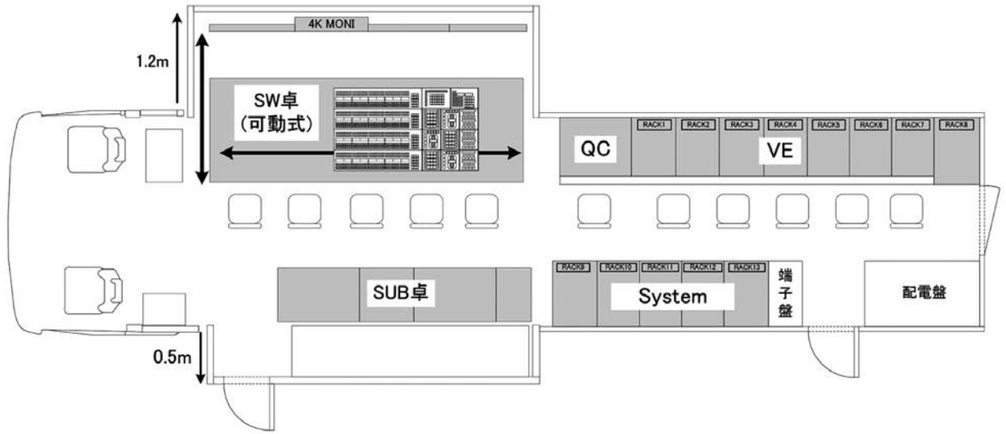
Camera Shading

SloMo Desk



Equipment Racks

Sports Production



SPBC

Dual Expando: 11m Long, 3,6m High, 2,5m Width – Expands to 4,2m, Weight 19,9t
Shifts between 4K/UHD+HDR S-Log 3 | 1080p

TECHNICAL SYNOPSIS

SPBC 4K HDR

OB Truck

Video

- 8x Sony HDC-4300 Cameras permanent (max. 20 cameras)
- Fiber Connectors from Lemo
- Lenses from Canon
- Tripods from Sachtler
- Vision Mixer Production: Sony XVS-8000 4M/E with 40 Inputs
- OnBoard DVE with 4Ch DSK
- Main Panel 3M/E, Sub-Panel 2M/E
- Monitors: 2x BVM-X300 and 6x KJ43X-8300D
- Multiviewer: Tomoei MV-4200
- Monitors Shading Area: 1x Sony BVW-X300, 4x PVM-A170,
- Multi-Format Converter: Sony HDRC-4000
- Harddisk / SloMo Server: 2x EVS XT4K
- 10Gb, 3Gbs SDTI, and GigE Network
- Video Router: Tomoei MFR-8000 4K 64 x 64 / HD 144 x 144
- Audio Router: Tomoei MFR-8000 112 x 112
- Optical Multiplexer: Otari LWB-64

Audio (is located in second truck)

- Audio Mixer
- Audio Monitoring:
- Microphones
- Audio Measurement:

Intercom/Communication

- Matrix: Riedel Artist 128 x 128

System Integrator

- Sony

Multi-Purpose Area

TELEGENIC

LIVE PORTRAIT

T5

OB Truck

General Contact

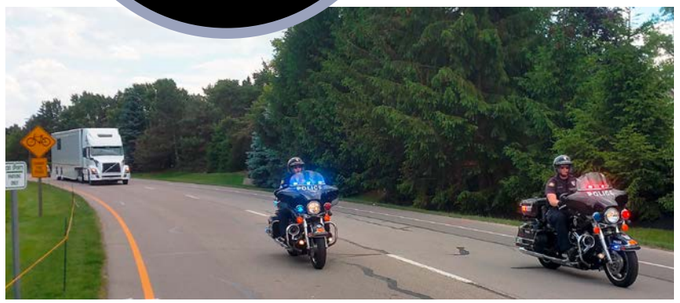
Telegenic US office

129 Bethea Road Suite 403
Fayetteville
30215 Georgia
United States of America

Andrew Wisniewski
andrew.wisniewski@telegenic.co.uk

Eamonn Curtin
+44 1494 557 400
Eamonn.Curtin@telegenic.co.uk

http://telegenic.co.uk/

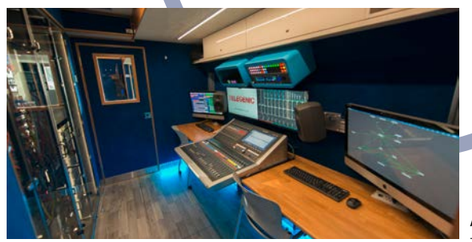


Telegenic T5 is a multi-purpose production vehicle. The double-expando 53' trailer is spacious with multiple rooms that can be configured to fit your broadcast needs.

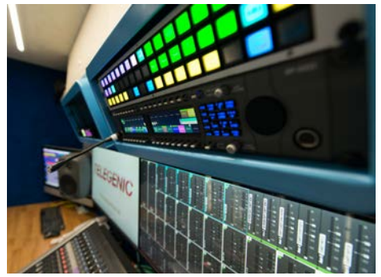
T5 can be used as a support vehicle with state of the art large green room, announce booth and multiple office rooms, negating the need for the use of mobile office trailers. It is also well suited for small technical productions with large space requirements.

T5 offers the cutting edge technical equipment for the internal and external operations of the vehicle. Technical staff will be familiar with the RTS intercom and Calrec Brio audio equipment as well as Dante audio. Riedel MediorNet nodes can easily be deployed to connect to other mobile units via fiber. Production and technical staff will appreciate the unique features of the trailer, such as quiet air-conditioning and heating with per room control; hydraulic auto-levelling and expando control allow for extremely fast and easy set up and strike times.

Sound Area



Multi-Purpose Area 2

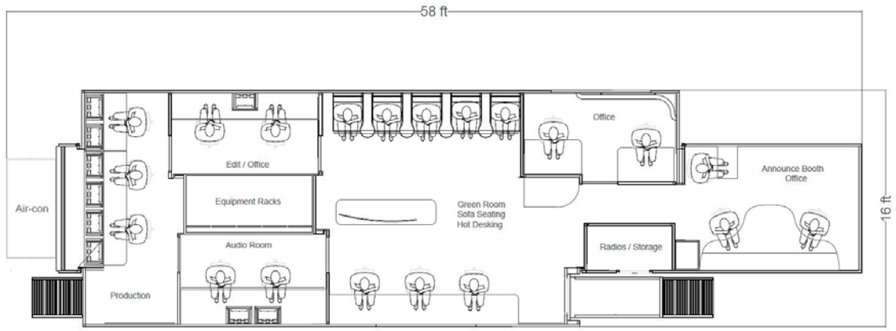


Calrec Brio 36

Green Room

Announce Booth

Riedel MediorNet



TELEGENIC

Equipment Specifications Telegenic T5
Double Expando: 16,15m Long, 4,14m High, 2,62m Wide
– Expands to 4,8m
Shifts between 1080i | 720p

TECHNICAL SYNOPSIS

T5

OB Truck

Video

- Cameras only available on Request
- Vision Mixer: Grass Valley SAM Kula 2M/E
- Riedel MediorNet Multiviewer
- 2x EVS XT3 12 Ch Full Editing Replay Servers
- Video Matrix: Riedel MediorNet; 156x156, 128 synchronizers
- Lawo VSM Video Controller, redundant Servers

Audio

- Audio Mixer: Calrec Brio 36
- Audio Matrix: Riedel MediorNet Audio Routing with 128 audio embedders and 128 audio de-embedders, 28 x 64ch MADI with SRC
- 2x Focousrite RedNet 6, Dante to MADI converters
- 32 x 32 Analog I/O, 64 x 64 AES I/O
- Dante controller
- Audio Monitoring: Genelec, 5.1 Surround Sound
- Multi-Track: SpotOn! Audio Playback
- Audio Effects: Cedar DNS-8Live
- Microphones from Sennheiser SMK-5200, Electro-Voice EV RE-50 Dynamic
- Glensound Inferno Commentary Boxes via Dante

Intercom/Communication

- Matrix: RTS ADAM-M
- 16 x 16 Analog I/O
- 16 x 16 MADI I/O
- 64 x 64 Dante I/O
- RTS TM-10K Trunk Master (IP & Serial connections)
- 4x RTS BRT Wireless Intercom Stations
- 4x StudioTech Dual Channel Dante Intercom Beltpacks

System Integrator

- Telegenic
- Wire Guyz for Csbling

PROFESSIONAL SHOW unitONE

LIVE PORTRAIT

unitONE

OB Truck

General Contact

One TV S.r.l.

A Professional Show Group Company
Via Praimbole 15
35010 Limena
Italy

Andrea Gianolli
CEO & Head of Operation

Tel: +39 335 5955 312

a.gianolli@one-tv.it
http://www.one-tv.it/

unitONE is one of the largest OB-VAN in the European broadcast market, integrated with the most advanced technologies.

All this thanks to the optimized design of the interior spaces, and to a careful selection of the equipment. This is the result of thirty years of experience of the staff employed in its realization, as well as an entrepreneurial strategic vision that looks at the productions of the future.

WIDE and ORGANIZED SPACES: With its 72m2 of available surface, offers 8 separate, yet adjoining operating areas, capable of accommodating 33 operative stations. Through a dedicated access, two auxiliary audio and video control rooms are provided, ideal to host supplementary productions to the HOST BROADCASTING service, without the need for an additional OB-VAN.
FLEXIBILITY: unitONE has been designed to meet the many needs of any type and level of production. Its ergonomic arrangement is particularly valuable, providing the maximum accessibility to all operating audio / video equipment.

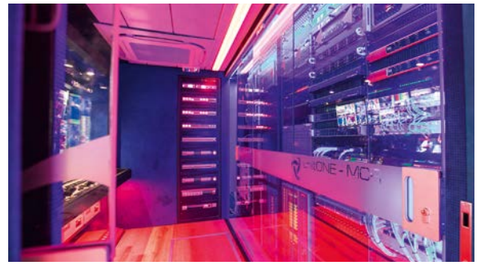
Production Area

Sound Area

unitONE

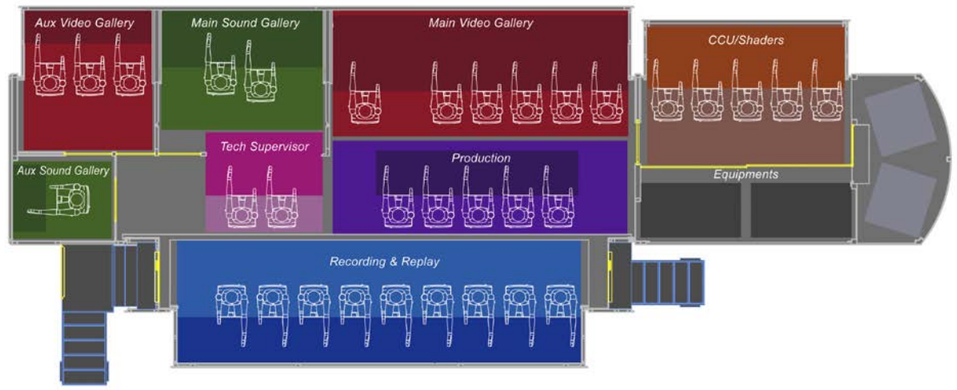
Camera Shading Area

Rec/Replay Desk



2nd Production Area in VMU

Supervisor



unitONE

Equipment Specifications The Alliance unitONE
Triple Expando: 16m Long, 4m High, 2,5m Wide – Expands to 6,5m
Shifts between UHD – HDR | Super SloMo | 1080p | 1080i | 720p
UHD Production without any down conversion of the the feed (with or without integration by AUX VIDEO GALLERY) in HD. SDR or HDR

TECHNICAL SYNOPSIS

unitONE

OB Truck

Video

Up to 30 GVG LDX-86N or Sony HDC-4300 or Ikegami HDK-79EXIII
Fiber Connectors from Lemo
Dark Fiber (20Km) with 30 GV SHED with HDX plus for Sony/GC/Ikegami
Lenses from Fujinon,
Tripods from Vinten
Vision Mixer:
Grass Valley HD Kayenne K-Frame Switcher 9M/Es
2 Panels: Kayenne 4M/E, Karrera 3M/E
316 Pictures in Production Wall
Monitors in Production Area: 9x 55" LCD 4K, 7x 49" LCD 4K, 11x 32" 4K, 4x 24" LCD G1-1x 32" LCD G1 HDR
Multiviewer: Evertz (Part of the Router)
Monitors in Camera Shading Area from Sony 4x BVM-E171 HDR, 1x SONY BVM-X300/2 UHD HDR
2x Sony HDRC-4300 (OnAir Matching)
Servers available: EVERTZ DREAM CATCHER, EVS XT3/4, GVG DYNO/SUMMIT
10Gb, 3Gbs SDTI, and GigE Network
Digital Glue from Evertz
Video Matrix: Evertz EQX 576 x 576
Measurement Equipment: Tektronix 8300 4k/HDR Plug-In

Audio

Audio Mixer: 2x Stage Tec Crescendo Platinum 48 Fader + 24 Fader
Audio Router: Stage Tec Nexus Star
MADI Router: Evertz EMR 3060 x 3060
Audio Measurement: 2x TSL PAM1-MK2- Dolby
Audio Monitoring: Genelec – Dynaudio – K-Array Certified for 7.1 Listening in MAIN AUDIO and 5.1 IN AUX SOUND GALLERY
Microphones from Sennheiser, Holophone, Soundfield, DPA, Shure Wirekess Mics: Wysicom

Intercom/Communication

RTS Intercoms
ADAM-M w/OMNEO (AES67/AES70), Dante OCA
KP series Keypanels with full AC control
ROAMEO wireless dect intercom
MADI64 to the audio desk

Power Required

400V, three phase, 1x 124A or 3x 63A

The Eurovision Song Contest (ESC), already running for 63 years, is one of the most debated, loved, and hated entertainment formats ever created and ESC has grown to become a true annual behemoth in live TV production and a cultural phenomenon around the world. Since the contest started to be widely promoted on social media and streamed live on the Internet, the originally European base of ESC's fan base has evolved globally, conquered millions of additional viewers in Asia, South America, and North America, and participating countries, which recently expanded to include Australia.

When the contest goes live - currently with 43 countries, forcing Eurovision to broadcast two semi-finals and one final - every song has those same 3 minutes on stage to impress.

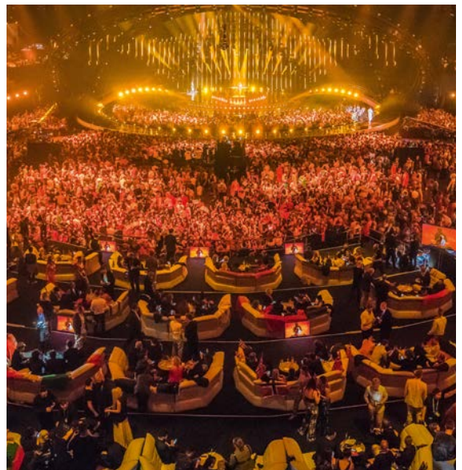
Eurovision SONG CONTEST LISBON 2018

Every year since its early inception, the ESC format represents the most formidable challenge in live television production, far surpassing any other format, including the Olympic opening ceremonies or even the Super Bowl. Because this is about live music, an endless parade of 43 countries live on stage and on-air, representing the millions of viewers in each country - with all the political and cultural extent - the pressure for the production teams is tremendous.
And to make matters worse, this is followed by the always entertaining and nerve-wrecking voting process, where all countries have to submit the results of their vote - creating a massive infrastructure for bidirectional live contribution links, which is precisely what the Eurovision broadcast network (EBU) represents after all.

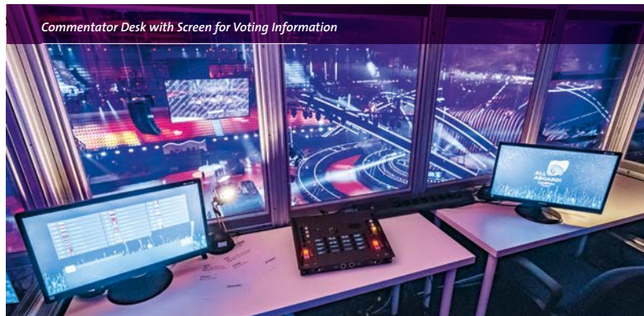
EBU had tasked wTVision (part of Mediapro) to design the Host Voting System. The project included wTVison's PCR solution that combines Studio CG and the R3 Space Engine (real-time 3D graphics engine) as well as a team of six operators. The voting data was imported in real time, integrating with the official provider, and the graphics were implemented by wTVision's broadcast design team.

To guarantee the maximum efficiency of the live show, wTVision also developed a project specifically for Eurovision Song Contest, called the Host Voting System. Thanks to a web technology setup, directors and hosts of the show were provided with valuable information, such as qualified countries, countries currently voting and, eventually, the confirmation that Israel was the winner of the Eurovision Song Contest 2018. The voting information was also provided to the commentators from the 43 participating countries.

ESC 2018 was presented by Silvia Alberto, Daniela Ruah, Catarina Furtado and Filomena Cautela



EBU Voting Control Center



Commentator Desk with Screen for Voting Information

Management of the more than 100 Wireless Audio Channels by Sennheiser

Sennheiser Supplied Wireless Digital 600 Micriphones to ESC

Altogether, more than 100 wireless channels were in use for audio alone. An ideal environment for Sennheiser's Digital 6000 to demonstrate its spectrum efficiency. All artists relied on Digital 6000 microphones and used either SKM 6000 handhelds with MD 9235 dynamic capsules, or SK 6000 bodypacks with Sennheiser custom headmics. For wireless monitoring, 2000 series systems were on duty: Rack-mount SR 2050 IEM two-channel transmitters transmitted their signals via A 5000-CP circularly polarised antennas to the artists' EK 2000 IEM bodypack receivers. A large number of bodypacks ensured that all artist groups and the technical crew could be provided with high-quality audio signals.

For backstage communications, the new Command function of the 6000 series was being used to enable the ESC's technical team to establish talkback links, for example for the stage director or the liaison manager. For this, the crew used special SKM 9000 COM handheld transmitters or SK 6000 bodypack transmitters that have been Command-enabled via the KA 9000 COM Command switch.

