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Special Edition
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LIVE PRODUCTION

DIRECTORY 2016 UHD | 4K

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The Business of Live Production

Bracing 4K Production

Although HD productions still represent the vast majority of sports and show events today, 4K is undoubtedly on the horizon. Content producers are looking for solutions that serve their needs today while they prepare for future 4K needs. However the Sky Q platform in the UK plans to produce 124 Premier League matches in 2016/17 while BT Sport continues to broadcast football and rugby matches in addition to UEFA Champions and UEFA Europa League matches and other live events like MotoGP races. With this in mind we had a closer look to available 4K OBVans and are happy to present 24 trucks in quite detail (page 62 – page 154). The presentations include trucks from AMP VISUAL, Arena, Clark Media, Croatel, Dome Productions, Euromedia, Gearhouse, Hunan TV, JSBC, Mediapro, Mobile TV Group, NEP, Telegenic, Timeline\TV, TopVision, TV Skyline, TVN and Videohouse. In addition we cover the production of the UEFA EURO 2016 in Paris (including the 4K production of eight matches, page 6), a review on BT Sports UHD, the UK's first 4K channel (page 22), a preview on NEP's new 4K OB fleet (page25), the 4K production of the UEFA Europa League final (page 20), and the 4K test at the MotoGP in Silverstone (page 58).

High-End Sports Production

45 cameras around the track, 52 wireless cameras in the cars non-stop in operation for 24h - this is Le Mans. A team of 350 AMP VISUAL TV staff members worked for almost one week to finally get the live signal on air and to serve 30 international broadcasters (page 14). Similar demanding was the production of the European Rowing Championships in Berlin because some of the cameras were positioned on catamarans to follow the action on the water (page 31). There are 33 trotting tracks throughout Sweden which host almost 1,000 race events every year. Per Tellander gives us an inside view on how Kanal75 is amping up Swedish trotting state-of-the-art tracking and on-screen graphics technologies to enhance race broadcasts and betting intelligence (page 44). Rounding up our focus on live sports productions is a view on the Tour de Azerbaijan (page 28), to the TripleCrown Triathlon Challenge in the Middle East (page 55) and to the intercom solution for the Formula E championship (page 52).

Remote Broadcasting and IP Infrastructure

More live sports content is produced today than ever before; college sports are regularly televised and live-streamed. Since many of these productions generate little to no revenue, they require a different production approach. San Francisco's Pac-12 Networks leads the field in remote broadcasting with a unique production model which allows to broadcast more than 850 live events every year. Over the past four years Pac-12 has developed this model of broadcasting and is now inspiring others to do the same (page 34). A different approach towards cost-effective broadcast solutions is taken by Hitachi together with Gearhouse in the Middle East and in South Africa. From its state-of-the-art design and manufacturing center in Istanbul Hitachi has developed a range of compact and versatile OB vehicles (page 198).

Reinhard Penzel
reinhard.penzel@live-production.tv

LIVE PRODUCTION

Bringing Music to the Masses

For dance music aficionados, Ultra Music Festival (UMF) and its related events are global hot tickets. However, the year's biggest showcase of UMF takes place in Miami. With eight stages featuring the biggest names in the business, it's dance music heaven. And for all those who are not able to go to Miami, the festival has created its own YouTube channel (page 184). A similar approach is taken by the VESTROCK festival in the Netherlands. Live events extend the audience beyond the walls of a stadium or a concert hall and spread it to the largest audience possible. Engaging fans not only on site, but also on any existing device is meanwhile a widely used way of production (page 186). Same is true for the Montreux Jazz Festival: it would have been a pity if these concerts could be enjoyed exclusively by the visitors on site (page 168), and the Royal Opera in Stockholm which decided to create a cinema cast to reach out to people all around the country (page 164).

Show Lighting

Without light there is no image. Therefore we present two high profile and very different examples of show lighting: Example one is Adele's "Hello" and example two is "Armin Only Embrace". Both solutions feature more than 100 moving lights. The lighting concept for Adele was developed by Woodroffe Basset Design (WBD) while Armin relied on his long term lighting director Michael Seeverens from The Art of Light (page 158).

Enjoy.

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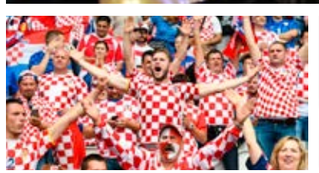
TECHNICAL SYNOPSIS

WITH 24 TEAMS COMPETING ACROSS 10 HOST CITIES AND 2.4 MILLION SPECTATORS ATTENDING AN UNPRECEDENTED TOTAL OF 51 MATCHES, UEFA EURO 2016 WAS OFFICIALLY THE BIGGEST UEFA EUROPEAN CHAMPIONSHIP EVER.

Euro 2016 proved the power of live TV, its capacity to bring people together and its emotional impact across generations. Broadcasters throughout Europe have reasons to be proud of the audience figures achieved during the championship. Live sports events such as the Euros are usually enjoyed on TV sets.

However, TV is now available everywhere and on every screen, and more and more viewers can watch games on tablets, smartphones or computer screens – either live or on-demand. The fully audited global figures for the matches will not be known for some time, but broadcasters are already confident that the numbers for the France – Portugal final have surpassed the 299 million viewers worldwide who watched the Spain – Italy final in 2012.

From 10 June to 10 July more than 2,000 host broadcast (HB) production staff were working across France at 10 separate venues, as well as at the International Broadcast Center (IBC) in Paris to produce the international TV signals and the Next Generation Services (NGS), which included digital components to enhance traditional solutions. The event is the culmination of years of planning with a focus on technical innovation that best meet the needs of rights holders and fans around the world.
The tournament was carried by 150 broadcasters across 238 territories, with 40 of those 150 broadcasters on-site at the Paris IBC. And it was a big deal across France with the HB staff managing a 70,000 kilometer fiber network, 1,200 kilometers of cable, and delivering more than 2,000 hours of content. Visiting broadcasters were able to customize their productions with over 40,000 unilateral booking lines coordinated by the UEFA broadcaster services team.
The production placed a priority on live coverage, including pre-, post-, and in-tournament coverage that delivered a complete programming package. All matches were produced in 1080i/50, using 38 live match cameras at each match, and an additional 10 cameras covering other events surrounding the match, including team arrivals and fan coverage.



Directors are Key

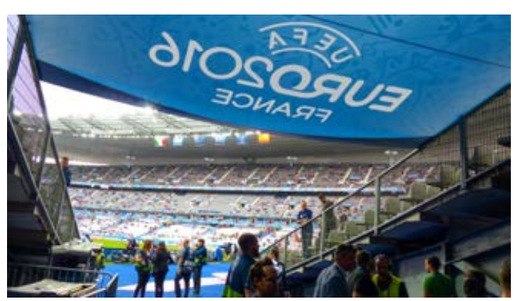
Selected from their pool of cross-competition talent, the UEFA HB was using five extremely experienced match directors with their dedicated teams – Jean-Jaques Amsellem, Knut Fleischmann, François Lanaud, Jamie Oakford and Laurent Lachand – to oversee their live productions: Paris and Saint Denis; Lyon and Saint Etienne; Lille and Lens; Bordeaux and Toulouse; Marseille and Nice. Each of the venues featured a dedicated OBVan company with trucks for the multilateral coverage. These companies were NEP (Belgium), Euromedia (France), Telegenic (UK), AMP Visual (France) and NEP (Sweden). All replays were housed outside the OB trucks by a centralized solution provided by EVS. Also a FANtertainment OBVan was on-hand to create content for the giant screens in the stadiums. This unit was also planned to function as a backup to the main production OBVan.

Match coverage was complemented by a wide variety of additional content that gave rights holders plenty of opportunities to build in-depth feature pieces and more. Already prior to the tournament UEFA has shot footage from each of the 10 cities that were hosting matches, UEFA was producing magazine shows during the tournament, offering pre-produced promos and even player and team profiles. In total there were 43 ENG crews covering the action and more across France.

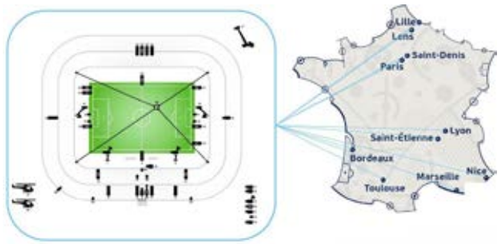
UEFA kept the tournament alive for all its 31 days and while some of the broadcast partners inevitably focused on their team, UEFA delivered the tournament to everyone. UEFA brought football to life on the screen and there was more demand for content across digital platforms and channels. And that area will grow and grow in the years to come as social media platforms and broadcasters push people to their content.

Match Production at the Venues

A minimum of 38 live match cameras covered each game in High Definition and in Dolby 5.1 surround sound. From the quarter-final matches onwards, 46-cameras were the standard. These 8 additional cameras included one additional mini-camera behind each goal, a remote robotic camera in the players' tunnel, a remote robotic camera in the press conference room and another helicopter camera. The multilateral world feed, or Live Stadium Feed (LSF), was available in English, with ten lead and color commentators which were used across the entire tournament.
The LSF was the main match feed. It contained all the build up to the match, the match action and post-match highlights.

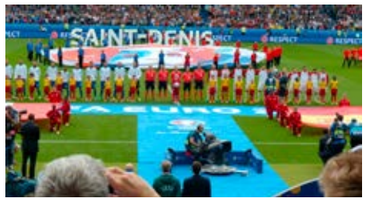


In addition to the LSF, rights' holding broadcasters (known as UEFA Broadcast Partners or UBPs) had access to 11 additional feeds to enrich their coverage. These were Camera 1, Clips 1, Clips 2, Team A, Team B, Player A, Player B, Tactical, Stadium Beauty, Stadium Aerial. Five ISO cameras were also available: 16m left, 16m right, high behind goal left, high reverse stand and VIP venue. Other, non-bookable ISOs, were used and made available via the two dedicated Clips Channels, ensuring UEFA BPs had access to all the match action. Both ISOs and feeds were available at the stadium venue and at the IBC.

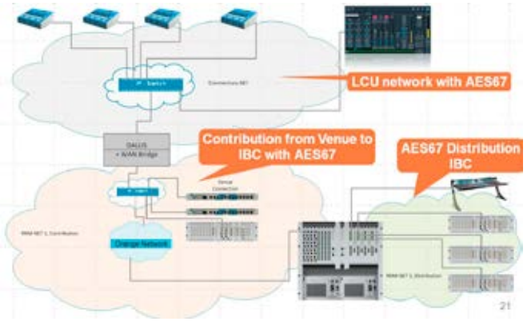


Clips channel 1 and 2 provided a selection of unseen camera angles, along with real-time and slower, longer versions of in-match replays. Team A and Team B feed cameras were located in the reverse stand and focused on each team's bench. They provided coach and bench reaction shots throughout the match. The Tactical feed was an uninterrupted feed from the main match camera (Camera 1) used for match analysis. Pre-match this feed carried the helicopter signal.

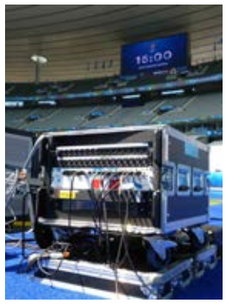
UEFA HB also delivered a variety of specific bookable positions, including pitch presentation positions, announce platforms, pitch-view studios and TV compound stand-up positions. Dedicated UEFA HB venue operation teams were based at each stadium to oversee and manage the unilateral service delivery, as well as the multilateral production.