Sennheiser equipment on site

- 41 EM 6000 two-channel receivers
- 74 SK 6000 bodypack transmitters
- 68 SKM 6000 handheld transmitters, with MD 9235 capsules for the artists and KK 204 capsules for communication purposes
- 115 custom Sennheiser headmics
- 6 SKM 9000 COM handheld transmitters
- 6 KA 9000 COM Command switches
- 21 L 6000 rack-mount charging units with chargers for SK 6000 and SKM 6000/9000
- 17 SR 2050 IEM two-channel transmitters
- 112 EK 2000 IEM bodypack receivers

Riedel Deliverables for ESC

Continuing a 13-year tradition, Riedel Communications again supplied a massive, all-fiber communications and signal distribution system for Eurovision Song Contest 2018. However opposite to previous years where Riedel was engaged on a year by year basis, in 2018 EBU and Riedel agreed on a three years contract. In addition to the provision of radios and, intercom panels, commentator panels and fibre backbone with MediorNet for signal distribution, the contract includes the delivery of the accreditation and access control system, an entire IT solution with WiFi distribution for the whole production team including the accredited press (hardware, service and Cyber Security package). This makes Riedel a one stop for the ESC's production digital eco system.

Riedel's MediorNet real-time media network provided redundant and decentralized signal routing and transport from start to finish. Through tight integration with MediorNet, Riedel's Artist digital matrix intercom system and Bolero wireless intercom provided comprehensive and reliable communications for crew and performers. For all broadcasts, including semifinals 1 and 2 and the Grand Final, Riedel supplied the signal and communications backbone for Videohouse, which produced the show's world feed on behalf of EBU and Portugal's public broadcasting company, RTP.
Deployed in a decentralized configuration, Riedel's MediorNet network ensured fully redundant distribution of all video and audio signals for commentary, intercom, signal distribution, and radio communications, including the feeds for monitors in commentary booths and for displays and projectors in the Altice Arena. Crew communications were facilitated by a robust intercom system anchored by four more Artist 64 mainframes and more than 100 Artist RCP and DCP intercom panels. The Artist panels provided fully redundant, decentralized distribution of all Bolero wireless intercom signals, with 32 Bolero beltpacks deployed to the production team. Bolero's Advanced DECT Receiver (ADR) technology ensured clear communications throughout the Altice Arena using only six AES67-networked antennas. The Artist infrastructure also supported almost 600 Hytera and Motorola TETRA handheld radios.

Jon Ola Sand, Executive Supervisor ESC and Thomas Riedel, CEO Riedel Communications

Riedel's MediorNet Real-Time Media Network Provided Redundant and Decentralized Signal Routing and Distribution

For the first time at the Eurovision Song Contest, Riedel deployed a complete solution based on Session Initiation Protocol (SIP) to support commentary booths for almost 30 countries covering the contest for their local audiences. Anchored by four Artist 64 intercom mainframes and 40 Artist CCP-1116 commentary panels, the system used Cymatic Audio's uTrack24 devices, loaded with Angelbird SSD hard drives, to manage line IDs for the commentary booths.

In this regard, Riedel introduced SIP for the first time at ESC this year, replacing ISDN lines for commentators whilst providing much better audio quality at the same time.
In addition, Riedel provided an access control system designed to simplify guest and crew entry into the arena, boost security, and provide efficient visitor management. The system required personnel to pass through turnstiles where their accreditation cards, embedded with RFID chips, were swiped with stationary or wireless reading devices, and the RFID data was matched to an online database. Also, Riedel once again worked with partner TPO to provide a comprehensive IT and infrastructure, including all switches, servers, 170 wireless access points, for up to 2,000 journalists in the press center and a comprehensive Cyber Security Package.
Team Riedel for ESC 2018 comprised of 25 people, including project and program management and specialized engineers.

Riedel Equipment on site

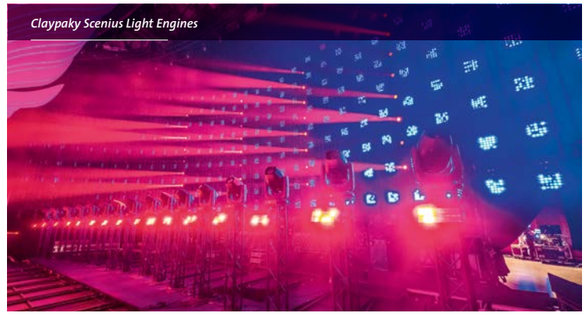
Intercom
4 Artist 64 intercom Mainframes
67 RCP-1128 Intercom Panels
10 RCP-1112 Intercom Panels
24 DCP-1116 Intercom Panels
6 Bolero Antennas
32 Bolero Beltpacks

Commentary
4 Artist 64 intercom Mainframes
40 CCP-1116 Commentator Panels

Hub
MediorNet system
6 MetroN Frames
30 MicroN Frames
24 Modular Frames

Radio
300 Hytera PD605 Handheld Radio
260 Motorola Tetra Handheld Radio

IT Services
170 Access points
Accreditation
20 Turnstiles + Viewing Stations
5 Accreditation Work Stations

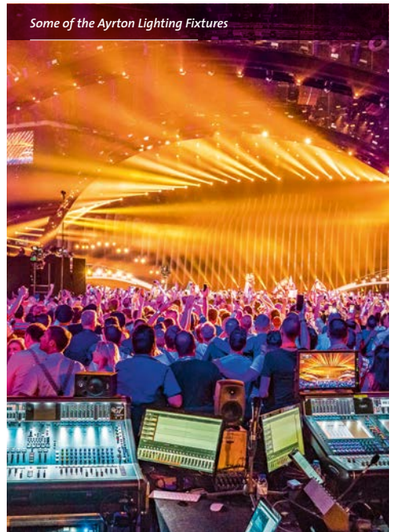

Claypaky Scenius Light Engines

More than 800 Claypaky entertainment fixtures

The spectacular light shows for the Eurovision Song Contest have been created using many products from Claypaky. At ESC 2018, the staging for the artists will included 750 moving lights from Claypaky together with around 50 static lights from ADB. One of the highlights was the Axcor Profile 900, which was making its official debut in Lisbon. This LED-based profile spotlight from Claypaky is the most advanced of its type on the market. Its powerful 880 W pure white LED light engine delivers 46,000 lumens. There were also more than 300 products from the Scenius family on the ESC stage. They were all equipped with highly efficient 1,400 W lamps from Osram, specially developed for such demanding applications. The contestants in the Eurovision Song Contest were also be lit by Claypaky's Hepikos, a hybrid beam/wash light equipped with an Osram HRI Sirius 440 W lamp and by the new ADB Klemantis, an asymmetrical cyclorama light based on a six-color LED module.

Ayrton adds architecture to Appelt's Eurovision splendour

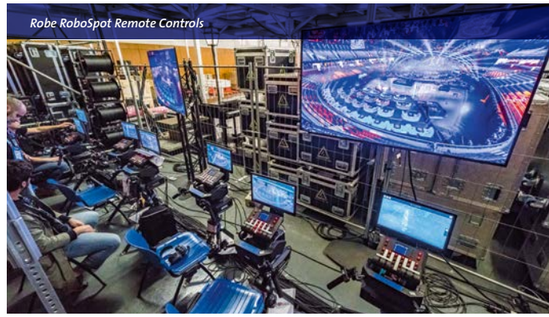
Lighting designer, Jerry Appelt, chose more than 700 Ayrton fixtures for his stellar design. Appelt chose not to incorporate any video element in the show, instead returning to a lighting-based design in which Ayrton fixtures were a key creative feature adding depth, architecture and variety to the visuals. With over 2000 fixtures using 300 universes and 150,000 channels, Eurovision is the biggest production in the world and demands the highest production levels.


Some of the Ayrton Lighting Fixtures

Lighting Controlled by:

3 Grand MA 2 sessions, running with; 10 Grand MA 2 full size consoles, 5 active, 5 back-up in network
4 Grand MA 2 light, 2 video, 2 tech ops
39 Grand MA 2 NPU
3 Grand MA 2 VPU MKII
2 Green Hippo Boreal+ Media Server
16 ELC GBX-8 port nodes

... and controlling:
63723 mx parameters for moving lights
82114 dmx parameters for pixel mapping and backwall of 351x Ayrton Magic Panel FX
3314 dmx parameters for hippotizers
158 universes for moving lights
88 universes for the backwall of 351x Ayrton Magic Panel FX
80 universes rgb pixels in set


Robe RoboSpot Remote Controls

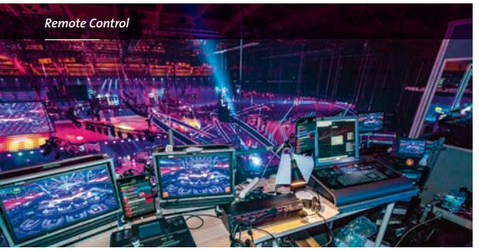

Robe RoboSpot Effects

"The exemplary cooperation with Ayrton was vital for the success of the show and the almost 800 fixtures from Ayrton gave Jerry an important addition to his toolbox, enabling him to create a magnificent, multi-layered design that was absolutely needed to master this beast without having LED screens or any other video canvas in our set up," says ESC Head of Production, Ola Melzig. "And guess what, we did not miss video for a second of the whole of the spectacular broadcasts we created in the wonderful city of Lisbon."

Large RoboSpot System is a Winner at Eurovision 2018

Seventeen Robe RoboSpot Base Stations controlling/tracking Robe BMFL fixtures provided a comprehensive remote follow spotting solution for production lighting designer Jerry Appelt at the ESC.
The RoboSpot system was specified onto the show by Jerry and his gaffer Matthias Rau, and used extensively throughout the event's nail-biting final and two live semi-finals, which were beamed and streamed live via host broadcaster Rádio e Televisão de Portugal (RTP), reaching a final worldwide audience of around 200 million.
The technical implementation for the 63rd ESC took visual imagination to new levels of ambition and excellence for both broadcast and live staging. Under the direction of Ola Melzig and Tobias Åberg who headed the large, highly talented technical teams, production values soared to new heights. The RoboSpot system was supplied by main lighting contractor Flashlight from the Netherlands, who worked in conjunction with Pixelight from Portugal.
The RoboSpots, each with individual MotionCameras, were all from Robe's powerful BMFL series of moving lights – a mix of BMFL Blades and BMFL WashBeams. Having these on the rig for key lighting and highlighting with their intensity and high CRI helped produce excellent results and perfect flesh tones.
They were positioned around a variety of overhead vantage points which meant Jerry was not restricted to using one set of follow spots in a specific location / direction to highlight every performer in every shot.

With songs from 43 countries to light individually and uniquely, this follow spotting system greatly increased the flexibility at his fingertips. He could mix and match the available follow spots to get this essential element precise and exactly to his liking and for what worked best on camera and onstage.
BMFL Blade luminaires were rigged to one of the front trusses with two more single fixtures on side trusses left and right of the stage.
BMFL Blades with one MotionCamera per pair of fixtures, were positioned on an upstage truss and used for rear following, highlighting and silhouetting.
Two more single BMFL WashBeams were rigged on trusses right at the far end of the arena and used for long throw shots and presenter pick-ups. Again the power of the BMFL was ideal for this application.
Another two paired sets – a BMFL WashBeam and a BMFL Blade running with one MotionCamera each - were located over the stage and used for spotting people, interviews and other activities happening in the Green Room which was set up at the end of the arena furthest from the stage.
Cutaways showing the tension and emotions building in the Green Room are a fundamental element of the Eurovision drama and TV coverage, so spotting this area properly is as crucial as ensuring the performers onstage are properly lit.
The 17 x RoboSpot BaseStations were all located in a designated backstage area, so the operators had no direct view of the stage.
Robe Deutschland's Martin Opitz was the RoboSpot systems engineer and co-ordinated the training and technical support. His first task on arrival in Lisbon a few weeks ahead of the final ... was to train up 17 locally based operators to work the RoboSpots.
Martin was impressed with how quickly they learned the system and its philosophies. "After 30 minutes, they had the basics and we all moved forward from there. The more familiar they became with the equipment, the smoother the whole follow spotting operation became," commented Martin.


Remote Control


RailCam and Camera with Box-Lens

He collaborated closely with the production's follow spot caller Torsten 'Icke' Berger and keylight operator Markus Ruhnke to ensure they achieved all the required shots.

The RoboSpots were a great success.

Flashlight's commercial & operational director Dennis van der Haagen said that the feedback they received indicated everybody was impressed with the performance of the lighting rig generally and the RoboSpot system as a key part of it.
The striking set for ESC 2018 comprised an elegant series of interlinking geometric curves and spheres accentuated with different LED sources providing a universal architecture which was designed by Florian Wieder.
Jerry worked alongside his own hand-picked FOH team including assistant LD Andreas Türpe and in addition to Matthias, Icke and Markus mentioned above, MA3D operator Jan Suiling, audience lighting operator Raphael "Grebi" Grebenstein and show lighting operator Raphael Demonthy.
Sebastian "Huwi" Huwig operated the back-wall of LED Panels while Nick "Nick the Greek" Charalampidis looked after media server operation for all the delegation's video content.

Lighting Fixtures by Brand/Type:

26 active dmx controlled camera light	*180 GLP X4 L (around arena, audience)*
112 Clay Paky Scenius Profile	*262 GLP JDC-1*
197 Clay Paky Scenius Unico	*64 GLP KN-V Arc (8 full circles)*
45 Clay Paky Axcor 900	*8 GLP X4 Bar 20*
86 Clay Paky Hepikos	*20 SGM P2*
169 Clay Paky Sharpy Wash	*89 SGM P5*
143 Clay Paky Mythos 2	*21 SGM P10*
20 Clay Paky Mythos 1 (performance)	*36 Portman P1*
50 ADB Klemantis	*12 Portman P3*
64 Ayrton Mistral (back wall)	*Nova Flower 2k*
112 Ayrton Ghibli (audience)	*17 Robe Robospot base station (operating 22 follow spot positions)*
60 Ayrton Nando Beam S6	*19 Robe Robospot Motion Cam*
351 Ayrton Magic Panel FX (big backwall)	*22 Robe BMFL Blade*
96 Ayrton Mini Panel FX (in front stage)	*4 Robe BMFL Wash-Beam*
30 Ayrton Magic Dot SX (at front stage)	*60 various work lights*
*68 Vari*Lite VL 4000 Wash-Beam*	*231 various spare fixtures*
32 Philips Show Line SL 720 ZT	*1 Robe Dominator 1200 XT*

Together they crafted an exciting and invigorating lightshow that worked harmoniously with the video and scenic LED aspects.
The multicamera directors from RTP were Paula Macedo and Pedro Miguel Martins and they worked alongside Troels Lund as senior multicamera director for the production.
With songs from 43 countries to light individually and uniquely, this follow spotting system greatly increased the flexibility at his fingertips. He could mix and match the available follow spots to get this essential element precise and exactly to his liking and for what worked best on camera and onstage.
BMFL Blade luminaires were rigged to one of the front trusses with two more single fixtures on side trusses left and right of the stage. BMFL Blades with one MotionCamera per pair of fixtures, were positioned on an upstage truss and used for rear following, highlighting and silhouetting. Two more single BMFL WashBeams were rigged on trusses right at the far end of the arena and used for long throw shots and presenter pick-ups. Again the power of the BMFL was ideal for this application. Another two paired sets – a BMFL WashBeam and a BMFL Blade running with one MotionCamera each - were located over the stage and used for spotting people, interviews and other activities happening in the Green Room which was set up at the end of the arena furthest from the stage.

Cutaways showing the tension and emotions building in the Green Room are a fundamental element of the Eurovision drama and TV coverage, so spotting this area properly is as crucial as ensuring the performers onstage are properly lit. The 17 x RoboSpot BaseStations were all located in a designated backstage area, so the operators had no direct view of the stage. Robe Deutschland's Martin Opitz was the RoboSpot systems engineer and co-ordinated the training and technical support. His first task on arrival in Lisbon a few weeks ahead of the final ... was to train up 17 locally based operators to work


Videohouse HDone OB Truck Production Area


Videohouse HDone OB Truck Camera Shading


Videohouse HDone OB Truck Sound Area

the RoboSpots. Martin was impressed with how quickly they learned the system and its philosophies. "After 30 minutes, they had the basics and we all moved forward from there. The more familiar they became with the equipment, the smoother the whole follow spotting operation became," commented Martin.
He collaborated closely with the production's follow spot caller Torsten 'Icke' Berger and keylight operator Markus Ruhnke to ensure they achieved all the required shots. The RoboSpots were a great success.
Flashlight's commercial & operational director Dennis van der Haagen said that the feedback they received indicated everybody was impressed with the performance of the lighting rig generally and the RoboSpot system as a key part of it.
The striking set for ESC 2018 comprised an elegant series of interlinking geometric curves and spheres accentuated with different LED sources providing a universal architecture which was designed by Florian Wieder. Jerry worked alongside his own hand-picked FOH team including assistant LD Andreas Türpe and in addition to Matthias, Icke and Markus mentioned above, MA3D operator Jan Suiling, audience lighting operator Raphael "Grebi" Grebenstein and show lighting operator Raphael Demonthy.
Sebastian "Huwi" Huwig operated the back-wall of LED Panels while Nick "Nick the Greek" Charalampidis looked after media server operation for all the delegation's video content. Together they crafted an exciting and invigorating lightshow that worked harmoniously with the video and scenic LED aspects. The multicamera directors from RTP were Paula Macedo and Pedro Miguel Martins and they worked alongside Troels Lund as senior multicamera director for the production.
ESC 2018 was presented by Sílvia Alberto, Daniela Ruah, Catarina Furtado and Filomena Cautela, and was won by Israel's hotly tipped Netta Barzilai with her song "Toy", with Cyprus finishing second and Austria third.
Preparations at the Altice Arena started as early as October 2017. The dedicated team of commercial, technical and logistics specialists, working closely together with local Portuguese partner Pixel Light, laid a solid base for a flawless production in the Altice Arena. Build up started early April and ended with a 60-hour speed load out.
Over 2500 fixtures, almost 4 kilometres of truss and a huge amount of, cabling, dimmers, distro's and a state of the art data network was used in this massive TV production attracting over 350 million viewers worldwide.
The lighting fixtures were supplied and installed by Ampco Flashlight along with the full lighting, rigging (including the customised backwall), motion control and video package. Project directors Marc van der Wel and Marco de Koff, and senior project manager, Ruud Werkhoven, worked together with local Portuguese company, Pixel Light to get everything in place. "It was a pleasure to work with Jerry's team and experience his professionalism in a project which has the highest production levels and hits the boundaries of possibility for networking," says van der Wel. "It was a complex, challenging production – technically, artistically and politically - and very exciting for our people to be involved. We had good service and support from all the manufacturers. We learned a lot and had great fun!"

Video gear:

7	*Panasonic RZ31K 31k laser projector (mapping projection for various performances)*
2	*Barco HDX W20 Flex 20k projector (performance Belgium)*
6	*Panasonic PT-DZ21K1 21k projector (broadcast to audience)*
32	*ROE CB3 3,75 mm carbon LED panels (performance Malta)*
256	*ROE S18 900 mm LED Strip units (performances Sweden, Australia)*
3628	*meter LED Strip Studio striplight single pixel RGB (light boxes in set, in spheres and ribs)*

Motion Control system:

46	*CyberMotion CyberHoist 2 (moving 15 lighting elements)*
2	*MotionCue3D CyberMotion control systems*

EUROVISION SONG CONTEST LISBON 2018

AMPCO FLASHLIGHT · AYRTON · CLAYPAKY · PIXEL LIGHT · RIEDEL · ROBE · SENNHEISER · RTP · VIDEOHOUSE · wtvision

Eurovision Song Contest 2018, Photo Credits: ***© Ralph Larmann | www.larmann.com***

The show is about to start in Cologne.
A laid-back Carsten Kümmel checks all the AURUS settings.

Hans Zimmer Tour: Sound reinforcement for Maestros Complex live sound reinforcement on tour in Germany with AURUS

Orchestral concerts belong in good concert halls. The audience is enveloped in direct sound and room acoustics, and enjoys a good view of the orchestra even from the back seats. It's the environment for which most orchestral pieces were composed and which can be deeply moving when the work, performance and space merge into a single, sublime union.

But what to do for a large orchestral show celebrating the 60th birthday of one of the most famous and influential film composers of our time? With works that were never composed for the stage? The newly arranged tour playing large sports halls with a symphonic orchestra and multi-instrumental band? This is exactly the challenge faced by "The World of Hans Zimmer", which is touring Germany's largest sports halls in 2018, with a few detours to Switzerland and the Netherlands thrown in.

A vast panorama

Carsten Kümmel, a graduate Tonmeister from Munich, Germany, has a reputation for helping major works achieve great sound in even bigger venues. He does this so convincingly that since 2014 he has been supervising the University of Darmstadt's PA and Live Recording faculty as a professor. Behind the FOH desk, a Stage Tec AURUS, he exudes calm, even as the fourth performance of the tour is about to begin in Cologne.

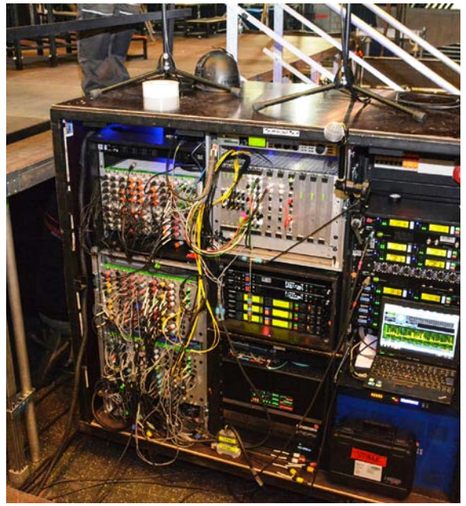
A calm rooted in meticulous preparation. As sound designer of the show — its bombastic storyboard defies the description concert — he has spent six months planning how the technical side of the sound should be implemented. "The last four weeks before the premier were the most intense," recalls Carsten.

At the start of the planning process there was the fundamental question of how to achieve a reasonable panoramic experience on a stage 24 metres wide for an audience of 12,000. On that scale, the classic left-right pan control is unsatisfactory for most of the audience. In extreme cases, for instance, somebody seated on the right edge would not hear the instruments positioned on the far left of the stage. The musical performance would be very unbalanced toward the edges and in the front rows especially. Carsten is very experienced in these scenarios. So, how to mix full stereo without getting those extreme balance mismatches. For about ten years now, he has been working with his own method, which he describes as a spectral panorama.

mixing MATRIX with eight pan Strips

For the front rows, which are particularly sensitive in terms of the panorama image, he goes even further and uses a kind of spectral delta-stereophony. To do this he first divides the stage into different zones. On the Hans Zimmer Tour there are 3 X 8 squares, eight along the front edge of the stage and three deep to the back. In addition to the main speakers flown above, a near fill monitor is positioned at the front edge of the stage in each of the eight resulting strips to ensure localisation in the front section of the audience. Instead of mixing a signal from left of stage loud on the left stage monitor and correspondingly much quieter on the far right stage monitor, Carsten filters the high signal components. The further away the signal source is from the respective stage edge monitor, the more the high frequencies in the source are attenuated. The signal is also delayed so that it arrives at the viewer later. And for good measure, Carsten also reduces the level, just a little. The principle is based on the actual physical conditions, because even in nature, more distant sources sound duller and reach our ears with a time delay and lower volume.
The large symphony orchestra and the band's multi-instrumentalists sit on the stage arranged across the 3 x 8 squares. Each musician's position on stage is defined precisely with gaffer tape and is always the same in every venue.

FOH console AURUS



Three NEXUS Base Devices and a NEXUS STAR at the edge of the stage

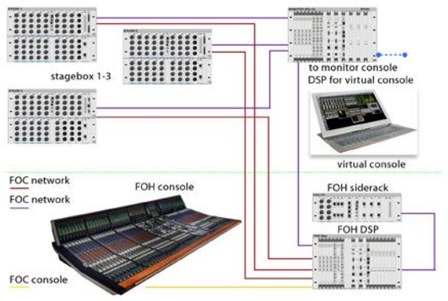
The instruments within a square are all treated identically in terms of pan presentation, i.e. they are all filtered, delayed and equalised in the same way. Instead of a normal pan pot in each mixer channel Carsten requires a mixing matrix with 193 input signals and 8 outputs. "For this task we actually use our own mixing console. A normal router matrix such as the Stage Tec NEXUS, which we are using here, could handle the volume and delay at the cross-point. But the exact spectral filtering, the critical attenuation of the more distant sources' high frequencies, wouldn't have been possible," explains Carsten. Instead of a real, physically present mixing console, Carsten uses a second Stage Tec AURUS, which is controlled via a so-called virtual console. "The settings are calculated meticulously and programmed in advance; they are static. We don't have to operate this virtual mixer during the show, and can save both the space and cost of a physical desk. Our virtual console is only controlled by an external PC," adds Carsten.

Mixing network with virtual and physical mixing SURFACES

This approach is possible because the audio system is arranged as a mixing network. The main systems are from Berlin-based digital pioneer Stage Tec, which has been a champion of distributed mixing networks since the beginning of audio digitisation. The system is based on a NEXUS audio network. It consists of two NEXUS STARs, i.e. very powerful audio routers, which as the main hub, form the basis of the double star topology network. One NEXUS STAR also hosts the virtual mixer processing for the pan matrix, while the other STAR hosts processing for the FOH console.

Both desks are digital Stage Tec systems from the AURUS platinum family. Three NEXUS Base Devices, each acting as independent, distributed routers, are provided for microphone inputs and the PA feed, one Base Device is at the FOH side rack. Additional MADI connections in the STARs supply the monitor mixer, a Midas ProX, with the FOH position's premixed stems.

The virtual mixer control runs on a computer in the background and is not needed during the show. Instead, the mix settings are uploaded to the corresponding NEXUS STAR's processor boards and remain static throughout the entire performance. Even if the control computer with the virtual user interface were to fail, the show would continue unchanged.



The NEXUS audio network for the tour

FOH with a VCA pyramid

In contrast, Carsten's FOH position features a large AURUS console with 48 channel strips, each with 11 dual concentric rotary encoders and many buttons. This gives him direct access to almost all important functions — a real life-saver in live sound reinforcement.

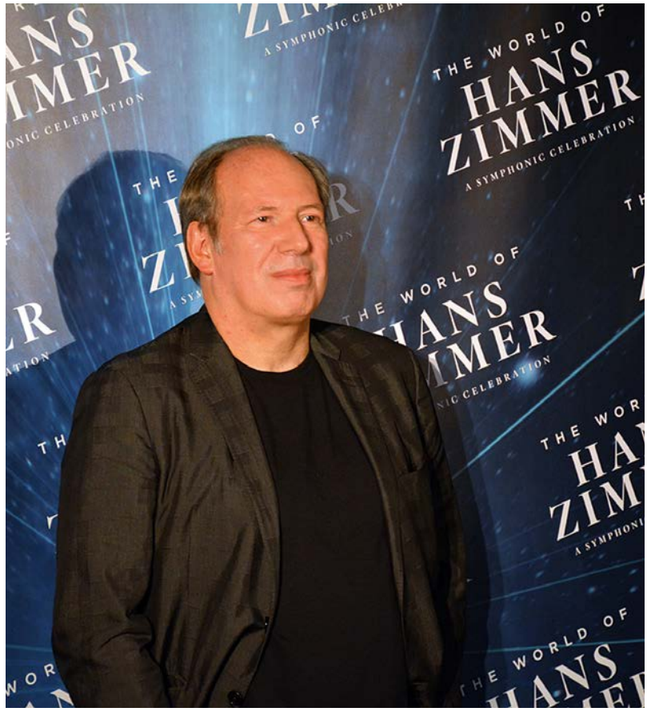
However, this is only relative because with 250 mixing channels, 128 buses and 48 faders, with one person to control them you quickly discover certain limits. Carsten has therefore established a strictly hierarchical treatment of his sources. He used the new AURUS VCA hierarchy function. For example, he combines all the cellos into a VCA group. In turn, this cello VCA group is combined with all other strings groups VCAs into a "strings" VCA group. This is part of the "orchestra" VCA group, and so on. He has, so to speak, built a pyramid with the individual sources at the lowest level and combines those into VCA groups, with each level containing fewer VCA groups. Carsten displays each of the top-tier VCA groups on the console surface. These are, for example, primary VCA groups for the orchestra microphones, the choir, the band, the soloists, effects and finally a VCA group of all signals.

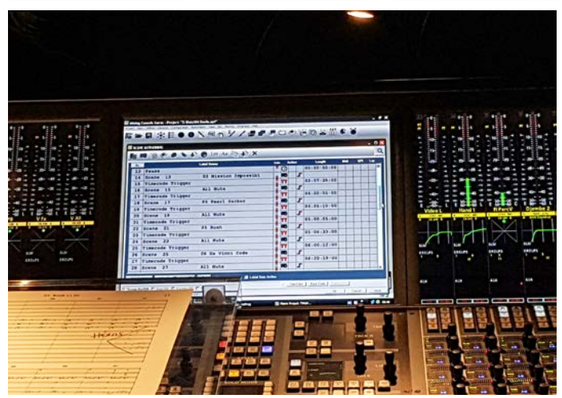
"I use the new VCA hierarchy to handle the profusion of channels. In this project we are no longer mixing individual channels, but almost exclusively VCAs combined with the spill function," emphasizes Carsten. This spill function, which has been integrated in AURUS for some time now, makes it possible to deal effectively with multiple control assignments. Pressing the spill button brings the background layer channels to the surface for editing. Carsten can make the appropriate adjustments, then press spill again to bring the main layer into the foreground. By combining this function with the VCA hierarchy, you can set up a very well-organised mixer project that — as here in the case of the Hans Zimmer Tour — enables rapid access to signals with a compact control surface, even with one person operation.

The primary VCA groups are placed together with the video recordings' sound on the top-level AURUS control layer.

Time code-triggered scene automation

Nevertheless, mixing the enormous number of signals from the orchestra, choir and 15-piece band remains a formidable challenge. The band change instruments, which makes the process even more demanding. Incidentally, for this large number of audio channels, the FOH console is fully equipped with seven powerful RMDQ DSP units. The microphones are converted to digital directly via the NEXUS' microphone inputs with 32-bit resolution using the patented True Match method without prior analogue amplification. 23 XMIC microphone boards with eight channels each, i.e. 184 microphone channels in total, are installed in the NEXUS Base Devices on the stage for this purpose.





Scene automation

Luckily, the entire show is planned in such a way that it is run strictly according to time code. This is absolutely necessary for the complex lighting and video controls alone. For Carsten this was a novelty. "This is the first time I've used the AURUS scene automation, and I created snapshots before the show, which I trigger with an external timecode. That means I don't have to think about everything during the show and can just concentrate on the music." Switching on the correct soloist microphones, controlling the instruments involved and the choir — all this is stored in the AURUS snapshots, leaving Carsten to make dynamic changes and adjustments to the programmed levels when required.

Bigger, better, faster...

Digital technology enables Carsten to pre-programme the router and mixer settings offline. "For a project on this scale, labelling every single source, destination and group is a must. Otherwise it can get quite confusing in a hectic situation with so many channels," Carsten notes. The entire project comprises about 1,200 cross-points!

After just three days of rehearsals, the show premiered. The fact that the AURUS automation snapshots can be edited offline certainly helped. The end of the premiere was the beginning of a rapid succession of shows, each day a new venue. In concrete terms this meant: Leipzig on Thursday, Nuremburg on Friday, Cologne on Saturday, Stuttgart on Sunday, Zurich on Monday. To save setup and teardown time, each musician mikes themselves up according to a standardised procedure and packs the mike for their instrument after each performance. In addition, Carsten also makes a multitrack recording of each show with the Reaper software, which he uses the next day to help set up the system in the new venue.

Not only is the sound so perfect and comprehensive, there are also video recordings on giant movable LED panels and a gigantic light show. The choir stands on three levels in towers to the left and right of the stage. Everything, including the stage props and trusses, fits into six articulated lorries which transport the equipment from one event to the next.

About the artist

"The World of Hans Zimmer – A Symphonic Celebration" could take up pages in its own right. Hans Zimmer knows exactly how to set the scene, both in music and in a show. He rearranged his works especially for orchestra for this show. Hans Zimmer also precisely defined visually stunning clips, some featuring film scenes or imaginative impressions. In interview sequences between the pieces, the composer comes across as an easy-going, likeable artist with a penchant for perfectionism. There is a reason why the Frankfurt native is today one of the best-known film composers of our time and is regarded as a great composer and producer in Hollywood. His blockbuster scores, including The Lion King, Rain Man and Sherlock Holmes, have earned him one Oscar, two Golden Globes, three Grammys

and countless nominations. "It was Hans Zimmer's idea to place the choir in three-storey towers to the left and right of the stage. When the choir isn't singing, the LED panels are moved in front of the towers. Brilliant staging, which emphasises that this production was about the result, not materials and costs," recalls Carsten, highlighting the driving force that is Hans Zimmer.

Orchestral concerts belong in good concert halls? "The World of Hans Zimmer – A Symphonic Celebration" has artistically rendered this physical law null and void — with the help of a team that can match Hans Zimmer's pursuit of perfection. In his shows, the audience finds itself amidst an eruption of music, video, lighting effects and dramatic highlights. It is a poignant moment when a work, performance and technology coalesce into such a consummately successful unity. Incidentally, the tour is set to continue in the second half of the year...

Author: Gabriele Betz, Tübingen

Stage Tec Entwicklungsgesellschaft für professionelle Audiotechnik GmbH, based in Berlin, specialises in the development and manufacture of innovative audio equipment. Stage Tec was founded in 1993 by 20 shareholders. Almost all the founders still work for the company today. Dr. Helmut Jahne, Managing Director of the company, is also one of the founding members of the Stage Tec team and continues to drive the technological dominance of the product lines with numerous patents and developments.

Stage Tec has an international reputation as one of the leading pioneers in the transition from analogue to digital audio technology, and has raised the bar in digital technology. In 2010, NEXUS was awarded the Emmy® Award, the most prestigious US television award, in Los Angeles, as the best routing system in the world. The introduction of the AURUS mixing console in 2002 marked an extraordinary success, which continues to this day with several hundred systems sold. AURATUS was introduced in 2006 and CRESCENDO in 2009 - two compact consoles for broadcast and theatre. The ON AIR flex broadcast mixing console was launched in 2014. The brand-new, IP-based AVATUS mixer will be ready for the market in 2019 and picks up on the trend towards IP networking in the audio industry.
Stage Tec products can be found worldwide in such prominent installations as the Bolshoi Theatre, the Vatican, BMW World in Munich, the BBC in Britain, the Kremlin in Moscow, the Beijing Olympic Stadium, the Berlin Philharmonic, the Eurovision Song Contest 2011 in Germany and in various German, Swiss, Italian and Belgian broadcasters.

www.stagetec.com

"IT'S A ROCK 'N' ROLL SHOW!!"

ROBE IS NON-STOP LIVE WITH VASCO ROSSI

"It's a rock 'n' roll show!!" ... yelled Italian superstar Vasco Rossi repeatedly about a third into his epic set at the Stadio San Nicola in Bari ... although I don't think there was ever any doubt about that as 50,000 adoring fans screamed their appreciation of the showman and provocateur who is arguably Italy's biggest and most successful singer / songwriter ... and rock 'n roll star!

Lighting the Non-Stop Live 2018 stadium tour spectacularly was the artist's long term LD Giovanni Pinna, who included over 300 Robe moving lights on the rig – a mix of MegaPointes, Spiiders and LEDBeam 150s - all supplied as part of the lighting package by Rome based lighting rental company, BOTW, and used to create plenty of excitement and hi-impact.
The starting point for the tour design for Giovanni and the Vasco creative team - was the show-stopping event in Enzo Ferrari Park, Modena last summer, Vasco's one and only live appearance to celebrate 40 years of mainly-thrills-with-a-few-spills in entertainment ... in front of around 250,000 people, the largest rock concert in Italy to date!

The Modena Park design presented a simple, bold, raw industrial looking set and both the artist and his management wanted a continuity from this. As a seasoned performer, Vasco is so charismatic that the enormous but essentially streamlined and Spartan look works brilliantly as a performance backdrop. So this aesthetic was evolved to become the basic look and feel of the 2018 touring show. Lots of video and movement was right at the heart of this with a central screen 18 metres wide by 10 metres high (perfect 16:9 aspect ratio), with two 12 x 12 metre side screens ... all three of which split into two horizontally to give some variation.

Over the stage were four 6 x 4 metre 'satellite' screens cladding the front of four trussing pods which were also rigged with lighting fixtures, and these tracked upstage / downstage and also flew up and down. With these and the splitting big screens, Giovanni was able to transform the stage architecture highly effectively with automation cues. All the screen surfaces were 8 mm semi-transparent, and Giovanni positioned substantial quantities of lighting behind that could blast through, bringing a real 3D quality to the stage.

The set back wall at Modena was made up of scenic panels outlined with LED tape overlaid with a semi-transparent graphic image and the supporting scaffolding skeleton visible for additional depth, and for the tour, a re-scaled version of this was also present. In front of the panels were silver scaffolding pipes and lights were spread out across the whole expanse firing in from the back. A series of trusses were installed over the main stage area, and above the side screens were box truss 'pods' for lighting, which was another detail that was initiated in Modena. The side pods on the tour were each rigged with 50 moving lights.