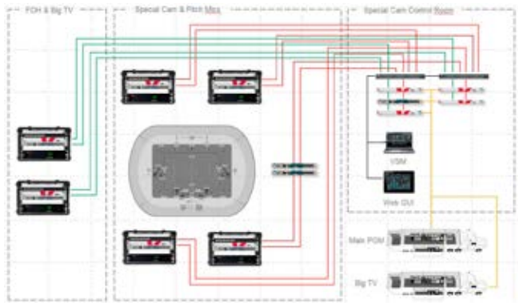


Already at the last FIFA World Cup in Brazil, HBS had developed a completely IP-based commentary system. This solution, which uses Ravenna AES67 as transport method, was implemented at the 10 venues in France. It involved 600 Lawo LCU commentary units (60 per stadium), 60 Lawo LCC commentary control PCs and 46x Lawo DALLIS modular I/O units for audio breakout (three at each venue, 16 at the IBC).

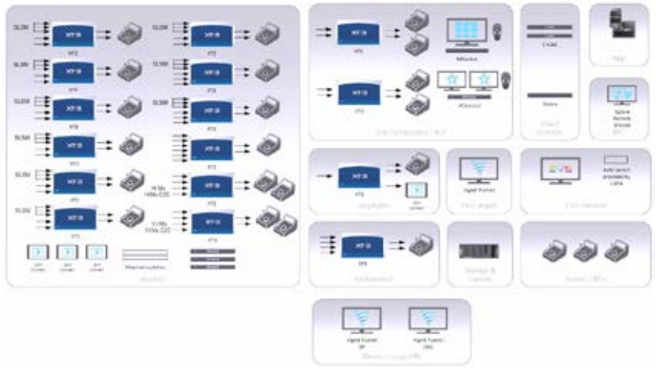


Three aerial systems were used at each stadium – an innovation that has been present since EURO 2008 – namely, one Spidercam, one helicopter (during the group stage, with a second added during the knock-out rounds) and an external beauty camera mounted high outside each stadium. Gearhouse Broadcast was selected to deliver the Technical Operations Centers (TOCs) and Cable Interconnection Rooms (CIR) at each of the ten EURO 2016 venues. Gearhouse also provided the special cameras and the EVS slow-motion operations facility at each venue. Each TOC was responsible for distribution of the live stadium - or 'world' – feed (LSF) from each venue to the IBC for worldwide distribution. The venue TOC also passed the feed to the nearby CIR where it was distributed direct to UEFA BPs with an on-venue unilateral presence. The CIR was a cable interface hub, which acted as the central demarcation point at each venue. The stadium special cameras facility was responsible for receiving feeds from the helicopter cameras, the Antelope in-goal cameras, the handheld RF cameras, the Spidercam and the stadium 'beauty' shot. To collect all these video signals together with audio signals from the microphones in the stadium, UEFA had selected a Lawo IP-centric solution based on stageboxes within the stadium. At all the 10 stadiums the signals were collected via the stageboxes around the field of play with V__link4 video-over-IP interfaces (12 pro venue) and A__mic8 (13 pro venue) which converted analogue audio into IP. These outputs (controlled by Lawo VSM servers) were delivered to the special cameras control room. From there the signals were handed over to the EVS slow-motion facility and finally to the production trucks at the stadium.



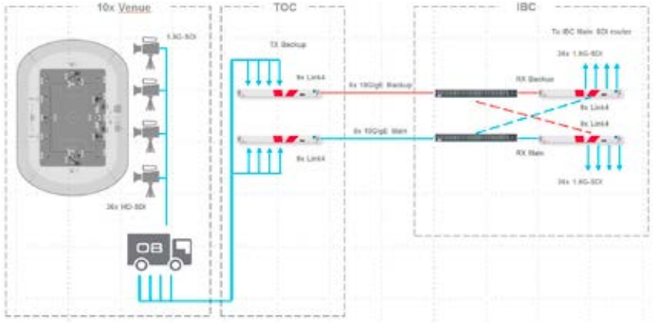


The EVS slow-motion facility saw 16 XT3 live production servers, 12 servers recording up to 48 camera feeds, including SSM and Hypermotion, 2 servers for clip compilations and storytelling, including best match actions using MultiReview and emotional reactions of players and fans using IPDirector. The remaining two servers were used to produce match highlights with LSM Connect and to produce the in-stadium fan entertainment program for the big screens.
Also housed in the slow-motion facility was the equipment for the C-Cast multimedia distribution platform (one C-Cast agent connecting content to the C-Cast cloud for the delivery to mobile apps and one C-Cast agent for the delivery of High-res media to IBC) and the Ingest Funnel to plugin and ingest ENG content for the transfer to the IBC.



Venue to IBC

The UEFA/EBU VandA project was the IP-based signal contribution from each venue to the IBC and was based on fiber connections with a capacity of 2TB/s provided by Orange and with hardware on both ends provided by Lawo. Lawo delivered 264x V__remote4 (19-20 per venue, 73 at IBC), 2x redundant Lawo VSM servers at the IBC, 2x Lawo VSM LBP51 panels at MCR, 12x Lawo VSM softpanels, 2x Arista 7504 (each with four blades) and 26x Cisco SG300 (two at each venue, six at the IBC). Via the IP-based VSM control system, the operator selected the desired stadium and the signals were routed automatically, switching within seconds from one stadium to the next. In workflow terms this was a big step forward, saving a lot of time and reducing risk as it was always the same process – no need to change fibers at venues on match days and no worries about issues around damping and line connectivity.



The ENG Teams

There were also 43 ENG teams spread across the different venues and training camps in France, delivering team, cultural, sponsor and behind-the-scenes programming. As well as the bookable feeds and ISOs, UEFA TV Production provided broadcasters with a wealth of additional programming material to supplement their productions. This material included raw and 'turnkey' content produced by the 24 dedicated crews following each team at the tournament. UEFA also delivered footage of the teams arriving at the stadium the day before the match, pre-match press conferences and post-match interviews, as well as the build-up and reaction in the host cities and dedicated fan-zones.
The ENG crews were connected via the Ingest Funnel at the venues to transfer their materials to the IBC. The same was true for the broadcast partner's materials. EVS had installed two Ingest Funnels at each venue and also had delivered 24 Ingest Funnel Lite to each ENG crew following the teams.

Production at the International Broadcast Center

The International Broadcast Centre (IBC) was located at Paris Expo, Porte de Versailles, inside Halls 6 and 8. Construction work on the 30,000 square meter facility began at the end of March, with UEFA BPs moving in from 16 May onwards. Alongside studios, galleries and commentary booths, there were office space and edit suites. The galleries included equipment from Sony and Barco, whilst the edit suites were equipped with Adobe systems.

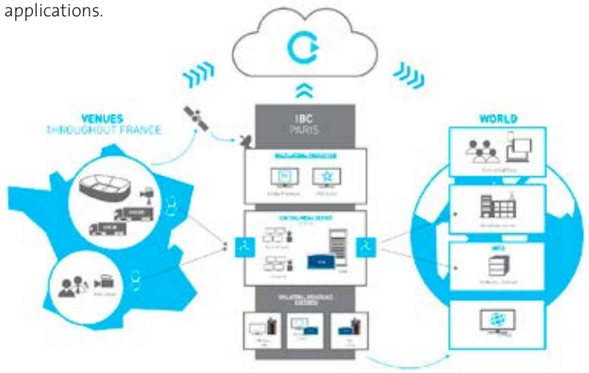
Beyond that, there were restaurant facilities, laundry, postal services and a tourism desk. Around 800 UBPs and UHB staff operated the IBC during the course of the finals.
Host Broadcast Services (HBS) was providing the planning and engineering for the IBC project – both in terms of the general construction and the broadcast engineering project. This included the provision and the commissioning of a turnkey Master Control Room (MCR) and a Central Equipment Room (CER). HBS managed all IBC technical operations during the event, and provided and deployed Commentary Units (CUs) at all venues and supported all attending UBPs.

At the IBC all the multilateral feeds from the stadiums were received. Here the signals were quality controlled before they were distributed across the world to the 150 UEFA broadcast partners. A total of 816 broadcast feeds were delivered to the MCR from the venues during the tournament. This amounted to over 2,000 hours of content.
The MCR was the audio and video control center where the switching of all multilateral and unilateral feeds and signals took place. UEFA brought back 16 separate feeds from each venue to the MCR for distribution to broadcasters. These 16 feeds covered all angles of each game and allowed broadcast partners to completely customize their coverage.
Next to the MCR were the two most important rooms in the IBC, the Central Equipment Room (CER) and the Telecom Interface Room (TIR). The 70,000 km of diverse fiber lines from the stadiums to the IBC, delivered by Orange terminated in the CER on the Lawo hardware.

LIVEX – Central ingest and media Platform

The CER hosted LIVEX, the central ingest and media platform: 11 live feeds were recorded per match in HD and LowRes Proxy (up to 48 feeds were simultaneously recorded on match day 3). In addition all press conferences and interviews, the contribution from the ENG crews, the multi-angles from C-Cast as well as advanced edits of highlights, player profiles and special features were recorded onto LIVEX. The LIVEX infrastructure consisted of nine EVS XT3/XS servers and an XStore SAN shared storage with a capacity of 4,000 hours. It also included an IPDirector production asset management suite with 13 IPDirector stations to log content and the IPLink to the Adobe Premiere Pro edit desks.

The LIVEX IBC service was available to broadcast partners who had technical space at the IBC and connected them directly to the UEFA EURO 2016 media server. Content could be browsed both at the IBC and remotely, while broadcast quality files could be delivered to partners' technical space at the IBC or to their home premises as an optional extra. LIVEX Remote – Full Edition was a new service for UEFA EURO 2016, providing subscribing partners with the opportunity to access all material produced during the tournament from their home premises. Content could be browsed, selected and clipped remotely and was delivered to their premises through the pre-installed EBU box. LIVEX Remote – Additional Programming enabled partners not located at the IBC to preview and receive additional programming content – again delivered to their premises via the EBU box. The LIVEX Internet and Mobile module enabled partners to search, preview and directly download match-related video clips in various formats for internet and mobile applications.



Next Generation Services (NGS)

Beyond the 'traditional' television services, UEFA also provided broadcasters with a range of cutting-edge digital media services to ensure EURO 2016 viewers could access content from the tournament on more platforms and devices than ever before.
These services were offered to broadcasters from UEFA via deltatre as digital components, Software Development Kits (SDKs) and stand-alone 'turnkey' solutions. They included a live match streaming player and separate video streams, match-highlight clips, data feeds and VOD solutions for tablets and smartphones.
UEFA HB had tasked Deltatre to deliver player tracking systems at every venue.

For broadcasters who presented their studio show as if they were in pitch-view UEFA EURO 2016 offered a live studio backdrop service. The stitching of an ultra-high resolution four-camera array in each of the 10 stadiums allowed to produce a 7,000 pixel wide x 1080 pixel high immersive experience. Takers were ARD & ZDF at their studio at the IBC and TV4 Sweden who was using the streaming service to get the signal delivered to their premises in Sweden.

The success of the tournament was mirrored on UEFA's digital platforms, where previous traffic records were shattered. Over 300 million visits and 1.5 billion page impressions were generated by the official EURO2016.com website and mobile apps between the eve of the tournament on 9 June and the day after the final on 11 July – almost four times the levels reached during UEFA EURO 2012.

A mobile-first approach was adopted for the first time ever at a EURO, with the website design responsive to screen size for optimal content consumption. The desktop and mobile versions attracted an audience of over 140 million visits, driven by the success of the revamped MatchCentre.