Marco Bartolini from RM Multimedia (Robe's Italian distributor) on the left with LD Giovanni Pinna

The touring production had a roof which was missing at Modena, so Giovanni seized the additional rigging points to hang front and key lights. As with lighting any stadium show, the key element is that you need LOTS of lights and you have to think seriously HUGE in terms of impact!
With Vasco's show it was important that all the action was full-on from the first to last chords and that the energy could bounce off the stage, enwrap the supercharged audience and pull them into the vibes and emotion of the performance.
As with the Modena show – where Giovanni used over 550 Robe fixtures – he wanted to use just one type of profile or spot ... and this time he chose Robe's new MegaPointe, with 135 of the luminaires scattered all over the rig – above the stage, on the back wall and on the side pods, etc.

For the primary wash light, he picked Robe Spiiders ... and these were also deployed everywhere he could fit a fixture, and used to wash the vast stage space, PA wings and runway out into the audience at the front with light. It was the first time that Giovanni had used MegaPointes fully on a show, and they worked hard in every song of the 2.5 hour set! "I am REALLY pleased with them ... it's an incredible fixture," he declared with a large smile, adding that they have proved totally reliable and endured some atrocious weather. He loves the MegaPointe intensity which has worked well for their stadium show ... and the double prism system, which featured distinctively in the show and also all the many other effects he was able to create with over 100 MegaPointes. He certainly didn't run out of choices!

Spiiders are now one of his go-to fixtures for any show! He had also used around 200 of them in Modena for the main wash and appreciates the Spiider for all the same reasons as the MegaPointes – reliability and high brightness being at the top of the list as well as "their colours, incredible zoom and the very nice tight, definite beam. They are ideal wash and beam lights and generally a great fixture that achieves exactly what we need".
The LEDBeam 150s he admits were a "Great – and very nice - surprise" ... for their size and power.
They were all deployed on the floor on this tour and were extremely noticeable throughout the show, creating great looks in combination with the top rig. "The huge zoom is an excellent feature and it makes them infinitely useful for this sort of close work on the artists. Eight LEDBeam 150s on vertical poles were dedicated just to producing a more edgy style of low level cross and key lighting on the band and risers.
Small and unobtrusive, they are ideal to have in close proximity to performers. Vasco has a very special bond with his fans, so seeing them is essential, and to this end, Giovanni used around 200 blinders, some of which also doubled as strobes. There were also additional beam lights scattered around as practicals and for filling in the back-of-camera shots for the IMAG mix.
A remote follow spotting system controlled around 30 luminaires dotted all over the rig, including front and side key lighting fixtures and both MegaPointes and Spiiders.

Giovanni used a trusty grandMA full size console to run the show, and there was another one for the playback video. The very talented and friendly creative team included video screens / content director and disguise server operator Marco Piva who was stationed at FOH and they worked very closely with live camera director Peppe Romano from Except to create the visual WOW factors needed to fill the stadiums. All have worked together for over 10 years on Vasco and other projects and share a noticeable imaginative synergy. "It's essential to have a good visual fluidity and as we all know one another well, this comes extremely naturally," says Giovanni.

Set designer Claudio Santucci for set builders Gioforma has also been involved in Vasco tours and live shows for some time. PRG provided the screens and the Kinesys automation system which was operated for the show by Jimmy Johnson, with movement also a vital element of the creative picture.
PRG's crew chief was Bart de Cleene and BOTW's was Fabrizio Moggio. "Both have been fantastic," stated Giovanni. Lasers were from ER Productions, designed by Ross Marshall ... and the pyro and flame system was from Parente - the effects – fire and confetti - were also fired from the lighting console. The audio vendor was Agora and the assertive and crystal clear FOH sound was mixed by Andrea Corsellini. Everything was kept in order and running smoothly on the road by production manager Riccardo Genovese.
The biggest challenge on this one was the gruelling schedule – with no days off and a large and complex rig. They were also hammered by erratic weather on a couple of occasions as severe storms and flash flooding battered the Mediterranean and southern Europe!

But of course ... the show went on!

The Backstage Crew

Born and Bred in Grass Valley, CA: AJA Video Systems Celebrates 25 Years

As AJA Video Systems approaches its 25th anniversary, the company is still dedicated to the same guiding principles of developing powerful, engineering-driven products that are built to perform and deliver the highest quality video and audio in any production environment. An engineer by trade, company founder John Abt is still very hands-on in product development, and most recently designed the two 12G-SDI KUMO routers announced at NAB 2018. Abt started AJA Video Systems with his wife Darlene in 1993, to develop simple digital parallel to serial and serial to parallel converters. Many of AJA's products at their core continue to bridge connectivity and simplify pro video workflows through video up, down, cross format conversion.

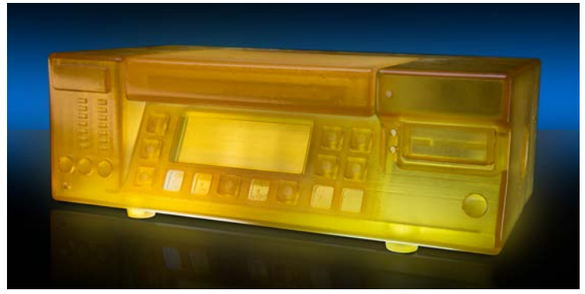
"Now we're getting to a point where people in professional video don't even remember what parallel video was," explained Abt. "The earliest form of digital video was a parallel format that used bulky cables and DB25 connectors. Later Sony introduced SDI, which was a much better way of transporting video but there was still a lot of parallel digital equipment out there, and people needed converters to easily go between those two domains. Our first two products were born out of that need." Abt, an engineer by trade, did all of the mechanical and electrical design of those first two products and in the earliest days, also built them himself.

Prior to founding AJA, Abt spent eight years working at Grass Valley Group (GVG), just as the digital revolution in broadcast was taking off. Before that he worked at Grass Valley-based medical engineering company, Eigen, designing the medical industry version of a digital video framestore. He grew up in Grass Valley and holds BS and MS degrees in Electrical Engineering from California State University Sacramento. Upon graduating from college, he spent eight years working for the Sacramento CBS affiliate, KXTV in master control where he met his wife Darlene, who was also a broadcast engineer at KXTV. When AJA was founded, their son and company namesake, Abe J. Abt, was in grade school and today plays an active role on AJA's inside sales team.

AJA's first product, the C10PS, a parallel to serial converter

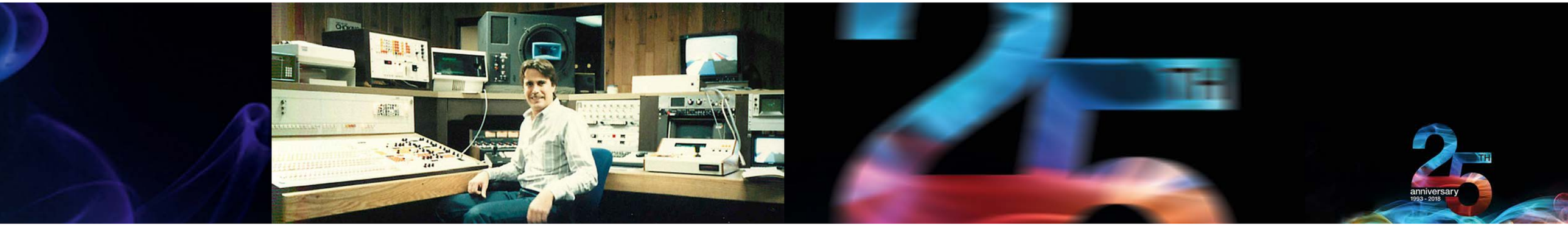
One advantage to being in Grass Valley is access to great engineers, thanks to deep historical roots in engineering innovation. "Not far from AJA's campus, there is a building owned by Litton Engineering that's been there since the 1950s that was an incubator for many of the technology companies in Grass Valley. It's where AJA was based in the early days. US Robotics invented the first 28K and 56K modems in that building, and there was a company there called Cyan that was a consultant for Atari and built some of the earliest videogames. Coincidentally, back in the day, Steve Jobs who was then with Atari, liaised between them and Cyan," continued Abt. "Charlie Litton Senior was a prominent defense contractor who moved to Grass Valley to start Litton Engineering, and lured Dr. Hare, the founder of Grass Valley Group to the area who also worked in the same building and started the video technology legacy that has come out of this area."

Having a career that spans four decades, Abt has experienced several major evolutions in video technology. "Digital was the biggest for sure. Video had been NTSC and PAL analog, which was invented in the early 50s and remained largely the same for 30+ years. Then digital came along and completely transformed everything about the way we work in professional broadcast and film. Then there was the shift from SD to HD and then the more subtle shift from HD to 4K, and now we're seeing a push into HDR, and what potentially promises to be more dramatic, the move to IP-based workflows," said Abt.



Design model for the original Ki Pro

The National Association of Broadcasters Show (NAB) in 1994 marked the arrival of AJA and the launch of its first two products, the C10SP and C10PS. The company had been operating in stealth mode for the previous year and fortunately those debut products generated a lot of excitement. "The first communication we ever put out was an ad in TV Technology that came out in that NAB issue. It helped us spread the word, and we started selling units immediately. We were very bootstrapped in that first year, but made a lot of relationships at our debut NAB that remain to this day.



John Abt at AJA in the early days

Prototypes for early Ki Pro Mini models

AJA's next big breakthrough was the start of its line of Mini-Converters, which remain to be some of the company's highest volume products. AJA's first rack frame cards came out in 1997, and then the first PCI card, a single framestore, was released in 1998. At NAB 2002 the company introduced the first in its line of KONA cards, PCI cards for HD and SD real time video. The next turning point for AJA came in 2003 when a collaboration with Apple led to the debut of the Io; AJA developed the hardware and Apple developed the software. Several successful collaborations with Apple followed including, the Io HD, which was the first product to natively support ProRes in hardware offering desktop power in a mobile video I/O device, the Io XT, AJA's first Thunderbolt device and the Ki Pro, the first affordable HD ProRes digital recorder and player.

While Mini-Converters have been the bread and butter of AJA's business, there are several long lead products backed by years of development that have also hit big. The company pioneered the category of portable digital recorders with the release of the first Ki Pro product in 2009, ushering in a new era of products that recorded edit-ready files, when the conventional path at the time was to record to tape. The FS family of frame synchronizers, often referred to by customers as the 'Swiss army knife' of their digital workflow with a way to solve any possible video bottleneck, have also been very popular and the latest FS-HDR was the first cost effective product to market to support live SDR to HDR, HDR to HDR and HDR to SDR conversion.

"You really have to look into the future when you're building a long lead product. Launching a new line can take two-to-three years of development, and you hope that by the time you hit the market, you've hit the right timing. We know we've hit the right note when we continue building on a family of products, and thankfully have done that with our Ki Pro, KONA, FS, Io, KUMO, Minis and several other lines. You've got to find the right balance of form factor, functionality, feature support, ease of use, price and performance—and sometimes a bit of luck too. Having many years of experience in the business makes this balance and timing easier to predict, but it's never an exact science," remarked Abt.

As AJA grows into new areas, the company continues to deliver pathways for video professionals blazing new workflow trails, from HDR to IP-based standards. Just last year, the company introduced its HDR transforms live converter, the FS-HDR, which provides a fast way to bridge into support for HDR in production, post and delivery. IP also represents a massive change for professional production and post. AJA believes that at some point IP is the way that everyone in the industry will be working because the technology will enable the most cost efficient production and delivery methods, with built-in embedding, disembedding, routing and metadata support. The industry is still working through standardization, but AJA remains actively involved with industry standards organizations like AIMS and recently announced SMPTE ST 2110 support for KONA IP and 10GigE support for 2K/HD video and audio over IP using the Io IP or Avid DNxIP, as well as new IP Mini-Converters for HDMI display at point-of-use.

Mini-Converters are still a high volume part of AJA's business. These small, useful products can be produced to respond immediately to transitions in the market – from the simple legacy Hi5 line, which introduced the possibility of using an inexpensive off-the-shelf consumer monitor for color space-accurate professional video monitoring, to extended cable runs via Fiber in sports and live event broadcast scenarios with the FiDO series, to 12G support and more. These signature products are known for their reliability and AJA support in production environments where down time is not an option.

Documentation for AJA's early products

In addition to its retail products, AJA has a thriving OEM business licensing proprietary technology to many leading third-party gear developers in professional streaming, video, audio and broadcast. For many years the company has also developed custom products for the digital cinema (DCI) industry designing and building components for in-theatre projection. "While it's not something we market in the retail part of our business, our DCI products have pushed us to solve some incredibly complex engineering challenges while adhering to some of the most stringent security certifications in any industry," explained Abt. "These development exercises in problem-solving translate to better engineering and new levels of support across all of our retail products as well."

Abe Abt, the company's namesake, in front of the AJA sign when the company was located in the famed Grass Valley Litton Building

As AJA's customers continue to evolve, the company looks ahead to products that will solve tomorrow's workflows while integrating with existing infrastructure. As customers adapt to working within IP structures, and as the demand for professional quality audio and video for online streaming and mobile devices continues to push upstream from the ProAV market, AJA is devising new products to support top quality content regardless of delivery outcome.

When asked about the business today compared to 25 years ago, Abt mused, "I'm having as much, if not more fun today than I did 25 years ago. We've had incredible partnerships over the years with every major player in content production, and have built a reputation for products that deliver what they promise and then some. The products I'm most excited about right now are the FS4, FS-HDR, Io 4K Plus and Ki Pro Ultra Plus—and another addition coming soon to one of our top product families." Finally, when asked about what he's most proud of, Abt concluded, "I take a lot of pride in supporting our local community and employing 200 of our Grass Valley friends and neighbors."

AJA VIDEO SYSTEMS

MAKING VIDEO PRODUCTION A SIMPLE TASK WITH DATAVIDEO EQUIPMENT

Back in the days, when we were all youngsters, video production was an art. It was an occupation which required highly skilled people and very expensive equipment. Nowadays things go much easier, and after installation the operational part can be done by one or two persons with a minimum of training. Datavideo equipment is designed with these modern standards in mind, so all products are proven easy to install and use with a minimum of training. In the next article we will show three case studies in which Datavideo products made the difference.

HDBASET STUDIO USED IN WATERPOLO VENUE

The acclaimed mobile switcher range is one of the most flexible production switchers around. With a clear user layout and numerous variations the mobile studio range suits any type of production needs. One of the latest installments was done by Studiotech Hungary in the swimming pool of Kaposvári Vizipóló Klub.
Studiotech Hungary's Head of System Engineering, Máté Kovács used the Datavideo HS-1500T in this installation. This mobile switcher uses three HDBaseT inputs so the 1080p signal, camera power and control data are all sent through a single Ethernet wire. The cameras used are Datavideo PTC-150T, a full HD pan/tilt/zoom camera with HDBaseT interface built in. This fast and precise PTZ camera uses a 30x optical zoom lens for clear images and stunning close ups.

Both cameras are built in waterproof housings that are engineered in house and took a month to fabricate. One of the main challenges for this project was finding the right cable to use with the system, and the waterproof connections to the camera. HDBaseT ensures you of cable runs up to 70 meters, so Studiotech provided two cable drums for easy cable storage. Kaposvári Vizipóló Klub is using this solution for recording and showing the underwater part of their match. A Datavideo HDR-1 is used for easy and reliable USB recording. This small recorder captures the signal in 1080p and compresses in h.264 up to 20 megabits. The club is also using a large LCD wall for viewing purposes and to make sure that the output signal of the HS-1500T is compatible a DAC-70 converter is used. The DAC-70 is an ultra-versatile up/down/cross converter that converts SDI into HDMI and vice versa, but also converts VGA and embeds audio onto the output signal.

KMU-100 USED IN DARTS PRODUCTION

Producing darts used to take a variety of cameras, multiple camera operators and a lot of quick decision making and smooth camera operation. Think about it, a camera operator has to know what is going to happen next, is the player aiming at the double 12 or on the double 16? All this happens in a split second and the cameraman has to make a smooth motion to the right number each time. With KMU-100 and two fixed 4K cameras this belongs to the past!

KMU-100 is a signal processor that splits a 4K video signal into multiple 1080P cutouts. Together with an external controller you can create multiple cutouts, or regions of interest, that are sent out to the switcher. This way you can zoom in on the 4K signal without losing much resolution.
KMU-100 can be controlled using the RMC-185 controller, this way you can zoom, pan and tilt on the 4K signal just like you would use a pan/tilt/zoom camera. The real trick is that you can control the KMU-100 through Ethernet as well. This way you can send commands or exact coordinates to the unit which are then sent to one of the SDI outputs.
Robbert van Loon from the Dutch company Keytown has produced his own front end for the KMU-100. In his software called "PresetMaster" is support for a number of Datavideo products, from cameras to switchers, and also the KMU-100. In PresetMaster you can define your own GUI complete with self-placed buttons and elements. This way you can automate pretty much your complete workflow which in the end makes life so much easier.

Robbert has programmed a complete darts board into PresetMaster so he can control and zoom the complete match registration just from his tablet computer: "The KMU-100 is a great addition to this workflow. If we would use regular cameras or even PTZ cameras the action would be much slower. The KMU-100 is more precise than any camera ever, faster than any cameraman ever and it can be operated by a single person."

Visual Radio with Datavideo streaming encoders and PTZ cameras

Datavideo distributor for Poland, WAMM Video Solutions from Kielce created a simple, easy to use visual radio setup using Datavideo hardware. The national radio station, Polish Radio Kielce asked WAMM for a simple, easy to use setup with minimal cables to prevent cable clutter. They also needed a six channel switcher and a reliable streaming solution for high and low bandwidths.

Mr Artur Wiacek from WAMM Video Solutions: "Datavideo is our first choice in hardware solutions for a project like this. Since the customer asked us specifically for a setup with minimal cables we chose for HDBaseT. This enables us to transport camera power, signal in 1080i50, control data and tally information over a single Ethernet cable. Datavideo provided a perfect camera in this range, the PTC-150T. The 30x zoom lens, fast and precise PTZ movement and cost effective price level made this the clear winner for this project."

Polish Radio Kielce uses the Datavideo SE-2200 as their main switcher for visual radio. This switcher is very easy to use and has a straightforward button layout. SE-2200 features six inputs, all SDI and two assignable HDMI inputs. The HDMI inputs have a double feature and can be configured to accept titles coming from a computer running Datavideo titling software. The switcher does the internal split to key/fill signal so you won't lose two input channels.

"This feature is unique amongst the entry level video switching solutions" explains Mr. Johan Lieffers, General Manager at Datavideo Technologies Europe BV. "SE-2200 is the best solution in a project like this. A perfect combination of broadcast grade hardware and professional but easy to use functionality."

Polish Radio Kielce asked for reliable streaming to their website, Youtube account and Facebook crowd. Normally this would ask for a streaming server to transcode and deliver the stream to multiple destinations. But with the Datavideo brand new NVS-40 this can be done from a single unit. NVS-40 encodes up to 4 inputs at the same time, in two bandwidths per stream.

"The whole setup breathes professionality" says Mr. Artur Wiacek from WAMM Video Solutions. "It's great to see such quality result in a setup that is both cost effective and easy to use."

datavideo®

STUDIOtech AUDIOVISUAL ENGINEERING HUNGARY KFT.

wamm video solutions

Elation White Light Quality for World Team Table Tennis Championships 2018

Tylösound AB turns to high light quality of Fuze Wash 575™ for court illumination

Table tennis is serious business. When the 2018 World Team Table Tennis Championships were held April 29 - May 6 in Halmstad, Sweden, the tournament attracted a worldwide viewer audience of 400 million. When a world championship is on the line, all aspects of the production need to be in order, not least illumination of the courts and tables, which must work for TV cameras, a live audience and players alike. Lighting and sound rental company Tylösound AB served as the official technical supplier to the 2018 World Team Table Tennis Championships and used Elation Professional's Fuze Wash 575™ cool-white LED PAR moving head luminaires to meet the strict illumination requirements.

Carefully monitored light levels

Held at Halmstad Arena, with roughly 3000 live spectators each day, the event featured 8 days of live TV and was streamed live. Light levels onto three center courts – and every area of each court – were carefully monitored. "We required a measurement of at least 1600 lux on each 9 x 20 meter court," stated Paul Aladin, owner of Tylösound AB, supplier of lighting, sound, smoke and LED screens for the event." Working with Elation, Aladin initially based his calculations on the use of 48 Fuze Wash 575 fixtures per court. "We found however that we got measurements of 1600-2000 lux using only 32 fixtures per court so we were able to use fewer fixtures than originally planned. It worked very well."

High quality light

Thirty-two Fuze Wash 575 fixtures were rigged above each of three table tennis courts at a trim height of 12 to13 meters – 96 fixtures total with 8 held as spares. A very smooth, uniform light quality was essential, something the Fuze Wash 575 excels at with an extremely accurate color temperature and high CRI of 95. "We measured the CRI all over the court at

95," says Aladin. "It was very consistent and measured even everywhere, which was amazing." Tylösound had tested the Fuze fixture a month prior to the World Championships at a European qualification tournament, also held in Halmstad, and found it produced the high quality of light they needed.

Prior to the first matches at the World Championships, players were consulted about the light quality and the response was positive. Aladin says that only small adjustments were made in directional positioning after the first few matches were played until all were satisfied, a positioning change easily done with the moving head luminaire. The Fuze Wash 575 was also tested for use with the super slow-motion cameras used on the event and the result was extremely good, according to Aladin. "I can tell you that even the Japanese and Chinese staff were very impressed with the lighting!" he said.

The Fuze fixture was used for more than court lighting however. The daylight white moving heads worked with color-changing moving heads during player introductions and music breaks, as well as a pre-event ceremony. On the tournament's last day, while center court was lit for the finals match, special seating was brought in on the other two courts and spotlighted using the Fuze fixtures.

The Fuze Wash 575 houses a high-output 350W cool-white COB LED engine with motorized beam control, which Aladin employed when illuminating logos on the floor. The fixture has proven a popular choice when especially high demands are placed on the lighting and its lower wattage, lower weight and lower maintenance compared to conventional 575W discharge daylight PAR lights are added benefits of the LED solution. "Initially, some people thought it was too small and that LED would not be good enough for this project but it was a big success," Aladin concludes. "I don't know what else the light could have. It's an excellent fixture." The Fuze was suggested to Tylösound by Swedish lighting company Bellalite, who Aladin says they received excellent support from on the project.

About Elation Professional

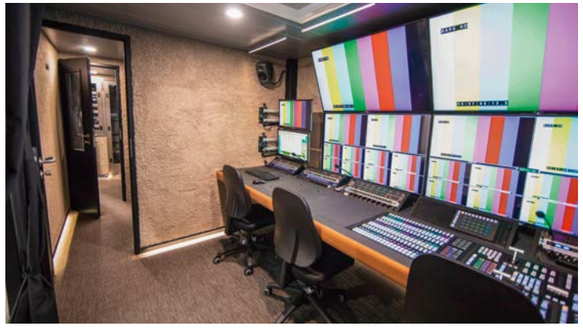
Elation Professional is one of the world's leading lighting and visual solutions providers and is the global brand of Elation Lighting. Founded in 1992 and headquartered in Los Angeles, with European sales, distribution and support based in The Netherlands, Elation designs and manufactures a comprehensive range of innovative yet affordable lighting and video products that are distributed through a global network of dealers and distributors. Made up of a spirited team of dedicated personnel, Elation is setting new efficiency and performance standards in Platinum lamp and LED technology and is acknowledged for a comprehensive commitment to Total Support. As a company in expansion with a presence in a growing variety of market segments, chances are you've experienced Elation lighting at a concert, special event, TV, theater, late night venue, House of Worship, theme park, cruise ship, exhibition, architectural space or elsewhere. For more information, please visit www.elationlighting.com

ELATION PROFESSIONAL

LIEBHERR WORLD TABLE TENNIS CHAMPIONSHIPS 2018 HALMSTAD · 29 APRIL – 6 MAY

IHSE KVM SWITCH FEATURES ON NEP BELGIUM'S NEW UHD OB VAN

DRACO TERA KVM MATRIX PROVIDES CONNECTIVITY AND SWITCHING TO OPERATORS ON NEP BELGIUM'S NEWEST OB VAN



NEP Belgium recently increased its extensive fleet of outside broadcast vehicles with the addition of a new 10-metre OB van that is fully equipped to work in HD and UHD format and can handle productions with up to 8 HD or 8 UHD cameras.

This unit is based on Broadcast Solutions' Streamline family of highly-specified and popular OB vans; a proven design concept that incorporates the essence of more than 15 years' experience in building outside broadcast vehicles. So far over 40 OB vans have been built that combine future proof technology, short delivery times to deliver maximum flexibility in daily use with significant cost savings. Starting with the core Streamline S8L configuration, NEP Belgium selected a 10-operator configuration with separate working rooms for each of the production, audio and engineering functions.
Whilst based on a standard structure, each build is fully customisable to suit the intended application and usage: a characteristic that NEP Belgium took advantage of in defining and specifying Unit 18.

Designed for the role

For basic production tools, Unit 18 includes a field-proven mix of reliable technology by major global brands. The vehicle is equipped with a SONY XVS6000 vision mixer, Imagine SX Pro video matrix and multiviewer, IHSE KVM and Riedel Artist intercom. A Lawo mc²36 fader console with integrated router, in-built DSP and I/O meets the requirement for 5.1 Surround productions and workflows, supported by Genelec 5.1 monitoring.
It also incorporates bespoke changes that massively extend the van's capabilities. Specific to this build is the implementation of a Lawo V matrix software-defined IP-routing and processing core to handle signal processing, embedding/de-embedding and colour correction. The system supports 2022-6/7 video streams and Ravenna/AES67 audio streams, with MADI to audio-over-IP bridging providing seamless integration of network audio with the existing infrastructure of EVS servers and other devices

The essential role of KVM in Unit 18

In the cramped and pressurised environment of an OB van during a live production, it is essential that all operators have immediate, uninterrupted and accurate access to essential production tools; whatever their function; wherever they are located and whenever needed. This outside broadcast vehicle, like all others, is designed to offer the highest level of comfort, convenience and efficiency. That means that noisy, heat-generating and space-consuming hardware is located in equipment bays, located away for operators as far as possible.

An IHSE Draco tera KVM switching matrix is used to enable instant connection and switching of broadcast equipment by operators at their workstations. The KVM switch provides unrestricted and un-hindered access to all these broadcast devices. To the operator, it is as though all equipment is local to them: they can operate whichever device they need and switch to others with the press of a button, or simple keyboard command.

Integrated control

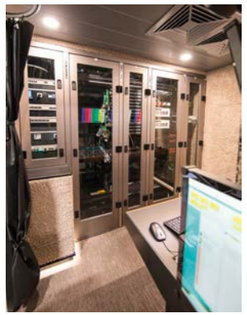
In charge of control in Unit 18 is a VSM-System. This powerful and flexible system overlooks the video switcher, multiviewer as well as audio-routing and handling of IP-streams. It is fully configured to operate in conjunction with the Draco tera switch by means of the tera API; again a feature and combination of products that is used widely across the broadcast industry. Programming of the Lawo VSM to operate in the desired manner was undertaken through a joint process. "We worked out how we would like to operate the complete solution and the actual programming was undertaken by Lawo and Broadcast Solutions," said Geert Thoelen, project manager at NEP Belgium. "It was an iterative process with all three teams working well together to give us the best final solution."

Futureproofing

With all talk at the moment about future broadcast operations moving toward more extensive IP-based workflows, it was essential that this vehicle be equipped with technology that is sufficiently flexible to operate and integrate into all future operational broadcast workflows.
IHSE KVM switching solutions are an essential part of the existing broad-

SPECIFICATIONS

Size	10 m long, 2.5 m wide, 17 tonnes
Personnel	10 operators
Cameras	8 x Sony HDC-4300 or 8 x Grass Valley LDX-86
Vision switcher	Sony XVS 6000
Video router	Imagine Communications Platinum SX Pro 128 x 128
Slomo devices	2 x EVS XT3, 12 channels
Control	Lawo VSM
Time generator	Evertz
Video measurement	Leader LV5333, Phabrix
Audio mixer	Lawo mc236 with 40 faders
Audio Converter	DirectOut Montone 42
Audio Monitoring	Genelec 5.1
Audio Effects	TC Electronic TC-M6000
Audio Measurement	RTW-TM9
Intercom	Riedel Artist 64
Wireless Talk-Back	Riedel RiFace / Motorola
Embed-de-embed, processing	Lawo V__matrix 5, 2 x C100 cards
Video Stageboxes	2x Lawo V__link, A__mic, via 10GBit fibre
Audio Stageboxes	1x Lawo Compact I/O
Video networking	Arista Switch 7280SR, 40 Gb
IP networking	Cisco SG300



cast infrastructure within this OB van: giving each operator instant access to every computer and tool onboard. As more IP-connected technology is implemented into the broadcast chain, there will be a need to access and manage virtual machines over an IP network. Ideally this process will be incorporated into the current setup, so that users remain unaware of the physical location of the actual device and whether they are working on a real or virtual machine.
Provision for this capability is already in place and will be integrated when required. The new Remote IP CPU from IHSE enables network-connected virtual machines to be accessed alongside other real machines already connected to a Draco tera KVM switch. Communication is via RDP (Remote Desktop Protocol). In addition to RDP access of remote and virtual machines, secure shell sessions (SSH) can also be operated from the workstation to enable device management and network control.

A complete solution

In the ever-changing business of live production, interconnectivity and scalability is pivotal to the success of a broadcaster or production company. This type of OB van incorporates sophisticated solutions for network connectivity, real-time networks, decentralized router capabilities, remote production, signal distribution and processing. These technologies are an ideal base from which to move towards fully-IP-based networking infrastructures in the future.

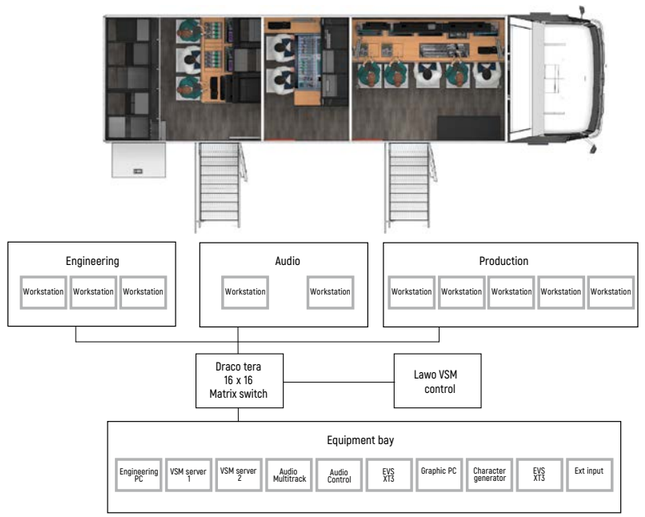
The final result

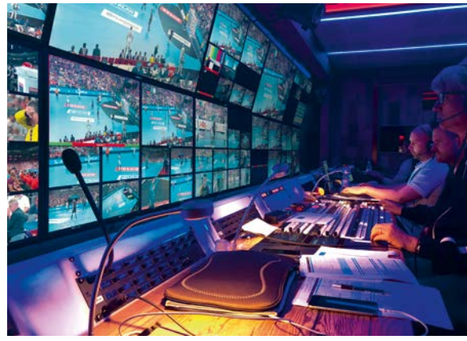
The NEP production teams are extremely happy with the delivered unit. Geert Thoelen: "Unit 18 was destined to be a multi-purpose vehicle capable of taking on a wide range of production projects throughout Europe. Already it has been used for the Royal Wedding in the UK and locally here in Belgium to cover first class pro-league football. Our fleet is known to be amongst the most flexible in Europe and this van certainly lives up to that standard. The final result is exactly what we need."

QUOTATIONS

"With new room concepts and support for operator positions in separate work areas, together with its additional interconnectivity technology, Unit 18 offers more flexibility during HD and UHD productions and will adapt to future IP-based workflows. Broadcast Solutions once again proves its Streamline OB Van Family concept to be ideal for today's broadcast operations and adaptable to future workflows and technologies in the IP-world," said Rainer Kampe, CTO of Broadcast Solutions. "The IHSE KVM system forms an essential element of that solution, providing connectivity and flexibility needed as these vans take on a variety of production roles of all types."

"IHSE KVM switches are used throughout the broadcast industry and have gained a reputation for their ability to deliver performance, reliability and efficiency in every application," said Manuel Greisinger, head of sales at IHSE. "The flexibility offered by the Draco tera KVM system allows it to adapt and meet every installation requirement; whatever the environment or challenge; today and in the future."





VELUX EHF FINAL4 2018 – THE TOP CLASS OF HANDBALL

THE FIRST UHD LIVE BROADCAST OF AN EHF HANDBALL GAME ACCORDING TO A PRODUCTION CONCEPT OF EHF AND TV SKYLINE.

During the last weekend in May 2018, the handball world turned its attention to Cologne, Germany. The LANXESS Arena in the heart of the cathedral city was the venue for the coveted title of the VELUX EHF Champions League with the last four games, the FINAL4, on May 26 and 27. This was the ninth time that the battle for the top handball trophy took place in Cologne's LANXESS Arena. On both days, 19,403 enthusiastic spectators filled the event arena during the most important club handball event of the year.

VELUX EHF FINAL4 2018

The VELUX EHF FINAL4 is without question an international sports event of superlatives. Each year, fans from all over the world travel to Cologne to support the four best teams in Europe in the fight for the Champions League title and to celebrate this exciting highlight of European club handball.

The European Handball Federation (EHF) is the umbrella organisation for handball in Europe with 52 national member associations. At the same time, it is one of five continental federations of the International Handball Federation.

The VELUX EHF Champignons League is the highest European Cup competition for handball club teams. The four best teams out of a total of 28 participants will qualify for the FINAL4.
Until 2009, the semi-finals and the final were played in the first and second leg. This changed in the season of 2009/2010; the semi-finals and the final have since been played out in a knockout system as part of the FINAL4 in Cologne.

THIS YEAR'S FINAL4 OPPONENTS WERE:
Paris St. Germain,
Montpellier HB,
HBC Nantes
and RK Vardar (Skopje)

While the semi-finals took place on Saturday (May 26), the match for third place and the final were played out on Sunday (27 May).

Paris St. Germain and RK Vardar Skopje were favourites before the tournament started, however last year's finalists stumbled. In the end, it was HBC Nantes and Montpellier HB who fought for the top class title.
This tournament was a big surprise for HBC Nantes, with the club prevailing over top favourite Paris St. Germain in the first semi-final. In the other semi-final, Montpellier narrowly beat RK Vardar Skopje. It was a similarly tight call in the small final for third place, with Paris St. Germain celebrating a close win over RK Vardar Skopje.
In the final, Montpellier HB won 32-27 against Nantes in a surprisingly pure French final. This puts Montpellier back at the top of the podium for the first time after 15 years.

TV BROADCASTING – INNOVATIVE TECHNOLOGY FOR THE BEST ON-SCREEN EXPERIENCE

The TV broadcast of the FINAL4 2018 sets a milestone in television broadcasting. The top handball Champions League was not shown on free TV.
In Germany, pay TV provider Sky broadcasted the semi-finals, the match for third place as well as the final live and exclusively. All games could also be found on Sky Go's live stream.

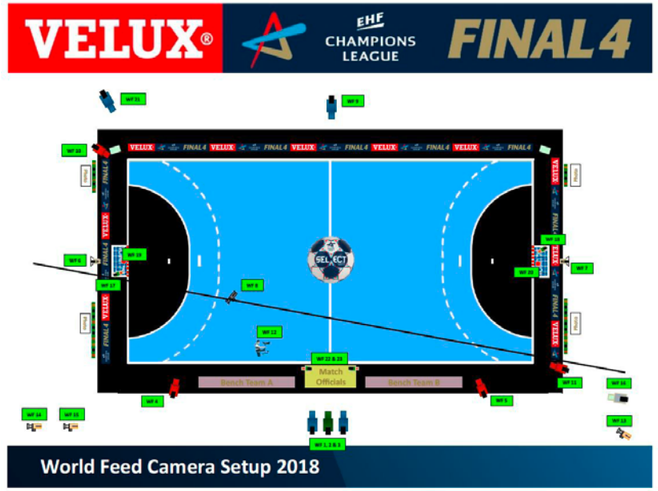
Outside of Germany, 41 other television stations broadcasted the signal to a total of 80 different countries. Viewers without a TV broadcast were able to follow the events in the LANXESS Arena via live stream on ehfTV.com.
As host broadcaster, EHF commissioned TV Skyline GmbH based in Mainz, Germany, with the technical implementation of the first ever live UHD transmission of an EHF handball game.