UHD/4K Production

For the first time in EURO history, eight matches – the opening, quarter-finals, semi-finals and the final – were offered as full 4K UHD productions. Fourteen 4K UHD cameras at each venue captured the match action in UHD. UEFA had commissioned Telegenic, AMP Visual, ACS (4K helicopter), and TV Skyline (4K internal 'beauty' shot) to deliver the 4K signals.
Telegenic (T21 and T25) and AMP Visual TV (Millenium Signature 12) provided the 4K OB trucks at the eight matches on behalf of UEFA HB, with Telegenic delivering six matches — three at St Denis, one at Lille & two at Marseille – and AMP Visual two matches in Bordeaux and Lyon respectively.

The 4K signal was distributed to the IBC through a redundant fiber network. The signal was also distributed via satellite directly from the venues to Europe, with the fiber network as a backup to the satellite distribution. The European satellite carried the 'dirty' feed and the clean feed was brought back to the IBC via the 70,000km fiber network delivered by Orange, on behalf of UEFA/EBU.
The live 4K feed was delivered as a quad HD-SDI 1080p 50 (3G) signal and there were ten takers worldwide (China, India, Brazil, Japan) for the UHD production plus TF1 and M6 in France. The clean feed brought back to the IBC also provided broadcast partners located there with the opportunity to embed own-language graphics onto the feed in 4K UHD. These graphics were keyed synchronously with the multilateral graphics at the venue. With the 4K signal Dolby Immersive Audio was implemented, delivering in addition to the crispy picture an incredible sound experience as well.
These 4K tests at the EURO 2016 provided a valuable opportunity for UEFA to review new production technology and workflows ahead of the incredible project that will be EURO 2020.

UEFA EURO 2020

UEFA EURO 2020 will be a unique event in Europe and football history. Played across 13 countries, in 13 stadiums the heart of the TV match coverage will be to capture the spirit of this 'EURO for Europe.' That event, no doubt, will be the result of the hundreds of football matches that UEFA TV production either provides host broadcast support, or delivers as host broadcaster every year. This cross-competition experience provides ample opportunities to figure out new workflows, embrace new technologies, and meet the needs of football fans and rights holders all around the world.
UEFA already tested various virtual reality (VR) systems in a live and as-live environment across the EURO tournament, providing an opportunity to evaluate the VR equipment, footage, technical workflows and key editorial positioning around the match that will best add production value and eventually meet broadcast partner and sponsor requirements.
"The virtual reality, 1080p, HDR, HFR, and 4K UHD remote production tests we've conducted across EURO 2016 have all been with EURO 2020 in mind" said Bernhard Ross, Head of UEFA TV Production. "Building on the success of UEFA EURO 2016, the philosophy of 'the best seat in the house' will be extended and enlarged to reflect the scope of EURO 2020, from east to west and stadium to sofa. The key to this immersive and Europe-wide delivery will be a Europe-wide transmission network and, in the IBC — whether virtual or physical — a central hub for the distribution of feeds and content."

Nicolas Bourdon, EVS SVP Marketing – Bernhard Ross, Head of UEFA TV Production

"The virtual IBC is not here yet. IP is not here yet. However, by 2020 a lot will be different. I think there will be both: a physical structure, which is an IBC, and a series of virtual services. The more we think into the future everything will be about virtualization and decentralization," Ross continued.
"From Champions League to EURO 2020, we want to have the same philosophy. Broadcasters will always want to send their talent to the venue. They'll always want to be pitch-side. But maybe they'll also want to have one studio that can do multiple games. Take the BBC for example: the BBC's output on other platforms doesn't change during the EURO. They don't stop using their existing edit suites. They actually need more capacity. So they come here to the IBC because we build edit suites for them. We build temporary capacity, they use it, and that helps. Should we be able to deliver a virtual IBC, they would still need that extra capacity," Ross concluded.

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MILLENIUM SIGNATURE 12 AT THE 24H OF LE MANS

Only an exceptional event could be the maidenly broadcast for the exceptional OBVan from AMP VISUAL TV. So AMP VISUAL TV decided to debut the Millenium Signature 12 (MS 12) at the world's most famous endurance race in Le Mans. With the production of a 24-hour non-stop program for 30 international broadcasters for the delivery to 35 million spectators in 190 countries, the target was set very high.

45 cameras were positioned around the circuit, 52 wireless cameras were mounted on board of more than a dozen race cars (3-4 in each car), on a cable cam above the 360m long pit lane, in a helicopter and also an i-movix hyperslomo was operated wireless. All this was orchestrated in MS12's comfortable working environment, where on 76m² of space two international signals were produced: one for the pit lane action and one for the race itself.

Next to MS12 in the broadcast compound was the Extender 5 RF. This truck was programmed to capture the 52 signals from all the RF cameras and to send a pre-selection to MS12. The delivery of this selection of the 3-4 camera signals arriving from the cars was a mammoth task but worth the effort, because the viewers felt like they were sitting in the car together with the drivers. Backbone in the MS 12 is a Riedel Mediornet with close to 100(!) nodes which handled the 97 camera signals from around the track and from inside the racing cars seamlessly – decentralized video routing at its best.

Graphics and slow motion were managed by two more units: the Extender 2 and the Extender 3, complemented with augmented reality, this made for an incredibly dynamic broadcast with graphics embedded in the images using live tracking.

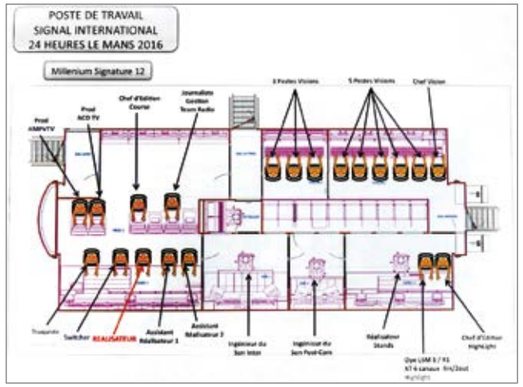
The Optimum 6 and Optimum 9 OB trucks completed the technical resources for Eurosport International and Eurosport France while Coach 10 and the IXI PROD truck worked in tandem for the UK channel Quest TV.
The coverage of the race was further enhanced by a special second screen application where AMP VISUAL TV guaranteed the streaming of 23 sources to enhance the private events of some of the participating car manufacturers. The experience went even further because AMP VISUAL TV introduced another first: A 360° camera was mounted onto a race car and the images were available as VOD to spectators giving them the chance to see the race from a complete new angle.

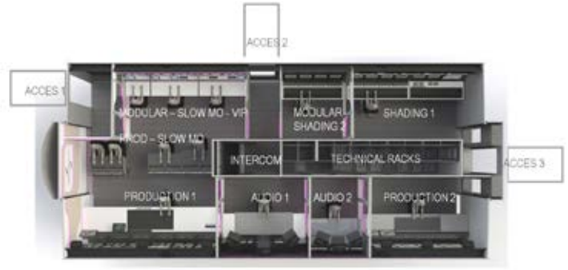
The Design of MS 12

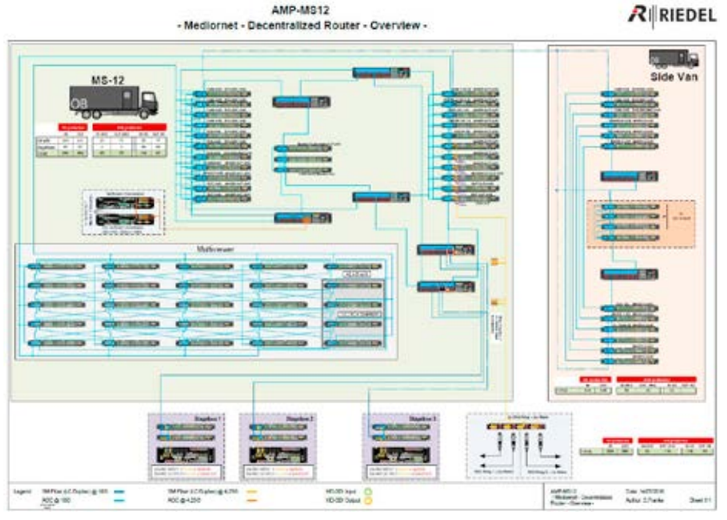
The MS 12 was designed in-house by AMP VISUAL TV. The coach building was carried out by Toutankamion. MS 12 can be considered as one of the most spacious OB trucks in Europe, if not worldwide. The two side extensions cover its full length and have no interior walls or panels. Systems integration was done by Videlio-Media according to AMP VISUAL TV's specifications. Every detail from lighting to the modularity of the workspaces was carefully considered.

The technical Infrastructure of MS 12

AMP VISUAL TV has built its groundbreaking MS 12 HD/4K-capable OBVan on a Riedel MediorNet real-time media network of unprecedented scale. Due to its modular design and mobile partition system, MS 12 can turn into a two-in-one OB truck capable of conducting joint operations with two production areas, two audio mixers, two vision rooms, and up to 42 modular workspaces.







The Riedel Mediornet Backbone

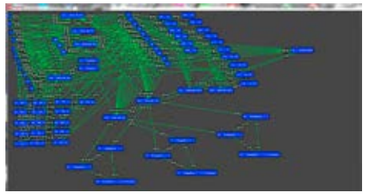
AMP VISUAL TV's sophisticated approach completely relies on a robust MediorNet infrastructure — one of Riedel's biggest so far — that offers essential benefits by replacing the traditional router, providing video, audio, data, and intercom transport and delivering routing and processing capabilities. Deployed in a fully redundant configuration built on a 10 Gb/s fiber network, 68 MicroN high-density signal interfaces, eight MetroN core routers, three MediorNet Compact Pros, and two MediorNet Modular frames are combined to serve as a decentralized matrix that transforms the MS12 into an unique OB van concept, with router elements situated in the ideal physical location for any given workflow or production.

"The MediorNet MicroN gives us much greater freedom in building sophisticated media infrastructures, from signal transport to full video router functionality and signal processing," said François Valadoux, Chief Technology Officer at AMP VISUAL TV. "With major events approaching, we need a 100 percent reliable and flexible system that will remain future-proof as the market migrates toward a fully IP-based environment. Given the ambitious goal for our pioneering MS12 12 OB van, and especially the ability to address 4K productions, I have to admit that the system is impressive, and we are very proud of the result. Our 4K-ready Riedel systems are ready for every big event."

Part of Riedel's MediorNet line of real-time media transport and management solutions, the MicroN devices give AMP VISUAL TV a high degree of flexibility in addressing the current and future demands of video production. With on-board signal-processing capabilities including frame synchronization, embedding/de-embedding, and delays, the MicroN-based solution handles SDI signals in a tremendously versatile and highly scalable routing solution, making it perfect for system architectures of any size. This modular approach introduces distributed system intelligence, with MicroN systems strategically located close to signal sources and destinations, and makes it easy for AMP VISUAL TV to tailor signal routing to the demands of individual productions, whether large or small.

François Valadoux
Chief Technology Officer at AMP VISUAL TV

Working seamlessly with the MediorNet MetroN core fiber router, which provides the backbone capacity in this system architecture, MicroN features a complete array of audio, video, and data inputs and outputs, including 12 SD/HD/3G-SDI inputs and outputs, two MADI optical digital audio ports, a Gigabit Ethernet port, two sync reference I/Os, and eight 10Gb MediorNet high-speed links. MediorNet Compact Pro frames provide AMP VISUAL TV with additional signal interfaces for their stage boxes, while MediorNet Modular frames support enhanced signal processing, including up-, down-, and cross-conversion. Fiber-based interconnections allow for less cabling within the truck, in turn saving space and reducing the weight of integrated systems.