The TV Skyline Team was on site with 55 employees to implement the live broadcast's tight schedule. All equipment was set up on Friday, May 25, 2018, with the samples and a UHD test taking place on the same day.
On Saturday, May 26, 2018, HBC Nantes played Paris Saint-Germain at 3:15 pm, while the second game of HC Vardar Skopje against Montpellier HB took place at 6 pm. The following day began with a press conference at 1:30 pm, followed by the match for third place with Paris Saint-Germain against HC Vardar Skopje at 2:45 pm. At 6 pm, it was then time for the grand finale: HBC Nantes vs. Montpellier HB.

To realize the simultaneous TV production in UHD and HD 1080p50 (3G), TV SKYLINE's OB8 UHD was used as a control room. A total of 26 cameras followed the games as well as the off-field spectacle, bringing the spectator right into the middle of all action.

THE EQUIPMENT

7x	Grass Valley LDX 86N UHD cameras on tripods or portable: KA 1, KA 3, KA 4, KA 5, KA 9, KA 19, KA 24
3x	Grass Valley 3G camera systems on tripods or portable: KA 14, KA 15, KA 16
5x	3G super slomo in 3G 3-fold (1080p 150): KA 2, KA 6, KA 7, KA 10, KA 11
1x	Grass Valley LDX 80 3G steadicams with COBHAM RF system: KA 12
2x	In-goal 3G cameras (InGoal Set from TV Skyline)
2x	Benchcam HD 1200
6x	EVS XT3 HD
4x	XAVC 300 UHD recording

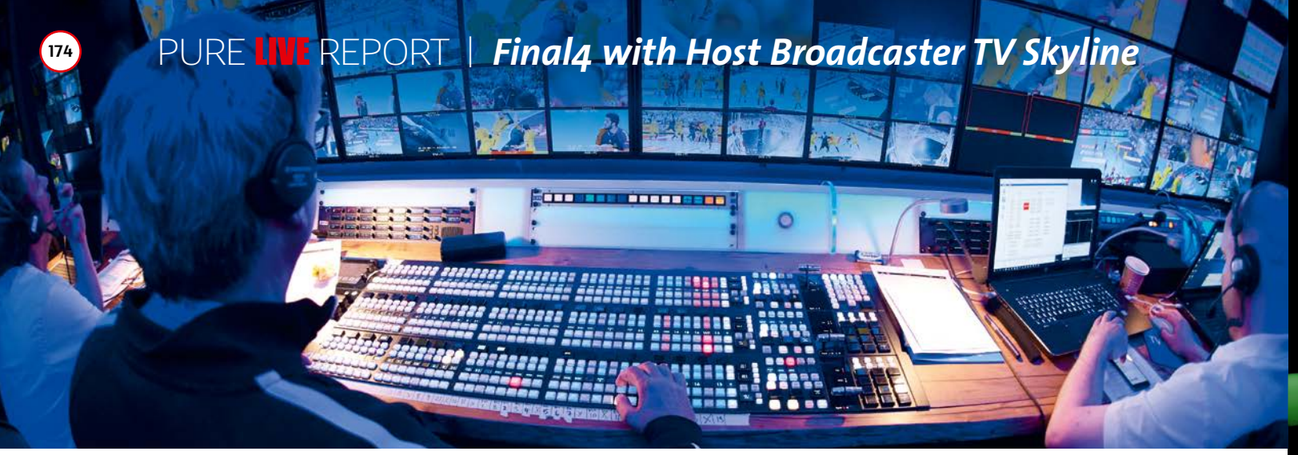


World Feed Camera Setup 2018

High-conversion was realised using a Grass Valley Kahuna 9600 production switcher format Fusion3 and EVS.

The sound was transmitted in Dolby 5.1.

The TV graphics were produced in parallel in 3G and UHD by TV Graphics (Denmark).



NEW BALL TRACKING TECHNOLOGY IBALL

The FINAL4 production also saw another technological premiere in handball: EHF, SELECT and KINEXON presented the iBall and ball tracking technology. With this new technology, information regarding ball speed, shot detection, shot position and ball position in the goal is captured, allowing viewers to directly follow ball speed and distance to the goal. In addition, all captured information – including shot distribution by team and player, the exact position of every on-target shot as well as overall shot behaviour by team – is made available to TV and digital channels in real time.

The KINEXON chip is placed inside the ball on the bladder and is thus protected from external influences such as dents and hits during the game. A special foam on the outside ensures the best grip. The SELECT / KINEXON iBall and the associated new insights into the game make the performance of each player more tangible and thus ensure even greater fan proximity.
Managing Director of EHF Marketing GmbH, David Szlezak, said: "The iBall is an important step into the digital future of European handball. The data we are collecting allows us and our media partners to better explain the fast and dynamic sport of handball and provides a new dimension to storytelling around sport. We are delighted to present this world premiere on the highest possible level of club handball and are convinced that fans and media partners will love this new level of sports data."

A COMPLETE SUCCESS

VELUX EHF FINAL4's innovative 4K production was a complete success, marking a new milestone for EHF Marketing on their way to bringing the best quality possible to viewers at home.
"As we mentioned before the event, there is no doubt from our side that 4K has come to stay with us," says Miguel Mateo, Head of TV & Media at EHF Marketing. "We want to thank our host broadcasting partner, TV Skyline, for our great cooperation in this pioneer project, and also our TV partners who trusted us during this very first 4K production."

RECORD TV AUDIENCES IN FRANCE

The VELUX EHF FINAL4 2018 has had a huge impact in France, where the EHF Marketing TV partner, beIN Sports, reached an all-time record audience for a club handball match during the final. This final match was also broadcast free-to-air on TFX, giving even bigger coverage to the event. Also in other markets the event attracted a huge interest, like in Hungary, Germany – where the final was the most watched sports event on Sunday – and especially Argentina, where the performance of MVP Diego Simonet during the weekend was a perfect showcase for the VELUX EHF Champions League and for handball in general.

FIT FOR 4K

DRAKA COAXIAL CABLE FOR TRANSMISSION OF 4K SIGNALS

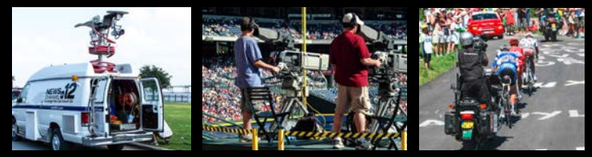
The infrastructure of broadcasters is currently designed for 1080i, 720p and 1080p video signals. However, as the market continues to develop, 4K is becoming increasingly important. This also has an impact on the broadcast industry. Draka offers UHD series coaxial cables for this purpose.
HD-SDI is the current interface for serial transmission of uncompressed video data in the broadcast industry. The two most common standards are 1080i (1920 x 1080 pixels) and 720p (1280 x 720 pixels). According to the SMPTE 292M standard, the transmission rate is 1.5 Gbit/s. The newer 1080p HD-SDI signal with a resolution of 1920 x 1080 pixels transmits data at 3 Gbit/s in accordance with the SMPTE 424M standard. According to both standards, the maximum cable length must not exceed an attenuation of 20 dB at half clock frequency.

Coaxial cable goes 4K
There is currently a discussion on higher data rate on the market. 4K is playing an ever-increasing role in this. Currently, 4K transmissions in Quad Link (4 x 3 Gbit/s) are carried out for technical reasons. In practice, however, this proves to be uneconomical. Single-link transmission at 12 Gbit/s should be aimed for.

According to SMPTE ST 2082, the 4K format transmits video signals with a resolution of 3840 x 2160 pixels. Data transmission takes place with a rate of 12 Gbit/s. This corresponds to a half clock frequency of 6 GHz. The standard also provides for a maximum allowed attenuation of 40 dB. Draka has developed coaxial cables for 4K applications based on these specifications. For example, the new UHD series includes the UHD50 and UHD100. In developing the new series, Draka has placed great emphasis on meeting the requirements of OB truck manufacturers, such as maintaining the outer cable diameters of 4.5 and 7 millimeters. Draka has achieved this through higher dielectric foaming and a silver-plated, size-optimized, inner conductor.
The quality of the components is of decisive importance in the technical implementation. To achieve maximum results, connectors and cables should be matched to each other. Tolerances must be kept as low as possible.

It should also be taken into account that different generations of equalizers are installed in the input board of the devices. These have a significant influence in determining the maximum achievable cable length.

Author: Gabriele Del Brenna



A brand of the Prysmian Group

SOUTHFIELDS CREATES COUNTRY-WIDE SPORTS PRODUCTION WITH TRICASTER®

When one in four of your nation's citizens actively plays the world's most popular sport, and in another sport your national women's team is the most successful team in World Cup history, chances are you have a lot of fans eager to watch competitions.

This is true for the Netherlands, a small country that's home to 17 million people, more than 4.5 million of whom are registered soccer players at its 35,000 sports clubs. That's a quarter of the country's population. But football is just part of the story. According to Olympics coverage during the Rio games, hockey's popularity in the Netherlands is booming too, with around 253,000 men and women playing club hockey there, or one in 67 residents. Playing these sports is one thing; watching them is another. Both football and hockey are wildly popular among Dutch spectators.

And their popularity just keeps growing, especially as 2nd division (Tweede Divisie) football and premiere league (Hoofdklasse) hockey develop internationally and gain more exposure through television coverage.

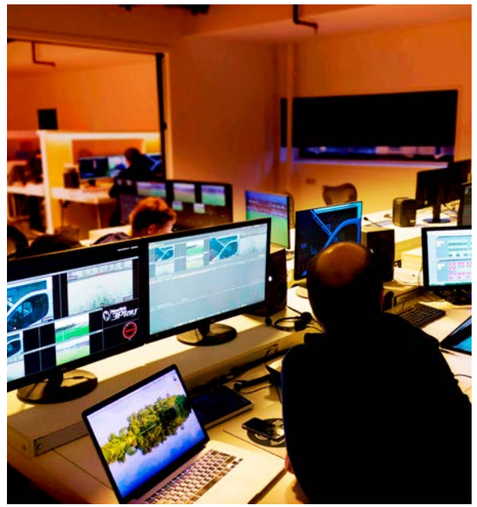
The trick is to broadcast enough matches for fans on game days, from any of the venues scattered across the Netherlands. And that's what Southfields set out to do.

Growth of a Fan Base

Southfields is a Holland-based television producer that specialises in sports productions. The company regularly provides OB (outside broadcast) coverage of large football and hockey competitions for major Dutch broadcasters Fox Sports and Ziggo Sport—including in-house production for nearly 85% of the latter's programming. Its sports production further extends to Champions League and exhibition games (called friendly matches) of the national football team, produced for Ziggo as well as for the SBS-owned Veronica TV.

One in 61 residents of Holland play field hockey, creating demand for live coverage

NEP LiveCenter in Hilversum, central to all regions of the Netherlands.



Instead of multiple OB vans or studios, all game footage is processed at an NEP facility in Hilversum.

But Southfields's reach has expanded beyond live game production, growing into broadcast rights as well. The company has exclusive production and exploitation rights in Holland for second division football and for primary league men's and women's hockey.

Ten years ago, the Euro Hockey League (EHL, the equivalent of the football Champions League—of which Southfields is 33% owner) formed. The EHL had pioneered new competition rules that made games far more exciting and spectator-friendly. Its new rules were adopted as regulation for the Olympic Games and all major tournaments.

"It was really important that we show all the matches, not just the championship teams," comments Maarten Verstraete, Southfields' manager of technical projects and sports management. "Each game is just as important for the lower teams as it is for the leading clubs. That is what makes a competition a competition."

It also translates into an exceptionally large amount of coverage, since Southfields was committed to distributing not only the prominent matches throughout the season, but all matches played in a given weekend.

That could mean 9 football matches in one day, and 12 hockey matches in one day—with multiple start times and many games to cover at once.

More Matches, More Content

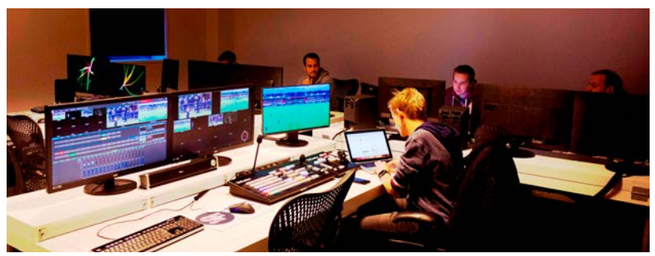
What's more, broadcasters wanted the content just as much as the fans did. Arnout van der Hoek, workflow consultant with NewTek elite reseller Lines Broadcast BV in the Netherlands, says, "Sports has grown so enormously in Holland, that the broadcasters needed more matches. Southfields covered championships, they covered all the big games – and the broadcasters still wanted more content, more league matches." Holding the rights to EHL, Hoofdklasse Hockey and Tweede Divisie games would give Southfields the ability to provide them. But adding hundreds of games in a single season would be incredibly expensive (if not impossible) with the traditional OB production truck model. Southfields' Verstraete says, "When you have this quantity of matches to produce, if you have matches at one o'clock and three o'clock, then at six and nine o'clock, you cannot just say, 'Okay, give me 23 OB vans, let them cross all over the Netherlands.'"

"At that point," he says, "we needed to develop a new system to get the distribution quickly from the pitch to the viewer."

A Cross-Country Workflow

Most production companies take their workflow to the stadium. But Southfields figured they should bring the stadiums into their workflow. First, Verstraete and his colleagues looked at the resources they had available.

"The Netherlands has a nice infrastructure with glass fibre," says Verstraete. "That's a really positive side of the Netherlands. It's small but really has a great infrastructure."



Camera feeds from multiple stadiums are sent via fibre for centralized production.

Cameras at the fields capture matches as well as sideline interviews.

That meant that wherever they produced coverage, they'd be able to connect it easily over a distance. So, they contracted with a company to perform line control of every stadium they worked with in 2nd division and Hoofdklasse Hockey, ensuring 24/7 service.

Then they looked at production locations. The municipality of Hilversum, reasonably central to all the regions in the Netherlands (and widely known as the "media city" because of its numerous broadcasters and studios), was already very well interconnected with high speed data from throughout the country. Hilversum is also home to NEP The Netherlands, a centralized facility for editing, playout and storage, with global dark fibre connectivity that can carry vastly more data at higher speeds than Ethernet.

Most importantly, says Verstraete, "NEP has the LiveCenter where we can easily patch our signals through, and link it from the stadiums directly to our multisport room."

In one central location, Southfields had found a single, network-based replacement for 23 physical OB vans. Best of all, they could outfit the facility affordably – with only four TriCasters®.

Playing Sports All Over The Network

"We were interested in all-in-one production systems such as TriCaster, because with sports, there are some capabilities that are absolutely necessary," says Verstraete. "We knew what it would take to produce these games."

In other words, in sports, it isn't just about switching cameras. The content Southfields produces demanded constant access to graphics capabilities, slow-motion replays, and audio—coming in not only from the field, but also from play-by-play commentary delivered in the production centre—as well as recordings of camera feeds from every match taking place. Verstraete developed a plan to capture all of these various feeds (from each of 14 venues that may have games that day), no matter which matches would be broadcast on the sports channels or which would be packaged for highlights.

Camera operators would go to every game as usual, only instead of cabling their cameras back to a truck they'd connect via SDI into Southfield's encoders to carry it into the data network. rom the moment of the opening whistle, from every match simultaneously, the game footage would be encoded and transmitted to the LiveCenter over fibre.

From The Pitch To The Viewer

Imagine having the entire country's sports coverage pulled into one matrix and making it available to everyone producing a game. That's how Southfields assigns camera feeds and sources to their TriCasters.

"Once the feeds are in the LiveCenter we can say, 'Okay, use these camera sources for TriCaster number one, those camera sources for TriCaster number two. Then send these others directly to edit'" when it's a match that will be edited for highlights, says Verstraete. "We can divide sources on the fly, per match, wherever we need them to be produced."

Using their TriCaster systems became even easier with the use of NDI®, NewTek's technology for video over IP, he says. "What we liked was that we can share everything, all the sources we have, in any machine that's on the network." With NDI, and their 10Gb network connectivity allows them to have one program produced in a certain machine, while another system on the network can pull in the first match's sources and use them in a second production. Or, says Verstraete, "it can be available to anyone on the network, so if somebody has to narrate the highlights later on, he can already watch the match on his laptop." He says NDI made a big difference in choosing TriCaster.

"Sooner or later, as more manufacturers support it, all the parts in the workflow will be compatible with NDI. Then at a certain point, we can just get all our footage from the pitch, to our production room over NDI. Then I won't need SDI anymore."

Test and Repeat

To make this innovative production process work, their systems had to achieve the same visual quality as they could produce in one of their typical OB programs. So, they put TriCaster through its paces. According to Verstraete, "The things we were looking for were factors like the video encoding of the TriCaster, whether it would be suitable for what we needed. Would the recordings be usable, and if so, in what ways could we use them? What's the program output of the whole system going to look like? How does it compare to a high-end unit?"

A commentator watches a match to prepare highlights narration

They tested the concept at a championship tennis match, and then did a test with an EHL game. They transmitted over satellite for broadcast, but simultaneously sent a second signal through their remote production encoders into the TriCaster back at the LiveCenter, and compared them.

The side-by-side comparison involved a long process of configuring, testing, modifying, and testing again. They focused on evaluating the actual quality of pictures—how it would look to a viewer—as opposed to merely confirming that the signal was successfully encoded in H.264 or H.265.

"We were in a building that was being rebuilt and it was still not ready yet, and there was this TriCaster in front of us and everybody watching behind us," says Verstraete. "At a certain moment, it was time to test—and then it was the moment of truth. 'It worked, it worked!' It was really goosebumps all over the place."

TriCaster achieved the production quality they required in the workflow they designed, and now Southfields uses four of them to provide production to the dozens of matches that take place every week, enabling fans to get closer to the teams playing the sports they love – even if they're not the championship team.

"The nice thing about the production environment we operate now," says Verstraete, "is that by bringing more games to the viewers, we can get the lower levels of competition to be as heavily involved with TV coverage as the higher ones, and that's very exciting to everyone."

And that, Southfield knows, is what it takes to make sports.

Footage captured centrally can be brought into edit suites for highlights editing.

AUSTRIAN PRODUCTION SPECIALIST MEDIAHAUS ENJOYS A REPUTATION FOR PRODUCING HIGH QUALITY CONTENT ON BEHALF OF LOCAL AND INTERNATIONAL CORPORATE AND MEDIA CLIENTS SUCH AS FC RED BULL SALZBURG AND NEWSPAPER SALZBURGER NACHRICHTEN.