The Modular Design

MS 12 is intended primarily for televised events requiring a very large number of cameras, or for two simultaneous productions, such as international broadcasts with its dirty or second screen feed. MS 12 relies on complete nodal, fully secure facilities with a record number of 12 technical bays. Its 2 extensions run the full length of the trailer increasing the width from 2.5 meters to 6.1 meters. MS 12: a concentrate of technology that will give tomorrow a new dimension to televised events!

From Le Mans to the UEFA EURO 2016

No fewer than 350 AMP VISUAL TV staff worked for almost a week on location at the Le Mans racing circuit with the MS 12 at the heart of the coverage. As soon as the race was over the MS 12 truck made its way to the Bordeaux stadium for a 4K production of one Euro 2016 quarter-final and a semi-final.

24h LE MANS 18-19 JUIN 2016

The 84th 24 Hours of Le Mans was an automobile endurance event held from 15 to 19 June 2016 at the Circuit de la Sarthe, Le Mans, France. Neel Jani of Porsche started from pole position for the second consecutive year, but heavy rainfall forced the organizers to start the race behind the safety car. Once the rain had stopped, the track sufficiently dried and the endurance cars were released from behind the safety car. Toyota, Audi, and Porsche traded off the race lead in the early hours until the No. 6 Toyota established a firm holds on first place, followed by the No. 5 Toyota and No. 2 Porsche. Issues for the No. 6 eventually allowed the No. 5 Toyota to take over the lead, maintaining a small gap from the Porsche. Kazuki Nakajima was driving the Toyota to the finish in the closing three minutes of the race when it suffered a mechanical issue and stopped on the circuit right after the finish line on his last lap. Jani overcame the one-minute gap to the ailing Toyota and passed it on the final lap, taking the race victory. It was Jani and co-driver Marc Lieb's first Le Mans win and Romain Dumas' second. The sister Toyota of Stéphane Sarrazin, Mike Conway, and Kamui Kobayashi finished three laps behind in second, while the No. 8 Audi of Loïc Duval, Lucas di Grassi, and Oliver Jarvis completed the race podium.

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THE PINNACLE OF 4K LENS QUALITY

FUJIFILM's award winning 4K HDR optical technology transforms live UHD productions around the globe

Fujifilm is at the forefront in the development of 4K UHD optical technology. Since the emergence of two-third inch (2/3") broadcast cameras and subsequent technology transformation which was initiated by the launch of Sony's 4K 2/3" HDC camera series, other camera manufactures soon followed this trend (Grass Valley, Panasonic, Ikegami and Hitachi etc.). We believe that it is safe to state that this is not just a trend, as was witnessed a few years back with the introduction of 3D broadcast technologies. The demand for 4K Ultra High Definition production acquisition, workflow and transmission technology has thus increased since the first live trail productions back in 2014 (FIFA World Cup). Since then we have seen a substantial surge in 4K UHD live productions, especially in the past twelve months, which to some extent can also be contributed to the increased proliferation of 4K UHD TV sets in private households and resulting demand for more 4K UHD content.

Major Projects in Europe:

In Europe "Timeline Television Ltd" was the first production company to acquire FUJINON's UA-Series lenses for their newt 4K UHD outside broadcast vehicle. Built by Timeline Television's System Integration division, the unit contains the latest UHD 4K technology including the World's first Sony 4300 2/3 inch UHD 4K cameras, Sony UHD 4K PWS-4400 server, the World's first FUJINON UHD 4K 2/3 inch UA80x9 (9-1440mm) EFP box and UA22x8 (8-352mm) ENG lenses, Snell Kahuna UHD 4K vision mixer and Sirius router, Axon signal processing equipment & Axon Cerebrum control system, EVS XT3 UHD 4K servers, Grass Valley Kaleido-Modular-X multi-viewers & Belden cabling. The new OB built had been built in conjunction with BT Sports who awarded a four-year contract for the provision of Ultra HD 4K OB's; providing content for the new BT Sport Ultra HD channel that went live back in August 2015. Since then "Timeline TV" has produced numerous live Sports events ranging from the UEFA Champions-League to World Hockey-Championships. The superior optical quality of the foresaid live productions could and can be viewed on BT-Sport's dedicated 4K UHD Channel which has been a success, increasing the numbers of subscribers month by month since it went on air..

Another major bench-mark project was the acquisition of the CTV Project (Vatican Television). The Vatican Television Center (CTV) was created in 1983. In November 1996 it was officially recognized as an organization fully associated with the Holy See. The principal aim of CTV is to contribute to spreading the universal message of the Gospel by using television to document the Pope's pastoral ministry and the activities of the Apostolic See, the Pope's general audience and other celebrations combined with the Holy Father's abroad. On this special occasion the "Centro Televisivo Vaticano" (CTV) produced the "Extraordinary Jubilee of Mercy" a major event in the Catholic Church, which commenced with the "Feast of Immaculate Conception" and the opening of the "Holy Door" (porta sancta). The opening ceremony from the St. Peters Basilica was broadcasted live to a Global audience; the ceremony was covered by 4K UHD Fujinon UA-Series lenses (UA80x9 and UA22x8) in combination with Sony's HDC-4300 cameras.

Fujifilm realizes that the transition to new 4K UHD acquisition and transmission technology will demand substantial investments by broadcasters and production companies in the industry. Especially here in Europe where most European State TV broadcasters just recently completed the migration from SD to the HD format. At this juncture they are not willing or able to take the next step towards the future. In contrast; private productions companies are less inhibited and more progressive in regards to investments into new technologies that will provide a strategic advantage in their respective fields of business.

Fujifilm has thus forged alliances with "Rental Partners" in order to guarantee availability of the newest FUJINON (UA-Series) 4K UHD optical technology to those clients whom are currently in the assessment phase, or whom are not able to purchase new 4K UHD acquisition equipment at this point in time. One of Fujifilm's most prominent partners in Europe is UK based Company "ES Broadcast Ltd" which acquired a large quantity of FUJINON UA80x9 and UA22x8 UHD lenses in order to fill the gap for European clients that have a demand which they cannot fulfill due to limited funding for new equipment acquisitions. Would like to rent FUJINON 4K UHD lenses – Please contact: ***www.esbroadcast.com***

After the introduction of the UA80x9 & UA22x9 lens models, there was a popular demand for longer and wider focal ranges. In response to this demand Fujifilm's R & D developed the all new UA107x8.4 (8.4-1800mm) which at current has the world's longest 4K UHD focal length, it has been complimented by the all new UA13x4.5 (4.5-118mm) Ultra-wide angle lens and upgraded telephoto lens UA80x9 (10.8-864mm) with 1.2.Extender which does provide more flexibility when shooting under diverse lighting conditions.

About the UA-Series

The UA-Series lenses are compatible with 2/3-inch 4K cameras. The applied EBC coating (electron beam) and "floating focus systems" which control multiple lens groups according to the shooting distance, deliver high-resolution, high contrast with a high dynamic range in images thru the entire focal range, from close-up to infinity; enabling 4K HDR video production with a realistic visual sensation with premium picture quality.

About Fujifilm (Fujinon)

Fujifilm has been engaged in the development and production of Fujinon TV & Cine lenses for over 50 years, enabling exceptional content creation around the globe. As a three-time (3) recipient of the prestigious "Emmy Award" for outstanding technological developments, the "IF Design Award" and "Red Dot Design Award"- Fujinon broadcast & cine lenses have repeatedly set the benchmark in the evolution of optical technology.

Find out more: ***www.fujifilm.eu/eu/products/optical-devices***

FUJIFILM

FUJINON 4K ULTRA HD TELEVISION LENSES

Would like to rent FUJINON 4K UHD lenses
Please contact: ***www.esbroadcast.com***

ES BROADCAST HIRE

TIMELINE TV DELIVERS LIVE ULTRA HD EUROPA LEAGUE FINAL 2016 FOR BT SPORT

AXON
THE HEART OF BROADCAST

BT Sport

Axon 4K processing & control delivers at the heart of live production

Since BT Sport launched its Ultra HD service in August 2015, the broadcaster's custom-built Ultra HD vehicle has been at the heart of its game-changing live productions. Designed and built in close collaboration with OB production partner Timeline Television, the truck – the first of its kind in Europe - has helped BT Sport deliver a range of live sporting events as an immersive cinematic experience to viewers across the UK, from Barclay's Premiership football, Moto GP to more niche-interest sports such as international championship hockey and Speedway.

On 18 May 2016, the vehicle made its first live Ultra HD broadcast from mainland Europe, covering the highly anticipated UEFA Europa League final between Liverpool and two-time defending champions Seville from Basel Switzerland. In a fixture that saw the Spanish champions win 3-1 to become the first team to win the cup three times in a row, the match-day production was delivered with an innovative end-to-end Ultra HD workflow, featuring a number of pioneering technologies including a range of 4K signal processing, distribution and control tools from broadcast infrastructure specialist Axon. For the live production from St Jakob Park, the truck utilized 12 Sony HDC-4300 2/3-inch cameras fitted with Fujinon UHD 2/3-inch 80:1 and 22:1 ENG lenses. A SAM Kahuna vision mixer switched pictures whilst a Sirius handled routing. A Sony PWS-4400 server provided replays alongside EVS XT3 live production servers.

Embedding and line routing was intelligently managed by Axon's Synapse Production Tool Boxes (U4T100 & U4T140), with a GDR416 card providing 4K signal distribution in the Timeline vehicle. Developed by Axon in close cooperation with BT Sport, these tools ease the challenges of a 4-wire production setup by carrying Vanc and Hanc data such as time-code and embedded audio. The U4T140 also provides a Dolby© E encoder and decoder. Other Axon Synapse modules deployed in the truck include 4K up-converters and down- converters. All other Synapse video processing units supplied are capable of handling 3Gb/s signals. A number of these video-processing modules have been executed with fibre-enabled I/O-panels, allowing conversion from video to fibre without the need of additional equipment. To handle Dolby© requirements in the truck, Axon also supplied the Synapse DEE28, a multi-format Dolby stream decoder and Dolby E encoder with voice-over module.

At the heart of the Timeline OB production chain sits Cerebrum, Axon's customizable monitoring and control system. Live broadcasts benefit hugely from an 'always on' control and monitoring system that can deliver comprehensive system management in an easy and operator-friendly way. By linking together all the main broadcast equipment from the major manufacturers, Cerebrum's advanced functionality and broad range of features significantly simplify multi device control onto one easy-to-use interface. It supports a wide range of devices including routers, production switchers, servers, audio desks, camera control units, receiver decoders, multi-viewers and waveform monitors – using either SNMP (Simple Network Management Protocol) or third party protocols.

"We used Cerebrum to smoothly control all of the matrix, multi-viewers, tally, all of the glue and lots of other pieces in the production chain, all via 10-inch touch-screens," explained Dan McDonnell, Managing Director Timeline Television. "It's enabled us to do complicated routing with ease – just with a press of a button."