MEDIAHAUS BRINGS THE POWER OF BROADCAST TO LIVE

Over the last decade it has seen its core workflow evolve from a small, portable, flyaway system into a fully-fledged, sophisticated OB with infrastructure products from Blackmagic Design for acquisition, switching, distribution and monitoring at its very core. Wolfgang Angermüller, Mediahaus' CEO explains that the team's flexibility is its key strength. "For us, production services don't stop at 5pm on a Friday: our international television and event partners value the fact that they can call on us for any project, no matter how unconventional or demanding."

More recently Mediahaus has added the URSA Broadcast camera to its inventory to sit alongside the URSA Mini Pro. The URSA Broadcast has a native B4 mount, which allows the team to not only deploy low cost HD and Ultra HD ENG lenses, but also the ability to add B4 box lenses when a more traditional broadcast configuration is required by clients, for example, at corporate events that require a broadcast quality feed.

Mediahaus acquired multiple URSA Broadcast camera chains and immediately set them to use across a varied range of events, including the inaugural European Snow Volleyball Championships and the annual Leonadis Sport Gala, one of Austria's most prestigious sports awards.
For Mediahaus' founder and CEO Wolfgang Angermüller, introducing the URSA Broadcast to his company's OB set-up couldn't come soon enough. "As a camera it is so flexible it can be used for studio and live sports or for corporate event production; almost like two cameras in one," says Angermüller. "It is destined to be the new industry workhorse. We couldn't wait to just plug it in and go, since everything you need for a live transmission is carried in one box over one cable."

The team pairs the URSA Broadcast units with Blackmagic Camera Fiber Converters, delivering power, tally, talkback and camera signal all through one SMPTE cable. "We've been impressed by the stability of the URSA Broadcast fiber solution," Wolfgang continues. "The camera's redundant design means that you can operate from a number of different set ups, and the SMPTE connection is incredibly robust compared to the more fragile solutions we previously worked with. This means our operators can have complete confidence in the camera set up, no matter what location or conditions we're working in."

For comms during live events, Mediahaus utilizes an intercom setting with an Altair WBS-200 base station, where the PGM sound is mixed to the intercom feed, together with additional wireless belt packs for floor manager, wireless camera operators and so on. From there the Altair 4W2-200 Universal 4wire-2wire interface goes through into the front mic XLR and phones out of the Blackmagic Design ATEM Talkback Converter.

With a crew versed in regular live sports productions, capturing wide depth of field and pulling focus with B4-mount lenses presents no problem. "We control the iris of the URSA Broadcast camera chains with a shader in the OB van via ATEM software control," continues Wolfgang. "Giving the camera operators just one PGM (Program) return feed meant they could focus on framing, zoom and sharpness. It's a similar workflow to one which is used on most large OB trucks but for a significantly lower cost."

https://www.mediahaus.tv/

Mountaintop OB

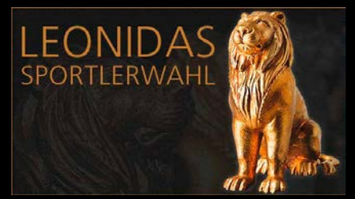
The inaugural finals for the European Snow Volleyball Championship were staged at the top of an Austrian ski resort, in a specially constructed snow stadium. With international broadcasters wanting to cover the event, Mediahaus was responsible for delivering high quality live broadcast, streaming and big screen video feeds.

Once at the top of the mountain, the team built a OB solution in a heated tent next to the arena. The URSA Broadcasts, one with an ultra wide B4 Fujinon lens, were the main on-court cameras, with a Micro Studio Camera 4K positioned high in the arena for beauty shots.

The cameras were also equipped with URSA Studio Viewfinders, helping to handle very harsh sun conditions. "The operators were able to use peaking contrast and brightness adjustment to ensure they could keep pictures sharp, even with the sun beating down on them."

18 television stations, including several with extremely high technical requirements, took the HD 1080i50 broadcast feed, demonstrating the quality of the compact and flexible OB system. "With 34 volleyball matches in three days, with temperatures between -15 and 5 degrees, we really took the workflow to the limit. But all of it from the cameras, to the converters, to the mixer and router were all incredibly reliable."

http://www.snowvolleyball.at/



The camera set-up was backed up by Mediahaus' creative hub; a live PPU (Portable Production Unit) that includes an ATEM 2 M/E Production Studio 4K switcher, an accompanying ATEM 2 M/E Broadcast Panel and an ATEM Talkback Converter.

"In previous years we've had the challenge of matching different camera models without being able to control them all live via the ATEM mixer," explains Angermüller. "This year, with all positions covered with Blackmagic cameras, our production had the same fantastic broadcast quality, which was all together much more harmonious. Using the URSA Broadcast's extended video mode, we could match the pictures with the URSA Minis very easily and without any other color adjustment to achieve a perfect TV look in seconds."

https://www.leadersnet.at/eventkalender/11968,leonidas-sportgala-2018.html

Capturing Austria's biggest sporting stars

The Leonadis Sport Gala honours Salzbug's athletes, coaches and teams. The 2018 awards ceremony was streamed live to YouTube and Facebook with a separate highlights program broadcast by national broadcaster ORF.

Mediahaus has covered the event since 2011, upping the production values each time as the event grows in stature. The URSA Broadcast acquisition meant that the team could deliver a glamorous and modern look to the whole enterprise and also deploy box broadcast lenses for the first time.

Two URSA Broadcast units acted as A cameras, positioned at the back of the venue and paired with paired with a Canon DIGISUPER 72 Field Lens to obtain good quality close-ups of the hosts, awards winners and all the action on stage. The units were complemented by a shoulder mounted URSA Mini Pro and a pair of Blackmagic Micro Studio Camera 4K, one of which was fitted with a DwarfConnection wireless transmitter for capture of beauty shots and the other mounted to a Polecam crane for shots over the top of the audience.

Blackmagicdesign

mediahaus

TEAM SKY'S NEED FOR RELIABLE CONNECTIVITY ON THE ROAD TO THE TOUR DE FRANCE

PROFESSIONAL ROAD CYCLING TAKES PLACE IN EXTREME ENVIRONMENTS – ALL WEATHER TYPES, ALL TERRAINS, AND IS CONSTANTLY ON THE MOVE IN REMOTE LOCATIONS IN DIFFERENT COUNTRIES AND CONTINENTS.

TOUR DE FRANCE 2018

MANAGING SUCH EVENTS IMPECCABLY AS PART OF THE UCI WORLD TOUR IS TOP PRIORITY FOR BRITAIN'S TEAM SKY THIS YEAR, AS THEY GEAR UP TO DEFEND THEIR DOMINANCE OF THE TOUR DE FRANCE FOLLOWING A WIN AT THE GIRO D'ITALIA IN MAY THIS YEAR.

Team Sky launched in 2010 and won the 2012 Tour de France when Bradley Wiggins became the first British winner in history, with fellow teammate Chris Froome as runner up. The team went on to win the Tour de France again in 2013, 2015, 2016 and 2017, as well as the Vuelta a España in 2017. As they head towards the Tour de France 2018, Team Sky is focused on adding another year to that list.

One of the ways Team Sky feels they can do this is by making sure that the team is connected at all times—a real challenge given the complexity and length of the course. The world's most prestigious bike race presents challenges posed by terrain, crowds, and weather, with stages often in remote locations. Faced with these connectivity challenges, they have teamed up with Dejero who has provided an in-vehicle mobile connectivity solution that they feel will give them a competitive advantage.

Dr. Scott Drawer, head of Team Sky performance support hub, explains that those supporting the team during a race can't always be close to the peloton so may not see or immediately understand what is going on. "We support the director sportiv (DS) a lot ahead of the race," said Drawer. "For example, in a team time trial, the DS may want some input into a race strategy based on physical modelling; in race, he may want weather reports as the stage is evolving."

"THE IDEA BEHIND USING THE DEJERO GATEWAY SOLUTION IS TO CREATE AN ADDITIONAL COMMUNICATIONS INFRASTRUCTURE TO ALLOW US TO BETTER SHARE VARIOUS DATA FORMS FROM DS TO RIDER AND VICE VERSA," SAID DRAWER. "GATEWAY'S ABILITY TO CONNECT TO MULTIPLE NETWORKS AND DEVICES MEANS WE CAN GET A TV SIGNAL WHILE THE VEHICLES ARE MOVING – MORE RELIABLY AND QUICKER THAN OUR COMPETITORS."

The DS is responsible for race strategy on race day, so it's a big effort from mechanics, soigneurs, and medical staff to ensure plans are executed appropriately. "If anything changes, we will need to be able to react and respond accordingly, quickly. Our need to adapt and be flexible every day is our biggest challenge," added Drawer. "There is constant communication between the riders and the second director sportiv (DS) car to share information on what is coming up to help reinforce strategy or to deliver information, for example the location of feeding zones."

In previous years, the only way Team Sky could get insight into the race was to watch it on TV! "We have portable TV systems in the car, but in extreme environments it is notoriously difficult to get a signal and even then, there could be a huge delay on that signal," said Drawer. "So we hear something on the race radio and see it on TV 30 seconds later."

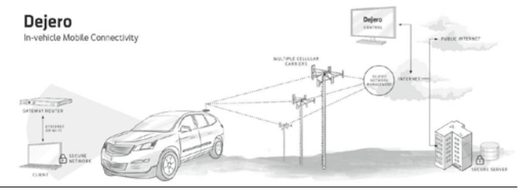
To overcome the connectivity challenges and help set the stage for another victory, Team Sky and Dejero have collaborated to install Dejero's GateWay mobile connectivity solution in the vehicles that follow their riders. GateWay enables Team Sky to monitor the live TV feeds in order to anticipate the route ahead of the cyclists, buying them precious seconds to prepare support tools in case of crash, injury, punctures, and other unforeseen events. These feeds are provided by television stations and Team Sky locks onto those through a video streaming process.
The unique network blending technology in the Dejero GateWay solution blends 3G, 4G, and LTE cellular connections from multiple mobile network providers to create a virtual network capable of delivering high-bandwidth internet connectivity. The software dynamically and intelligently manages the fluctuating bandwidth, packet loss, and latency differences of individual connections to choose the optimal path to route IP packets to their destination. The result is more bandwidth, speed, and reliability over a secure connection.

Dejero GateWay gives Team Sky additional reliability in ensuring they can receive and deliver race related information in all conditions, in all locations. Increasing the reliability and consistency of a signal enables the team to make informed decisions faster. The team already had radio and portable TV infrastructure in its race cars, but the addition of Dejero GateWay is about improving the capability of existing systems and adding other channels where other forms of data, such as the weather, could be shared.
"Remember, we will be constantly moving around a country that has stronger signals on some networks than others," added Drawer. "We need to be locked onto the strongest networks at all times to improve the probability of us understanding what is going on during a race and to deliver effective information and support at the right time."
Dejero and Team Sky's technical collaboration brings high hopes the team will see another victory at the 2018 Tour de France. When Team Sky tested the solution earlier this year they saw great potential. "Most importantly however, Dejero is supporting us throughout the journey to optimize their technology for our specific needs," continued Drawer. "We are in the early days of that process and the Dejero team has been extremely accommodating in customizing this solution for us. We have a long way to go, but the opportunity is significant, not just from a performance perspective, but also how we can begin to use the information for fans and to change the way people think about the sport."

Throughout the UCI World Tour, Team Sky has had the Dejero GateWay solution permanently installed in one of their cars, which they used in a number of races and will be crucial to the Tour de France. Team Sky is providing a test bed in a new realm of connectivity for the Dejero technology and putting it through its paces. "We provide a pretty harsh environment and no doubt will push the limits. If Dejero GateWay can work in our world, it will work in other worlds with ease."

"We love that the GateWay is easy to use. Having connectivity wherever we are in the race or training is the key functional requirement we desire, but in a way that does not add a significant amount of time and effort for us operationally. And when we get a video stream from a race that the TV can't provide, then we have proof the reliability is better."
This collaboration has allowed Team Sky to put in place an infrastructure that will help them make better decisions on and off the

race circuit. "The potential is huge," said Drawer. "We intend on rolling it out to our entire fleet and it could eventually be the only system we need in the car."
During the Tour de France, Team Sky's Dejero GateWay solution is helping them overcome challenges posed by location, crowds, and overall environment. Tour de France is set to be more challenging than any other race and is a true test of the capability of Dejero GateWay.
"We learned a lot using the Dejero GateWay solution during the recent Giro d'Italia and the signs are really positive about the potential of this solution in our harsh environments," concluded Drawer. "We are looking forward to Dejero's future development of connectivity solutions, new features, and software updates."
Like Team Sky, broadcasters are faced with connectivity challenges every day, particularly for the nomadic nature of crews covering breaking news and events. There is a real need to provide comprehensive, reliable and high throughput connectivity in any location to ensure remote crews have full access to the Internet along with the enterprise systems and databases that are secured behind the organisation's firewalls. In the past this has often been impractical when working remotely without advanced planning to establish connection paths and network engineers to set them up.



The GateWay solution eliminates both of these limitations and opens up a host of new possibilities such as VOIP communications with field crews, bi-directional data transfers for the fast upload or download of large files, and access to media asset management (MAM) and newsroom systems. It also opens up the possibility of greater automation and remote control of field equipment. With increased productivity and efficiencies, ultimately broadcasters save time and reduce their costs.

Photo Credits: © Russ Ellis | http://www.russellis.co.uk/

Dejero

GATEWAY WAS CRUCIAL TO TEAM SKY'S PERFORMANCE IN THE 2018 TOUR DE FRANCE. THE WORLD'S MOST PRESTIGIOUS BIKE RACE SAW DEJERO GATEWAY AID TEAM SKY TO OVERCOME THE CONNECTIVITY CHALLENGES POSED BY TERRAIN, CROWDS AND WEATHER.

ANDIAMO 2 / ANDIAMO 2.XT

MONTONE.42

TRANSITION TO IP BASED TRANSMISSION IN SMPTE ST 2110 ENVIRONMENTS.

The Society of Motion Picture and Television Engineers (SMPTE) has published the SMPTE ST 2110 Suite of standards "Professional Media Over Managed IP Networks" in response to the television industry's call for interoperability. This suite of standards specifies the carriage, synchronization, and description of separate elementary essence streams over professional internet protocol (IP) networks in real-time for the purposes of live production, playout, and other professional media applications.

SMPTE ST 2110 standards make it possible to separately route and break away the essence streams — audio, video, and ancillary data. Each essence flow may be routed separately and brought together again at the endpoint.

Vendors worldwide have developed equipment and software in compliance with these standards, and broadcasters can now confidently pursue their transition to IP.

While Media-over-IP-streaming marks state-of-the-art technology which is available now, its practical implementation may take some time. Existing systems need to be modified or extended to interoperate in an IP-based infrastructure. New systems involve questions about combinations of different components and failure strategies including redundancy control.

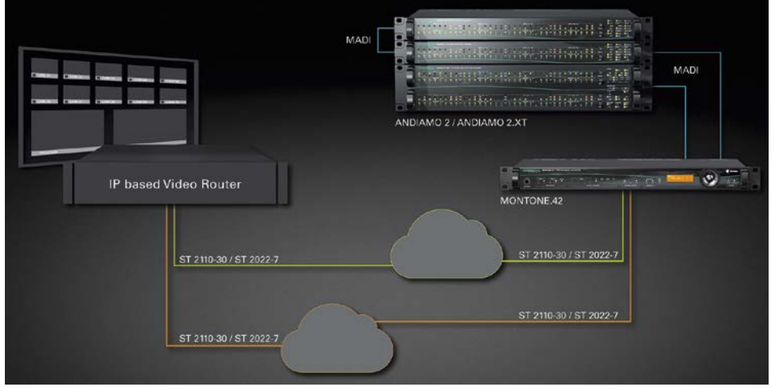
German manufacturer DirectOut offers solutions to integrate a high number of audio channels into an IP-based production system with redundant streaming by migrating existing edge devices, such as audio converters.

The ANDIAMO series of AD/DA converters offer reliable operation, a rich feature set and excellent sound quality at a minimum of required rack space - 32 channels I/O at 1 RU. Redundancy control of the two MADI I/Os offer automatic switch-over depending on the input signal state or prioritization of the inputs and redundant output feed, or doubling the number of MADI I/Os in extended mode.

MONTONE.42 is a MADI to RAVENNA bridge which is fully compliant with AES67 and the SMPTE standards ST 2110-30 (PCM Audio) and ST 2022-7 (Seamless protection switching of RTP streams). Equipped with four MADI I/Os it offers to interface up to 256 channels with networked audio as an aggregate device. The two network ports can be configured individually to either setup a fully redundant network transmission according to ST 2022-7 or to provide control data and audio data in separate networks.

Example - Integrating a high number of audio channels into a ST 2110 environment

SMPTE 2110 – Networked Audio & Video



HOW DOES IT WORK?

Two ANDIAMO 2 are daisy chained, using the full capacity of 64 channels per MADI stream.
The converters are connected to the bridge (MONTONE.42) via MADI.
The audio streams are configured and subscribed through a clearly arranged web GUI.