Having confidence in a reliable broadcast infrastructure to support live productions has enabled operators to focus on their creative output and produce premium content for BT Sport's subscribers. They have been able to hone their skills and develop techniques to enhance the viewing experience. And since Timeline's first season of broadcasting in Ultra HD, the team has certainly learnt a lot. For example, additional detail of 4K capture enables different techniques to be used in filming live sport such as shooting wider with less cuts to allow viewers at home to watch a game seamlessly as if they were actually at the stadium. McDonnell concludes, "Timeline, in partnership with BT Sport, have been pushing the limits of 4K since we launched our Ultra HD OB truck ten months ago. We have worked with the finest manufacturers in the industry to find the best solutions to bring this technology to life and we're delighted that the unit operated by our talented staff have enabled BT Sport viewers to experience these historical live football moments better than ever."
Following on from the UEFA Europa League Final, the Timeline vehicle has been busy on the road delivering Ultra HD coverage of other prestigious sporting events including The UEFA Champions League, Barclay's Premier League matches, Women's Super League, the FA Cup, Moto GP, the Community Shield. Most recently it has been deployed to cover the Hockey Champions Trophy from London's Lee Valley Hockey and Tennis Centre and later this summer the unit will be in action again at the 2016 Speedway World Cup race-off and final in Manchester.

With the market increasingly favourable to the 4K proposition and viewer demands for premium content delivered at the highest possible quality that in-home technology can display today, BT Sport and the Timeline team are set to continue driving live Ultra HD sports broadcast forward into the mainstream, with Axon infrastructure supporting them every step of the way.

Geert-Jan, Marketing Manager at Axon Digital Design

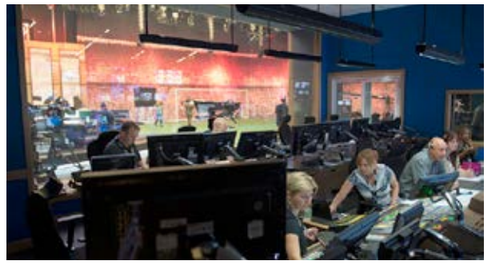
DRIVING BROADCAST INNOVATION: SAM AND TIMELINE TV DELIVER LIVE 4K SPORTS

Kahuna switcher and Sirius router serve as the UHD backbone for Timeline's game-changing UltraHD 4K mobile production truck

The Company:

Based in London, Timeline Television is a well-known name in UK broadcasting. For the past 10 years, the company has been spearheading broadcast solutions from concept to completion, including: outside broadcasts, post-production and studio-based productions. With two sizeable post production facilities in London and a third in MediaCityUK (Salford), Timeline works with many of the UK's broadcasters to deliver technical and creative facilities for programmes that vary in size and scope from live music and awards shows to political party conferences, global and domestic sports competitions, and current affairs.

As a leading broadcast supplier in the UK, Timeline needs to ensure its technology and services are at the forefront of developments in the industry. As such, in 2012 the company embarked upon an ambitious project with BT Sport to design and build the broadcaster's new high-tech production hub, in the Queen Elizabeth Olympic Park, within a tight timeframe.



"We only had six months to get BT Sport's new production hub off the ground, so we had to source the most proven and reliable technologies, from trusted vendors, to make sure we were not only completing the project on time, but working within BT Sport's budget while optimising their workflow in such a competitive market," said Jon Ward, Lead Engineer at Timeline Television.

Owing to this, Timeline needed reliable technologies that offered the greatest value for money. "When it came to a routing system, we evaluated several on the market and SAM's Sirius beat out the competition by far because of its ability to support hybrid audio processing, and 3G Video whist maintaining 100% redundancy in its architecture. We purchased three Sirius 850 routers for that project, which is what kick-started our relationship with SAM," he commented.

The Challenge:

Fast forward to 2015 when Timeline found itself embarking on another ambitious project in partnership with BT Sport. Leading the sport's broadcasting field, BT Sport took a quantum leap, choosing to launch a new dedicated UltraHD channel in August as well as adding 8 new HD channels. BT Sport commissioned Timeline to deliver over 65 UltraHD outside broadcasts in the first year. The challenge was to build a pioneering UHD 4K outside broadcast truck; with brand new and developing technology, in a very short time frame, that would be capable of delivering reliable quality broadcasts for many years. As a project goal, Timeline sought to work with vendors that could enable UltraHD OB productions to be made to the same high standards as current HD programs.

"In our opinion, there are only a handful of manufacturers that are experts in the underlying components of 4K transmissions. So choosing our vendor partners for this project was a highly selective process," said Quinn Cowper 4K/UHD Vision Supervisor at Timeline.

The Solution:

Drawing on SAM's rich heritage in live production, Timeline deployed SAM's Kahuna 9600 switcher with its modular control panel and Sirius 840 router as the truck's UHD backbone. With 4 fully 4K M/Es the powerful Kahuna 9600 offers a host of key features such as:

The freedom to combine mix/effect banks, keyers, and DVE effects to create any on-air style

Advanced workflow tools for quick turn-around times

FormatFusion™ technology that supports any combination of SD, HD, 1080p and 4K signals. This eliminates the need for external conversion, reducing capital outlay, removing any system timing issues and saving engineers time with setup.

Unique Make M/E™ technology that allows Timeline operators to select available switcher resources for a tailor-made M/E for specific requirements

Timeline is using the Kahuna switcher in a four M/E configuration and has maximized the level of input and output cards the switcher offers, resulting in up to 30 UHD 4K inputs (further expandable via the Sirius 840) and up to 16 UHD 4K outputs. To capture the live action, Kahuna handles signals from up to 16 Sony HDC-4300 UHD cameras (with Fujinon UHD lenses) and integrates with EVS servers and a Grass Valley Kaleido Modular-X Multiviewer.

SAM's modular switcher control panel for Kahuna gives Timeline operators the flexibility to create their own switcher panel, reconfiguring it to their specific needs and providing easy access features like custom thumbnails. Adding to the overall flexibility of this is the Sirius 840 router, which allows for any combination of signal formats and processing, without any limitations on timing or synchronization. It also doesn't compromise on redundancy, monitoring, or expansion capability.

The Results:

The 13-meter truck, UHD1, was constructed from the ground up with the highest quality UHD components available. With an end-to-end UHD workflow, the truck is considered one of the most advanced mobile production facilities in the world and represents a considerable leap forward in UHD technology to date.

"When working with such sophisticated technology, it's important to collaborate with manufacturers who truly understand the challenges of UltraHD 4K. Everything takes more time when you're broadcasting in UltraHD. The files are bigger, so moving and storing them is harder. Furthermore you need more cabling and more overall processing power than you're typically used to. So you want to build out your infrastructure in a way that makes things simple and easy for everyone.

"SAM was very forward thinking with Kahuna. It simultaneously supports every standard from SD to HD to UltraHD, which means we can convert signals from different broadcasters with ease. Kahuna handles UltraHD 4K right alongside HD, with the same ease and simplicity as working with just HD, so there's really no learning curve for our operators. It's also fully IP-enabled and we know IP is coming to live production. So when we're ready for IP, our truck will be ready too.
"Beyond that, SAM's ethos surrounding 4K is to deliver the most immersive viewing experience possible to customers, and that's the philosophy we wanted to adopt with this project with BT Sport," Cowper said.

BT Sport's UltraHD channel is the first of its kind in Europe and serves as a key indicator of how live sports is driving much of today's broadcast-production innovation. This isn't a new trend, Cowper said. "When the industry moved from SD to HD, it was live sports that really fostered that push. We're seeing the same thing now with UltraHD." As such, 4K is growing in importance for live sports because its rich, vivid imagery presents fans with a lifelike experience that more closely matches being at an actual game.
This was evidenced in January 2016 when BT Sport teamed up with the National Basketball Association (NBA) to broadcast a live NBA game in UltraHD for the first time. BT Sport enlisted Timeline's OB16 medium-sized truck, which contains a Kahuna 6400 switcher and Maverik control switcher. The truck managed the transmission of the UltraHD 4K signals with several cameras as the game was broadcast from London's O2 arena and delivered right to fans' living rooms on BT Sport Ultra HD.

A revolutionary moment in sports broadcasting, the game saw the Orlando Magic battle out the Toronto Raptors, and it went off without a hitch. Previously in January 2015, the NBA became the first U.S. professional sports league to

capture a game in UltraHD 4K, when the New York Knicks played the Milwaukee Bucks during NBA Global Games London 2015. But that broadcast was available to an invite-only list of NBA and BT Sport executives. The 2015 broadcast also used OB16 with an experimental installation of the 9600 Kauhuna. We were so impressed with the demo unit, that we never gave it back to SAM. We purchased it straight away and it was the first component acquired for UHD1.
Cowper said this year's NBA game was a huge achievement in sports broadcasting because it was the first time fans were able to watch a live NBA game in UltraHD. "They were getting a cinematic experience right in their living rooms.' he commented.

Looking ahead, Cowper said UltraHD 4K will undoubtedly get stronger and gain more traction, especially in live sports. "This is only the tip of the iceberg when it comes to UltraHD content, and that's why it's important for us to partner with vendors like SAM to help us underpin our commitment to this exciting and emerging standard. SAM takes great care in defining its market strategy, and the company has a strong product portfolio in place, evidenced by Kahuna, to leverage the technology shift the industry is seeing toward 4K," he said.

Timeline is very proud to be supporting BT Sport with their drive to deliver superb UltraHD sport programmes to viewers across the UK.

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BT Sport

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THE LATEST IN OUTSIDE BROADCAST DESIGN

NEP UK and Ireland, part of the global production services organization NEP Group, is transforming its fleet. Central to this is a fleet of four radically new large-scale trucks.

This new design follows the loss of some of the company's assets in a catastrophic fire at its main base at the beginning of November 2015. Imagine Communications was already engaged in discussions with NEP and so sped up its delivery to meet NEP's requirements.
Less than six months later, the first of four new trucks was commissioned and on the road. The other three are scheduled to follow at monthly intervals. Rob Newton, director of technology for NEP UK and Ireland, gave a guided tour of Pacific, the first of the new fleet, while it was part of the host broadcast operation for the Wimbledon tennis tournament in London.
"We have a total of four trucks on site, providing three sets of court coverage and presentation for the home broadcaster," Newton explained. "We also have various flypack areas in the broadcast centre providing galleries for six more courts and a second presentation service. And we have built two more studios and broadcast galleries for the American broadcasters covering the tournament."
Pacific's design is unusual, creating a unified and flexible working space. The trailer is double expanding, but unusually the larger part of the longitudinal expansion is outside the central body of the trailer. This creates an area with plenty of space: headroom in this part of the unit is more than three metres.

This design also allows the main equipment racks to be in the centre, fixed part. As well as improving the balance of the vehicle on the road, this minimises the stress on the key equipment and reduces flex on the interconnecting cables, providing additional resilience.
The design also creates a huge amount of working space – around 90 square metres –, which enables a large replay area to be incorporated as well as production control. Typically an outside broadcast company will deploy two vehicles to major sporting events: the production truck and a second, similarly sized trailer for servers and replay. The new NEP design means that for all but the most complex replay requirements everything can be done from one truck, which reduces cost for the broadcaster and time on site rigging and interconnecting.
The new NEP outside broadcast trailer design – the other three will be essentially identical to Pacific, with some small layout changes to suit specific client requirements – supports up to 30 cameras and 12 replay I/O devices. It is designed around a technical platform which will meet whatever the project needs. The truck is ready for 4k, and indeed has already done UHD productions.

Flexibility

Flexibility is key: as Newton pointed out the work comes from multiple clients and very different requirements. "It is not just about sport," he said. "The first 4k jobs we have done have not been sport at all, but theatre-based. We do everything from football to corporate to opera; 4k, 50p, 3D. Everything."

At the centre of the truck's technical design are two Imagine Communications Platinum IP3 routers, each in the larger 28RU frame, and giving a total switching capacity of around 1500 x 1000.

"We have been using the Platinum IP3 router for some time in our flypack kits, so it was a natural choice for us," Newton said. "It is a self-contained system with multiviewers built in, frame synchronisers, audio embedding and de-embedding,

and all the processing you are likely to need.

"That is particularly great for flypacks," he continued. "With a flypack, the more you can get in a box the better. There is less wiring, and less time to rig it on site. It makes it an out-of-the-box solution, rather than needing stacks of separate pieces of kit.

"Standardising on the Platinum IP3 makes it operationally convenient, too," Newton explained.

"We have about 15 vision engineers and 12 sound engineers on site, and rely heavily on freelancers. All our staff and key freelance pool had become familiar with the router and its software, which is a big thing. Having a familiar interface helps no end. It makes projects easier to crew and easier for them to understand. You open up the box and it is all there. It should all just work – and it does."

One of the design considerations was that, while each of the new trucks is completely self-contained, there will be occasions where two or more vehicles need to work together.

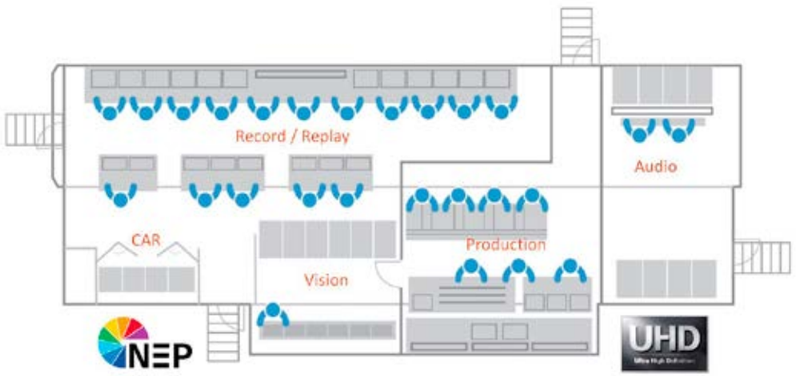
"That is another reason we went down the Platinum IP3 route," Newton explained. "We elected to fit some of the I/O slots with fibre SFPs, using CWDM. It means we can pick any pair of trucks and connect them with just two strands of fibre. That gives us about 200 three-gig signals shared between them. Sources available in one truck are now available in the other, transparently.

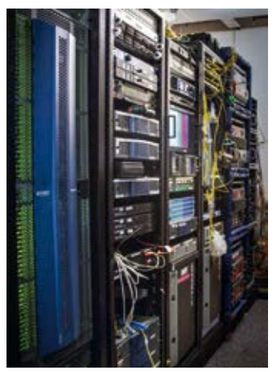
"In the old days that would be a lot of cabling; now it is two lengths of multicore fibre. That means there is practically no room for error and, because it is two cables rather than hundreds, virtually no rig time.

"And remember we can do all of this in 4k as well as HD," he added. "We have both 4k and HD running in the router at the same time, because much of the world is still HD and we have to provide two outputs."

Support

The Platinum IP3 router integrates signal distribution, audio multiplexing and de-multiplexing, flexible multiviewing and test and measurement, alongside precision routing, in a compact space. Its unique design allows digital audio and video to be switched alongside IP signals if required, although at present NEP has made the operational decision to stick with baseband signals. "We needed to design and build this new generation of trucks really quickly," Newton explained. "We felt that going down the IP route at this stage would have been more of a gamble for us.





The trucks also include a large amount of critical infrastructure equipment from Imagine Communications, including Selenio MCP units, particularly for up- and down-conversion between HD and UHD; and Selenio 6800+, Selenio X100 and Selenio X50 modular units for signal processing, monitoring and distribution.

That design philosophy extended out into the huge installation it had built for the tennis tournament. "It is a massive challenge for both equipment and human resources," according to Newton. "It might only seem like a two week event, but from our point of view we have been planning it for six months. Equipment has been acquired and wired for that length of time.

"All of our systems, in our trucks, our flypacks and our temporary installations, are based around the Platinum IP3, because of its flexibility," he continued. "I think we have a total of eight 28RU frames here, plus one of the smaller, newer, 15RU units. Alongside that we have probably 50 or more Imagine Communications test and measurement scopes, and vast quantities of glue: hundreds of DAs, embedders and so on.

"The reason we went down the Imagine Communications route is the Platinum IP3 itself," Newton asserted. "We have looked at other solutions, and we have looked at the other manufacturers. But the Imagine hardware is fantastic. Before the fire we were kitted up with IP3s in our flypack department, and we are convinced it is the way to go forward in our trucks.

"The relationship with Imagine Communications has been excellent. Whenever we have gone to Imagine to purchase new routers we have asked for new features to be added, parts of the software to be tweaked, and they have always been obliging. In an outside broadcast environment, every day is different. The Imagine Communications Platinum IP3 gives us the flexibility and functionality we need."

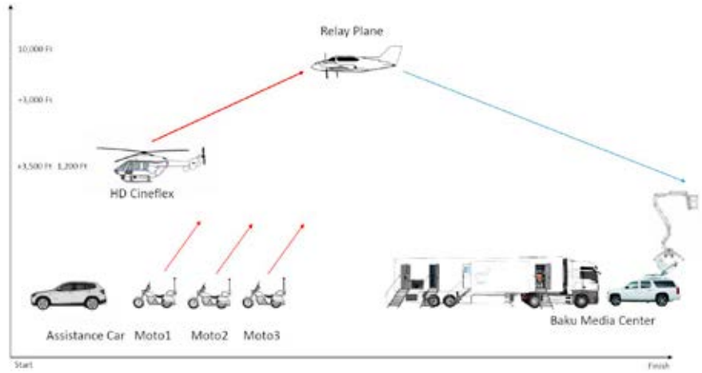
Imagine COMMUNICATIONS

NEP

LIVE PRODUCTION OF TOUR D'AZERBAIJAN BICYCLE RACE WITH THE SUPPORT OF BROADCAST SOLUTIONS

Tour d'Azerbaijan is an international bicycle race that takes place annually in Azerbaijan and is part of the UCI Europe Tour. For a couple of years German System Integrator Broadcast Solutions has been supporting the local broadcaster with technology and manpower. The major production vehicles used were a Streamline OB Van and a DSNG, delivered to host broadcaster Baku Media Center plus additional production support.

For a couple of years now Broadcast Solutions GmbH in Bingen has been offering production support to the local broadcaster Baku Media Center during the coverage of prominent bicycle race. The German system integrator and broadcast production company Baku Media Center look back to a year's long relationship. The development and delivery of a Streamline OB Van and a DSNG to Baku Media Center in 2014 marked the beginning of this cooperation. From the beginning part of the cooperation was not only the delivery of production tools but also the production support on-site during productions. Over the years this support encompasses manpower, consulting as well as training and the supply of additional production technology.



During the bicycle race Tour d'Azerbaidjan, Broadcast Solutions backs Baku Media Center with specialists, its know-how on the hardware side as well as on the production itself.

With this support, the local broadcaster was able to use the delivered OB Van and DSNG in the best possible way.

Broadcast Solutions supported the productions with teams of engineers, specialized on bicycle races, such as Tour de France or all bicycle sports during the Olympics. For live wireless areal video transmission, three additional motorcycles and an airplane were supplied. A specialized team covered the race via a helicopter with Cineflex camera system.

All motorcycles at the racetrack and the helicopter transmitted the video signals using RF uplink to the airplane. The airplane again covered the downlink of the signals to a receiving point at the finish line – a 30m crane. Then the signal was processed in the OB Van located at the finish.

A further task was to ensure the seamless integration of the RF signals into the production truck located at the finish line. This was done by integration of the RF equipment in the back of the HD truck. On-site Broadcast Solutions was responsible for the integration into the OB Van in terms of hardware and of a seamless workflow.

Besides all the equipment and production means provided by Broadcast Solutions, a further part of the commission was to train the teams on-site and to support the production during the event. With the support Broadcast Solutions offered to Baku Media Center the Azerbaijan company was even more able to realise the best production possible.

Broadcast Solutions for Your Success

Live broadcasting. On air in a few seconds. Everything needs to be just right: content, production, performance, timing – and above all the technical solutions. Technology designed to cope with every environment, climate and demands. Technology you can rely on a hundred percent.

This is where it all started. At present Broadcast Solutions is Europe's biggest OB Van manufacturer. As a hardware manufacturer and independent system integrator the company is transferring its experience in the broadcast industry to other demanding business areas. Broadcast Solutions is your competent partner for all technology in the fields of broadcasting, multimedia, infrastructure, engineering or consultancy – video, audio, IP, control systems, digital signage, IPTV, satellite communications and innovative coach building, to name just a few.

Broadcast Solutions offers German engineering to international standards thus giving our customers peace of mind when it comes to mission critical environments. Over the years the company successfully delivered over 300 outside broadcasting units in every conceivable variant, from small radio cars to 24-camera HD outside broadcasting vans. Furthermore Broadcast Solutions is planning, implementing and commissioning broadcast facilities, DSNG's, fixed up- and downlink stations as well as Satcom on the Move solutions.

Being a manufacturer independent system integrator Broadcast Solutions serves as a single source thus giving customers the freedom to choose the best technology available in the market. In close relationship with its customers Broadcast Solutions develops individual solutions – tailored to their specific needs and requirements.

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BAKU MEDIA CENTER

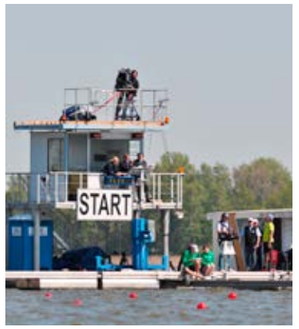
2016 EUROPEAN ROWING CHAMPIONSHIPS IN BRANDENBURG

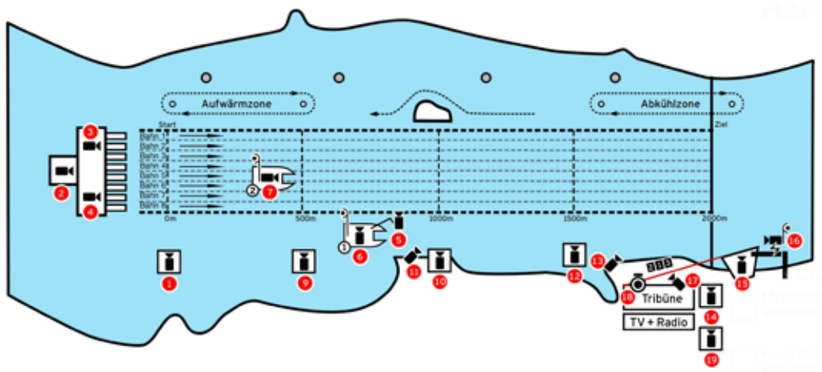
The 2016 European Rowing Championships took place in Brandenburg an der Havel, near Berlin (Germany) from the 6th to the 8th of May, 2016. A total of 17 different competition classes were held at the regatta course Beetzsee with all finals taking place on the 8th of May 2016.

Per competition class, one team from each of the International Rowing Federation's 46 European member associations was eligible; no qualification regattas were held. According to the entry list, the 34 national rowing associations registered 525 athletes. 63 % of the participants were male, 37 % were female.