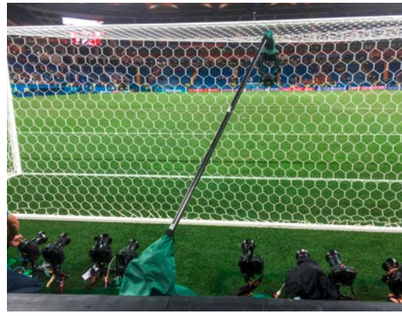
FACTS

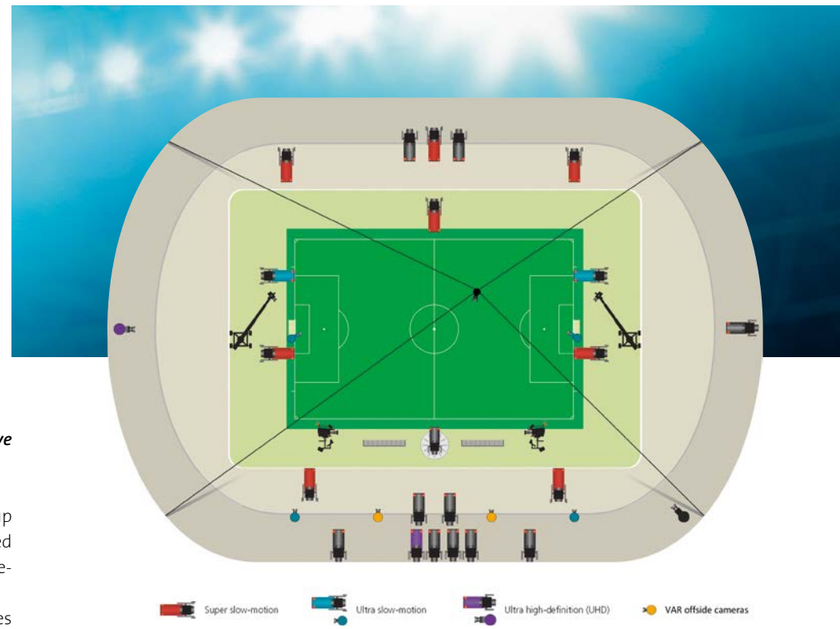
MONTONE.42
32 streams I/O
256 channels I/O
4 MADI ports
2 network ports (fully redundant)
Compliant to: ST 2110-30, ST 2022-7, ST 2059-2 (slave), RAVENNA, AES67

ANDIAMO 2 (XT)
32 channels analog I/O
32 channels digital I/O via 16 AES3 ports [XT]
2 MADI ports (with redundancy control)

DirectOut TECHNOLOGIES

FIFA WORLD CUP™ 2018





Camera plan and cameras in the arenas

Already dubbed the "best-ever FIFA World Cup", the 2018 FIFA World Cup™ came to a thrilling end in Moscow with the final between Croatia and France, with football fans and casual viewers alike following on TV around the world.

In many territories, broadcasters achieved viewing figures that matched and even bettered the consistently excellent audiences they had enjoyed right throughout a thrilling and unpredictable FIFA World Cup™ that kept football lovers everywhere glued to their TVs.

TF1's live coverage of Les Bleus' historic victory in the 2018 FIFA World Cup Russia™ Final achieved an average audience of 19.34 million viewers, equivalent to 33.2% of the potential television audience in France. Peak viewership was 22.21 million viewers, achieved during the award ceremony. A further 1.01 million viewers watched the Final on beIN Sports 1, bringing the combined average audience to 20.35 million viewers. This average audience was one of the highest in French history and the highest of any genre in 2017 and 2018. Meanwhile, it is likely that out-of-home viewing in France will ultimately see contribute to a much higher national audience, which may place the broadcast even higher in the historical context. 82.2% of people watching television at the time tuned into the coverage of the Final, a higher share of viewing than any other match in recent history, including the 1998 FIFA World Cup Final or the Final of EURO 2000, where France were also crowned champions.

In Croatia, an average live match audience of 1.538 million viewers (39.2% rating) watched the Vatreni's historic first Final on HTV2. The audience was actually marginally down compared to coverage of the national team's Semi-Final against England, which averaged 1.542 million viewers (39.3% rating). This is most likely a result of increased out-of-home viewing, with many viewers visiting fan zones, public screens and bars/restaurants to watch the culmination of their country's incredible World Cup run. Excluding coverage of the Semi-Final, this was the highest rated programme of any genre in Croatia since the 2006 FIFA World Cup™ (when a 47.0% rating was achieved for Brazil v. Croatia, equivalent to 1.95 million viewers). A market share of 88.6% was gained, the highest of the tournament in Croatia.

Massive efforts by FIFA TV / HBS to provides live match coverage for Media Rights Licensee

The core production plan for the FIFA World Cup match coverage called for 37 cameras to be used for each match, with the addition of two behind-goal pole cams for the knockout rounds.
At each of the 12 venues Host Broadcast Services (HBS) technical and production teams had set-up pre-configured (by Munich based system integrator sonoVTS) Equipment Room Containers (ERCs) connected to a small container village for Camera shading, vision mixing, sound mixing, record and replay areas and a Technical Operations Centre (TOC). The advantages of the ERCs were clear: they provide more room for the production team and obviate numerous onsite trucks.

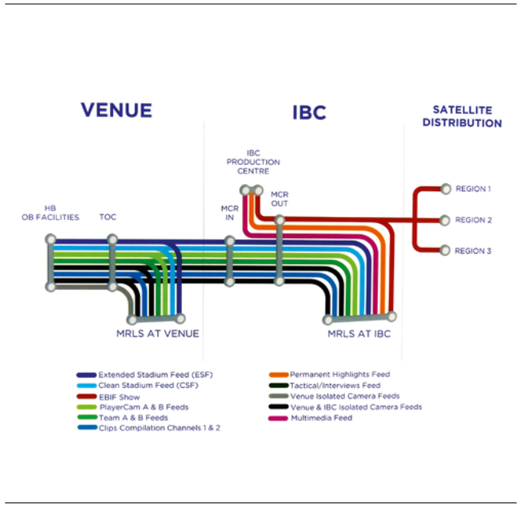
The ERCs already had proved ground at the FIFA WC 2014 in Brazil. However, for the production of the World Cup in Russia the containers needed to be upgraded to produce three video signals in parallel: 1080i SDR, 1080p SDR and UHD HDR. The UHD/HDR efforts at the FIFA World Cup in Russia had two layers of production formats in use: a core layer comprising cameras operating in 1080p/50 SDR mode (REC.709) with HD graphics; an enhanced UHD layer operating at 2160p/50 HDR (BT2020) without graphics. The HDR production format is OETF Slog3/Live, and the UHD feed (available only at the International Broadcast Center) relied on quad 1080p/50 at 3 Gbps to create the 4K-resolution image.

The vision mixers at each venue worked with eight cameras operating in dual mode, outputting UHD/HDR and 1080p/SDR; 11 cameras with dual output in 1080p/HDR and 1080p/SDR; 21 cameras in single-output 1080p/SDR; and all replays, which were 1080p/SDR.
The UHD/HDR output will took advantage of a dedicated camera at the Camera 1 position as well as seven additional UHD-camera positions. The remaining 11 single-speed 1080p/HDR cameras were all be upconverted to UHD's 2160p resolution (with HDR).

Sony Vision Mixer, Production Director Francoise Lanaud

All the 12 Venues are connected to the IBC in Moscow

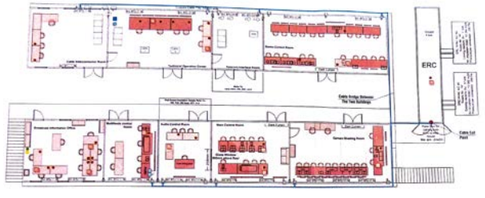
Technical Operation Center TOC



Multi-Feed Distribution

LiveU Equipment for some of the ENG Crews

Key to all the production efforts was a dual-layer workflow, allowing a single vision mixer and a single production team to create the three deliverables: 1080i SDR, 1080p SDR, and UHD HDR. The vision mixer delivered two of the three signals directly to rightsholders: a 1080i/SDR version and a 1080p SDR version. The UHD version was simultaneously created within that same vision mixer, relying on upscaling and colour mapping to create a UHD 2160p HDR BT2020 signal. That UHD signal was sent to the IBC via fiber and then processed and made available to rightsholders as UHD with HDR in three flavours: S-Log3, HDR10, and HLG. A "dirty" feed of each of the three formats included English graphics; an additional "dirty dirty" feed also included clock and score.
All camera signals were recorded on EVS XT 4K production servers in channel MAX configuration. The ERC was also home to the Sony camera control units, the Imagine Communications routers, multi-viewers and digital glue products, the Sony vision mixer electronics, the Lawo audio mixer electronics, the Riedel Artist intercom matrix, and the Lawo Virtual Studio Manager (VSM). Additional equipment like the Cisco IT routers, the Guntermann + Drunck KVM switches, the Genelec audio monitors, the Tektronix measurement equipment and the audio monitoring units from TSL and Sonifex as well as the furniture and monitor racks were supplied by system integrator sonoVTS.



HBS Container Village

Master Control Room at the IBC in Moscow

SonoVTS was also responsible for the 12 Technical Operation Centres (TOC): The TOC was located in additional portable cabins at each venue's broadcast compound and was the main distribution point and the interface between the production facilities, the MRLs and the telecommunications provider. The TOC was the main operational area for signal management. It accommodated all necessary equipment (routers, patch panels, audio, video monitoring, measuring and display equipment) and was connected to the ECR. Multilateral feeds received from the HBS production facility were distributed to MRLs on site and were send to the Master Control Room (MCR) at the IBC in Moscow. Unilateral VandAs to and from the IBC were also monitored and distributed via the TOC.

The IBC itself was located in the Crocus Expo International Exhibition Center northwest of Red Square, which was another primary location given the presence of MRL studios. The IBC was once again a massive place, with 54,000 sq. meters of raw indoor space, 8,613 sq. meters of multilateral areas, and 9,054 sq. meters for the unilateral production teams. The production center measured 3,329 sq. meters and housed seven studios; the largest, Televisa's, measured 300 sq. meters. The seven other studios were for Fox U.S., Fox Brazil, Telemundo, Televisa, Caracol TV, TYC Sports Argentina, and CCTV.

The FIFA World Cup coverage may seem straightforward, but the FIFA TV production team was providing a wealth of feeds around each match, including a dedicated production at each stadium on the days prior to matches. One gallery at the venue was used for the production of all the multifeeds. One goal was to provide faster access to team content, more warmup and fan coverage, and the use of a cine-style camera at each match to lend more visual quality to packages.
The core feed was the Extended Stadium Feed (ESF, also available in UHD) and its clean version (CSF). Those two feeds were available from 70 minutes before kickoff until 10 minutes after the match. A third feed was the EBIF Show, which was the same as the ESF as of kickoff but, before the match, offered bespoke content to MRLs.

And, with MRLs hungry for highlights, a Permanent Highlights feed began 10 minutes prior to kickoff, and was continually updated with new highlights during the match ending 30 minutes after the end of the match.

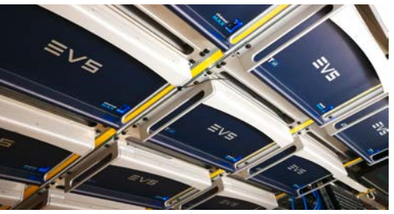
Production Personal Remote Cameras

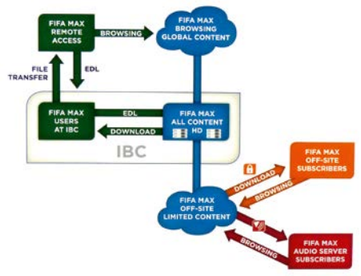
1x	Remote Cameras Project Manager
12x	Remote Cameras Team Leader
16x	Remote Cameras Technician
8x	Remote Cameras Rigger

Two interesting feeds were the Team A and B feeds and the PlayerCam A and B feeds: two channels were passed down one feed, with each channel dedicated to one of the two teams competing. Those channels included team arrivals, warmups, shots of fans for each team prior to the match, and, during the match, coverage of players and coaches on the bench. After the match, it offered flash interviews and mixed-zone interviews and press conferences. The PlayerCam feed had warmups, shots of players during the match, and post-match interviews.
Other feeds included the Tactical and Additional Content Feed (coach arrival interviews, dressing rooms, and, during the match, the tactical-camera feed); Clips Compilation Channel: Action (continuous sequences of match-relevant action clips); and Clips Compilation Channel: Emotion (relying heavily on ultra-motion footage of fans, player reactions, and more). The Clip Compilation Channels were actually produced by two teams working at the stadia and were also delivered as files or as SDI playout for linear needs. The goal was to make the clips available as close to live as possible.
As if that is not enough, FIFA made 10 isolated camera feeds available, including key cameras: Camera 1, the cameras on the 16m line, a high behind-goal "tactical" camera, the cable cam, and the UHD/HDR tactical camera.

Remote Cameras by TV Skyline

Tactical Shot	***12x***	TV SKYLINE GENTLE:MOTE
Ingoal Cam	***8x***	2 TV SKYLINE HD:1200 with wide-angle lens and improved in-goal mount
Tunnel Cam	***12x***	TV SKYLINE QUBE:CAM II
Beauty Sho	***12x***	TV SKYLINE / IOI IO4K
Com Cam	***8x***	10 TV SKYLINE QUBE:CAM with wide-angle lens and two LED lights each
Press Conference Cam (only in Moscow)	***1x***	TV SKYLINE QUBE:CAM II
Outdoor Beauty Shot (in Moscow only)	***2x***	TV SKYLINE / IOI IO4K with remote-head and RF link





The FIFA MAX Server

HBS Staff at the FIFA World Cup in Russia

The production team in Moscow at the IBC was complemented by 40 ENG crews (comprising 120 people) covering each team and gathering footage from practices, interviews, location beauty shots, and more. With so many MLRs interested in what is going on with every team, the FIFA TV team had tackled the issue of how to keep everyone happy without having dozens of crews following a single team: there was a dedicated FIFA TV crew for each of the 32 teams. Those crew members spoke the native language and covered everything from daily training to press conferences and even exclusive interviews.
Social-media coverage and even 360-degree videos were also part of a plan that offerd roughly 300 hours of raw content to rightsholders daily. Their work began well ahead of the actual tournament: they covered team arrivals and filmed each team for chroma-key needs. The chroma-key filming was done for all 32 teams and match officials, with each person doing one move and players filmed doing individual celebrations.

In addition, eight production teams were creating approximately 50 hours' worth of feature stories and coverage of fans and FIFA World Cup celebrations.
Selected FIFA TV crews have also relied on eight LiveU units to cover arrivals, breaking news, pre-match training (if away from the stadium), press conferences, and Fan Fests. Those eight units were also used to cover the final eight teams and deliver 1080p/50 signals to the IBC using the LiveU store-and-forward function at 15 Mbps.

The type of features produced by FIFA TV reflected the explosion in not only interest in the FIFA World Cup but also digital platforms that make it easier for MRLs to deliver content that, historically, would not have made it to air on TV. For example, the production team createed a 2.5-minute-long feature on each team per match, a 90-second daily update on each team, and three 2.5-minute feature stories for each match. In addition, 130 match promos and 90-second stats-and-facts features were created for each match.

Video Assistant Referees at the IBC in Moscow

One of FIFA's key service offerings was the FIFA MAX Server, with its revolutionary FIFA Content Interface. The goal was to provide MRLs easy onsite and offsite access to a server containing all the content created. Predefined categories made it easy for users to find what they needed, and filters could even be tied to alerts and email notifications so that, if clips for a specific player or team were available, the user could find out immediately. In addition, a support team offered daily contact to MRLss to let them know about the best content.
For the first time at a FIFA World Cup the Video Assistant Referees (VAR) were part of the matches, centrally located at the IBC in Moscow. The VAR teams had access to all relevant host-broadcast cameras plus two dedicated offside cameras and supported the match officials during all 64 matches.

For the knockout phase, two additional ultra-slomo cameras were installed: one behind each goal. Slow-motion replays were used mainly for factual situations: for example, to identify the point of contact of a physical offense or the position of an offense. Normal speed was used for subjective judgments: for example, the intensity of an offense or to determine whether a handball was deliberate.
Hawk-Eye Innovations was providing the video-related technical support; Crescent Comms was supporting audio needs. The VAR also made use of virtual offside lines, computer-generated lines projected onto the broadcast image of the field of play to help the VAR determine whether an offside offense had occurred. The offside lines used are the best possible and the most accurate that can be generated with existing technology, thanks to calibration using multiple synchronized camera angles.
Angle of view, lens distortion, field curvature, and many other factors are considered in calculating the true position of the lines. Calibrations were done before each match by the technology provider to take into account the exact pitch dimensions and conditions on the day. For determining offside positions, the VAR team had access to various tools, which have been validated in a number of tests across different venues by an independent third party using survey-grade equipment.
Following the exciting 64 matches of the 2018 FIFA World Cup™, FIFA has invited the head coaches and technical directors of all 211 member associations, as well as the technical experts of all six confederations, to the FIFA Football Conference to be held on 23 September 2018 in London, the birthplace of the modern game.

The purpose of the conference is to analyse FIFA's flagship competition from a technical and tactical point of view, identify trends and compare the main findings with previous editions of the FIFA World Cup based on the report by FIFA's Technical Study Group (TSG), which is due to be presented at the conference. The event will also comprise discussions about the implementation of VAR and its impact on the game.

INDEX

Advertisers

IMPRINT

Live-Production.tv GmbH
Ubierring 13
D-50678 Köln

Amtsgericht Köln, HRB 68016
USt-IdNr: DE 268824934

Office
Ubierring 13 | D-50678 Köln
Tel +49 221 31 03 045
contact@live-production.tv

Editor in chief
Reinhard Penzel
reinhard.penzel@live-production.tv

Art Work
Hoch Zwei GmbH
www.werbung-text-design.de

Media Sales
OttoDoraEmil
Evelyn Ode Marketingberatung
Tel +49 89 41 55 97 02
Mobile +49 173 73 09 545
advertise@live-production.tv

Printed by
F&W Mediencenter GmbH
Holzhauser Feld 2
D-83361 Kienberg

Internet
www.live-production.tv

PURE LIVE is a special of
Live-Production.tv GmbH
Price: 25,00 EURO
plus shipping

XT-VIA is the latest addition to EVS' iconic range of XT servers, delivering the fastest and most reliable live replays in the market. With up to six channels of UHD-4K and 12+ channels of Full HD 1080p or HD, all in flexible I/O combinations, you are given the choice to execute productions in any resolution from the same server.

The next-generation server supports High Dynamic Range (HDR) for a richer, more vivid live coverage of the action. XT-VIA also uses SMPTE ST 2110 to power super motion replays in IP workflows and sets the foundations of EVS' new VIA technology platform, enabling future capabilities for years to come.

IBC 2018
BOOTH
#8.B90

For more info, go to www.evs.com/xt-via

UNRIVALLED
IN PERFORMANCE

Canon's UHD lenses not only achieve the outstanding resolution and grayscale characteristics that UHD images require, they also minimize color blur and outline coloration and various other kinds of aberrations to a high degree of accuracy. These lenses are designed to achieve superior balance between the high-grade resolution power and the contrast expected of UHD images from the center to the edges throughout the entire zoom range, besides offering high levels of both operability and applicability.

INNOVATION
In TV Optics Since 1958

Canon

4K BROADCAST LENS SERIES	Wide	Standard	Tele	
Field	4K Premium	4K	4K Premium	4K
	UJ27x6.5B	NEW UJ66x9B	UJ86x9.3B	UJ90x9B
Portable	UHDXS			
	CJ12ex4.3B	CJ20ex7.8B	CJ45ex9.7B	CJ45ex13.6B
	UHDGC			
	NEW CJ14ex4.3B	NEW CJ18ex7.6B	NEW CJ24ex7.5B	

Canon