The European Rowing Championships were held for the second time in Brandenburg an der Havel. Additionally, the city – also known as Brandenburg City – has already been the site of two World Rowing Junior Championships (1985 and 2005), a World Under 23 Championship (2008) and numerous international canoeing competitions. The German town was named host of the 2016 European Championship during the 2014 European Rowing Championships in Belgrade, Serbia. The European Championship was an important test before the Olympic regatta in Rio de Janeiro. The Championships began with over 500 athletes from 34 countries and ended with 23 nations earning medals. This is the widest medal spread ever at a European Rowing Championships, which was first founded in 1893.

The German host broadcaster Rundfunk Berlin-Brandenburg (rbb/ARD) produced an international and a national signal of the European Rowing Championships at the Beetzsee in Brandenburg. 12 countries took the world feed.





As host broadcaster, the rbb commissioned TV SKYLINE with the technical realization. The whole team, including editors and commentators, consisted of around 120 persons. For the event, TV Skyline opted for its Ü7, with its generous space and work places in the three control rooms fully utilized. TY SKYLINE itself secured support from HD-SKYCAM (Cineflex cameras) for the shot over as well as from PMT Professional Motion Technology (Rocketcam) and from rentEvent (Vislink wireless technology).

The technology

A main and sub control room as well as a multifunctional room were located inside the Ü7. 13 Ikegami HD cameras and a super slomo were used for the international signal, and additional four Ikegami HD cameras for the national signal. On the catamarans, three Cineflex V14 HD cameras were deployed – one of them on a dolly. For the spidercam, TV SKYLINE opted for PMT's Rocketcam (200m); for the beauty shots a SPORTS:CAM 5 HD was utilized.

The wireless technology was used for the catamaran cameras, the spidercam as well as the steadicam.

All races and award ceremonies were recorded with a total of 22 cameras. For the recording of material and the processing of the camera signals six EVS XT3 HDs (four for the international, two for the national signal), an IP director and an AVID editing mobile were deployed. TV SKYLINE's technical crew consisted of 42 persons.

A tight schedule was set for the week leading up to the races. From Monday to Thursday, the track inspection, the set-up and the cabling for all cameras were carried out. On Friday, May 6, the technical rehearsals and the first live transmissions were scheduled. The live production took place on Saturday and Sunday with the dismantling beginning straight after the end of the production.

The production conditions

The Beetzsee – a national park – proved to be a difficult production site as the lake's bank is in its natural state and thus difficult to access. As the use of a camera track on the bank was not possible, the International Rowing Federation's catamarans were equipped with Cineflex cameras and respective operator workplaces. Catamaran 1 was equipped with a Cineflex camera on board to pursue the leading boats as well as a further Cineflex camera on a GFM crane dolly for the remaining or the pursuing field respectively. Catamaran 2 followed the field and in particular captured emotional images of the competitors. Both catamarans used a fairway next to the racetrack.

The return to the track's starting point was strictly regulated so that the resulting waves would not interfere with the competitions. The boats were additionally equipped with ambient microphones from Audio Technica (BP4071) to additionally capture the driving noises as well as the competitors' groans and curses. To be able to smoothly transmit the competition noises, batteries instead of generators were used to supply the technology on the boats with power.

Vislink wireless equipment – provided by rentEvent – with an adequate reach ensured the video and audio transmission from the catamarans. The catamarans could only follow the boats until around 200 meters before the finish line, as the lake narrows at this point. Here, PMT's Rocketcam was deployed.

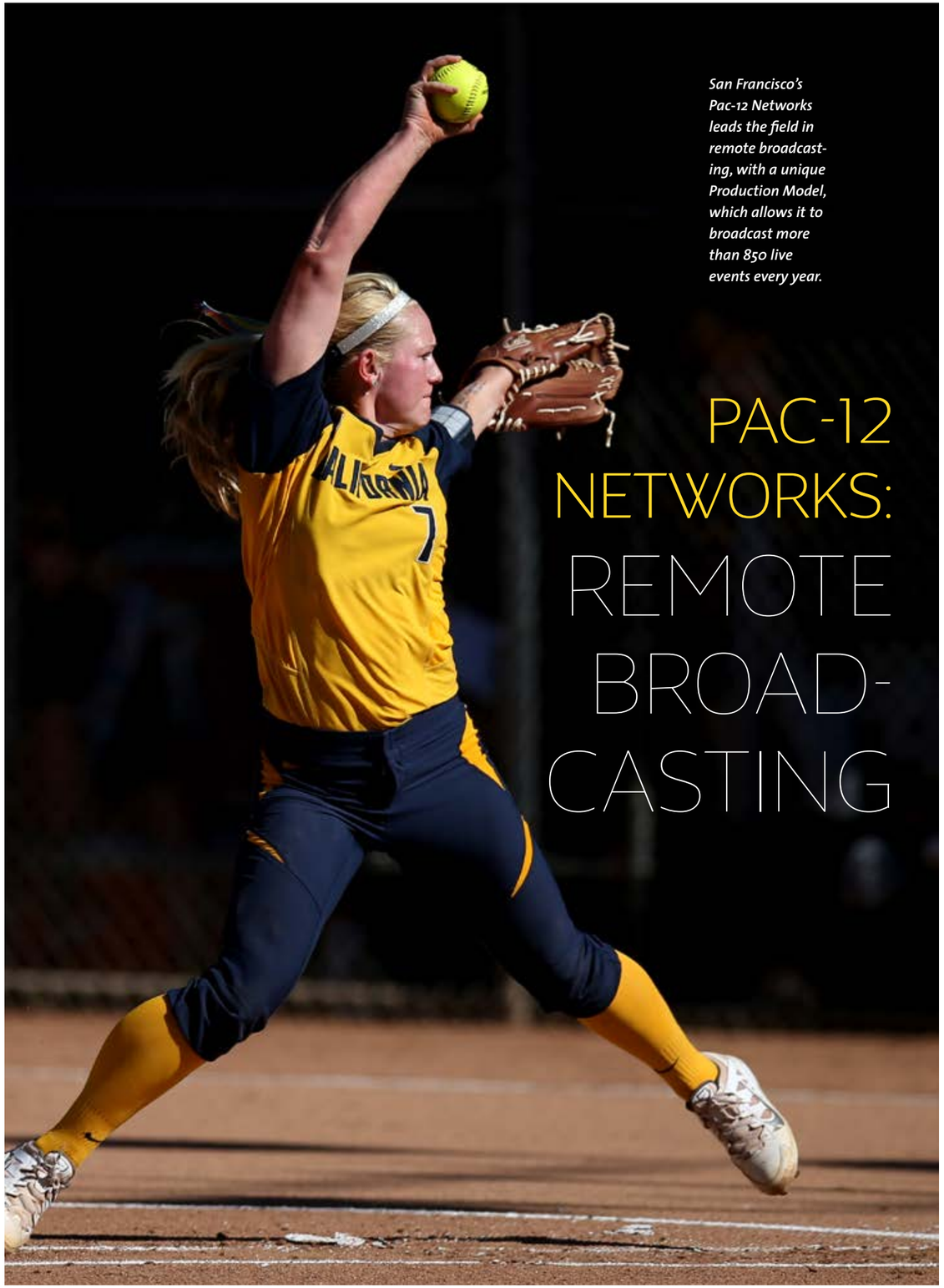
In any case, the whole sporting event was influenced by extreme weather conditions on all competition days. Due to storm forecasts on the afternoon of the final day, the races were moved forward by an hour at short notice. Consequently, all competitions took place in the morning and the last boat crossed the finish line in good time before the storm reached its peak.

Despite the adverse weather conditions, exciting competitions took place and the international field of athletes gave outstanding performances. In the end, the German teams had the best technique to handle the cross-head wind conditions. Under sunny skies, these finals gave an indication of what the 2016 season would hold. Some of the best European rowing nations tested their racing prowess for the first time this year and showed how good they might compete during the 2016 Olympic Games in Rio de Janeiro.

For TV Skyline, the European Rowing Championships was the second of three rowing events in 2016. Already from April 17-18, 2016, the company assumed responsibility for host production of the World Rowing Cup in Varese, Italy, utilizing 10 cameras including a super slow motion camera, two catamaran cameras and a crane.

A further highlight was the Summer Olympics in Rio de Janeiro (Aug 5-21, 2016), where TV-SKYLINE was responsible for the host production of the canoeing and rowing competitions. For the rowing competitions, nine production days are planned while for the canoeing competitions, seven production days are planned. Added to these will be time for assembly and dismantling as well as the rehearsals. For the event, TV-SKYLINE will rely on 23 cameras, two super slow motion cameras, two ultra slow motion cameras and seven EVS servers.
Rowing, which made its Olympic debut at the Paris 1900 Games, has more than a century of tradition in the waters of Rio de Janeiro. There will be eight men's and six women's events in boats for one, two, four or nine (including the coxswain) competitors. Rowing is much-loved for its stroke-by-stroke drama and nail-biting finishes, but in 2016 it was further enhanced by its venue – one of the most beautiful urban settings imaginable: Lagoa Rodrigo de Freitas in Rio de Janeiro, Brazil.

SKYLINE TELEVISION
rentEvent veranstaltungsproduktion gmbh
rbb FERNSEHEN
PMT
HD-SKYCAM DIE FILMFLIEGER



San Francisco's Pac-12 Networks leads the field in remote broadcasting, with a unique Production Model, which allows it to broadcast more than 850 live events every year.

PAC-12 NETWORKS: REMOTE BROADCASTING

Over the last four years, Pac-12 Networks has developed this model of broadcasting and is now inspiring others to do the same – in fact, its model is the inspiration to many of the industry's big-hitters, with the likes of ESPN, Sky Sports, Time Warner Cable and Fox Sports looking at Pac-12's infrastructure to help them become more efficient.

Meanwhile, their ambition continues to grow, both in terms of scope and technology.

Here, Pac-12 Networks' leaders talk about how necessity forced them to think about how to mix live sports in a different way, how to improve quality while reducing costs, and how that method is inspiring other broadcasters to look at their own systems.

Increasingly, broadcasters are looking at IP to provide them with greater efficiencies

IP, and AoIP, have become industry buzzwords, and the market is already crowded with different voices jostling for attention. Possibilities abound, with the promise of efficiencies across technology, personnel and content.

Pac-12 Networks in San Francisco is already way out in front. Since 2012, Pac-12 has been taking advantage of existing IP infrastructures, establishing an IP production model that has become an industry standard. It is changing the way live sports are being produced and allows for unmatched flexibility, efficiency and control, while enhancing production value across a staggering 850 live events this year alone.

The Pac-12 Conference is made up of 12 of the leading universities in the Western United States. These universities include the University of Arizona, Arizona State University, University of California Berkeley, University of California Los Angeles, University of Colorado Boulder, University of Oregon, Oregon State University, University of Southern California, Stanford University, University of Utah, University of Washington and Washington State University.

These member-institutions compete against each other across 23 college sports, and wholly own the Pac-12 Networks. In fact, Pac-12 Networks is the only broadcaster in the U.S. to be wholly owned by its members, which allows it to be flexible, innovative and quick to adapt. This is a responsibility Pac-12 takes very seriously.

Content

"In 2012 we were challenged to build a network capable of producing a huge amount of live remote sports productions," says Jonathan Leess, Executive Vice President, Operations. "We also have an obligation to our distributors and so in our first year we committed to cover 550 live events, 750 live events in year two, and 850 live events in year three, four and beyond".

"It was a daunting challenge, especially considering where we are based where the pool of engineers and mobile broadcast units on the West Coast are limited to support a college network of this magnitude. In addition to the professional sports televised on the west coast like the NFL, MLB, MLS and NHL, we added hundreds of live event productions of College Football, Basketball and many other Women's and Olympic sports events such as Softball, field hockey, water polo and lacrosse. We needed to find a way to produce as many as 12 events in one day from our 12 member universities, all at the same high standards and with dedicated television facilities and crews."

Pac-12's Senior Vice President of Production, Leon Schweir, picks up the story: "In our first year we had 23 events to cover in a single weekend, and it took us some time to get the network capable of televising all these. At that time we were using more OBs – for some time we were using 18 percent of all the HD trucks in the US. We needed a way to relieve this pressure, as well as keep costs down and maintain a consistent output."
This commitment meant Pac-12 Networks was forced to look at alternative production workflows. Its pioneering solution was a remote production workflow where audio and video is acquired at the sports venues and back-hauled to one of five studio control rooms in San Francisco where they are remotely mixed for broadcast. This reduces the number of onsite staff and minimises set up times. Pac-12 Networks' infrastructure provides coverage of smaller sporting events with, typically, up to four HD cameras, two SD cameras, 10 to 14 microphones and two commentator positions with minimal on-site truck facilities. Individual camera feeds and audio are sent back to the studios in San Francisco over IP where production and presentation is achieved.

Infrastructure

"We quickly discovered that all of our universities were already connected by an IP backbone for academic file transfers and admin, and we could leverage that network by adding direct connections to our studios in San Francisco," says Schweir. "Leveraging our universities' Internet 2 platform enabled Pac-12 Networks to create the largest private IP Network in the US dedicated to sports. It consists of more than 5,700 fiber miles and has a total network bandwidth of 40 GB per second.
"Pac-12 Networks was the first broadcaster to use IP for broadcast in this way, and by year two we were mixing 125 events remotely. This year, our fourth, we covered 850 events – 500 with full mobile units (with transport over IP), and 350 using our remote IP infrastructure - in other words, backhauling the content and mixing it locally in the studio."

"Utilizing our MI/O unit and a small sprinter van, we are able to connect the Pac-12 Studios in San Francisco to 97 of our on campus athletic venues and transmit video and audio bi-directionally as data. This essentially turns our San Francisco Studio into an onsite TV truck. There are no video circuits and no satellite uplinks – all connectivity is achieved via IP."
Back at the Studio, audio is picked up and mixed on one of five Calrec Audio consoles, but the remote production games are all on one of three Calrec Summas – again, Pac-12 Networks was ahead of the curve and were the first broadcaster to install the Summa in the United States. Their audio team worked alongside Calrec to ensure the Summa console met their exact requirements.

Pac-12 Networks got smarter still. Like many other broadcasters it maintains levels of redundancy on commercial fibre or satellite, but it also has layers across its IP platform.

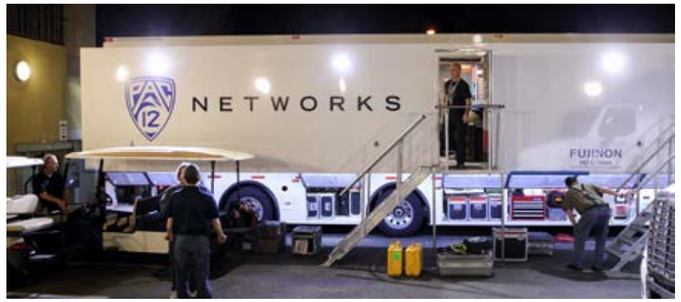
Transmission

The first problem Pac-12 Networks set out to solve was one of interconnectivity and transmission. With a robust IP infrastructure already in place, it needed a way to get everything onto it. Michael Harabin, Vice President, Technology, Engineering & Media Management, is responsible for assessing new and emerging business technologies for divisions at Pac-12 and is charged with developing technologies within the organisation. Following this work at Pac-12 Networks, Harabin and his team have become recognized as industry leaders in developing internet-based signal transportation for HD broadcasts, a centralized production model for live remote events.
"We first developed the Mobile In-Out (MI/O) unit for transmission. This 10u unit is sent out with the remote trucks, and we also have them stationed at all our on-campus athletic venues. This unit includes mic amps, DSP, embedding, encoding of IP streams and comms," he says.
"We have an equivalent set of hardware in the studio in San Francisco. These provide a wireless access point for the production team in the field directly to our network, as well as four digit extension dialling for our phone system. It has super low latency, it is stable and very low cost. A key feature is that DSP in the MI/O generates IFBs for local commentators, which negates any latency issues to and from the production centre in San Francisco when creating monitor mixes. This solves the latency problem which was experienced in the early trials at Big Ten Network, while operational latency for things like camera tallies is almost non-existent."

"Although our IP network is very stable, we still have options over IP," says Leess. "Our Master Control is in Denver, our studios are in San Francisco – this means we can route games either to Denver (where Master Control is located), or San Francisco (where the studios are). If we lose the network feed to the Studio we can re-route it to Denver where they integrate commercials uplink the fully produced games to our affiliates from there."

Chris Olson, Audio Engineer

Jonathan Leess
Executive Vice President



Quality

Pac-12 Networks' infrastructure is robust, flexible and very cost-effective, but the real benefits came later. Efficiencies in set-up time and staffing provided some unexpected bonuses, and while cost savings in this model are very apparent – average cost savings are between $12,000 and $15,000 per event - it's actually as much about quality and consistency as it is about cost saving.
It's as much about people as it is about technology.

Andrew Michaels
Production Manager

Mark Wolfson
Director

"This year we produced 500 events with full mobile units in the field, with full crews and announcers, and transmission for all of these were over IP through our transmission boxes," says Leess. "The other 350 events were using a multi-path MI/O with our smaller Sprinter vans, sending the video and audio streams to be mixed at HQ."
"Most of the crew for these broadcasts are in San Francisco; the crew includes a Producer, Director, Technical Director, an A1, a Chyron Graphics, Bug Box (score) and a replay operator. In the field we only need camera operators, audio support, utilities and announcers. All of the equipment we have at the studio supports that small team in the field, so we can produce a show with the same high standards as a large, multi-unit OB."
"This has allowed us to improve all our broadcasts," adds Schweir, who is responsible for overseeing all remote and studio production for Pac-12 Networks and ensuring a consistency of look and feel. "For example, it took us almost three years before all our American football games were in 5.1 surround. This is in part due to the availability of 5.1 capable trucks, but fundamentally it's about getting enough A1s who could mix in 5.1 surround! Such specialists are difficult to locate in some of our remote locations!
"Now we are mixing water polo, rugby, rowing and other niche sports in 5.1 surround via our remote production model because we have these skills available to us at all times in San Francisco. This model has allowed us to maintain the same high standards across the board, and it is extremely efficient. We can do all the FX here in real time, and as all the audio comes into the studio on Calrec's Hydra2 network, it's quick and easy to mix in 5.1.
"It allows us to provide the same crew for every event across a weekend; output is very consistent and it has allowed us to significantly enhance all our broadcasts."

Flexibility

"Ultimately, this system gives us flexibility and scope," says Harabin. "We have MI/O transmission facilities installed at all 12 universities, and we also produce events at other locations on the West Coast. As soon as our truck arrives at the venue they can connect to the MI/O unit and we are powered up and on the network..."
"In the future we can go two ways with this – we can go deeper into our production schedule and cover more events, or we could go wider and develop more services and production values which can ride on this system. A good example of this would be sharing additional content between the venue and the studio for social media content. The first time we did this was a watershed moment – engagement went up instantly, we can share things off the EVS which hasn't aired yet. It's important to keep pushing these boundaries to find new ways to promote the student-athletes, and the schools in order to do the best job we can."
"We set out to be innovative and we've set a tone internally to strive for better," adds Leess. "The visits we get from the major players, from broadcasters with much deeper pockets, are because they are looking at the same kind of production models to help them match the quality of their larger OB productions and achieve higher levels of efficiency. We're all looking to increase our content without sacrificing quality."

CALREC

GETTING MORE WITH LESS: POLE POSITION TV PRODUCTION

Live sport TV production is one of the most appreciated kind of TV shows and it is also a challange for every broadcaster. The increased TV channel offer demands that broadcasters produce more and more shows with less resources. In other words: produce more efficiently.

Without a doubt F1 Grand Prix can be ranked among the sports blockbusters. One of the aims of any producer is keeping the audience engaged and the "Wow" effect during the shows that take place before and after the race. With this aim in mind BLT went on to design the SportTouch system used by the talent-on-air. What is SportTouch? SportTouch is made of a BLT VideoServer with Control panel used by the Slomo operator and a BLT tablet-style control panel for the on-air-talent.

Through the tablet-style control panel, the on-air-talent is able to browse the material (all Clips created by the Slomo operator and also the raw live recorded material) during his live commentary. Using natural fingers gestures, like tap, pinch, spread and slide, the on-air-talent can play the material used for the sport technical commentary without any help as if he was using a smartphone.

The technology behind the system is a simulcasting between server playout and tablet browsing without any latency: what the on-air-talent plays and selects on the tablet-style control panel can be aired at full HDTV without delay through the video server playout channel. The network link between the Server and the Tablet is WiFi. In this way users may walk freely inside the event venue.

The SportTouch system is equipped with a digital Zoom and lens effects, that the on-air-talent can use to point-out race details to the audience or play simultaneously two clips to show, for instance, different angle views.

The SportTouch system unleashed new opportunities for the on-air-talent and at the same time the underlining technology relieves the slomo operator from the task of following the on-air-talent#s speech. The on-air-talent is free to change his speech on his own and use any suitable content that will be broadcast to the audience.

WOW that's innovation.

BLT italian emotion since 1999 | Rai Sport 1 | Formula 1

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IKEGAMI CAMERAS CHOSEN FOR AL KASS SPORTS CHANNEL LIVE PRODUCTION VEHICLE

Ikegami cameras have been chosen for the OB-10 live production vehicle recently completed for sports channel Al Kass in Qatar. The vehicle is believed to be the largest ever commissioned by a Middle East broadcaster. Dimensions including tractor unit are 16.5 meters length and 4 meters height. Width is 2.5 meters expanding to 4.1, fully self-supporting. Total weight is 37 tons. It is equipped with 31 cameras for operation by a 29-strong crew.

The new vehicle includes 28 Ikegami HDK-97A 16-bit full digital cameras plus 8 Hi-Motion II high-speed cameras. Also supplied were 3 WA-97 wireless adapters, 7 Ikegami FA-97 3G HDTV fibre adaptors, 25 TA-97 triax adaptors, 27 CCU-970M camera control units, 28 OCP-300 operation control panels. The camera equipment was ordered in two phases and has all now been delivered.
OB 10 was designed and constructed by Broadcast Solutions, one of Germany's leading broadcast system integrators. A key requirement specified by Al Kass was fast set-up time. OB-10 can be fully operational within 20 minutes of arrival at site.

The Hi-Motion Camera System

An evolution of the EMMY Award winning Hi-Motion camera system, the Hi-Motion II is designed to deliver instant ultra-slow motion imagery of fast-action broadcast sports events. It has been used at a very wide range of events including coverage of international athletics, motor racing, equestrian and aquatic sports as well as at major-league ball games.
Features include a 1920 x 1080 pixel high-definition three-chip CMOS sensor block plus the ability to set the recording speed between normal and 10 times faster than real time. The Hi-Motion II can be integrated easily with an EVS slow motion replay server and also provides continuous live video output. Flicker correction is included to reduce the effect of lighting flicker on ultra-high speed images.

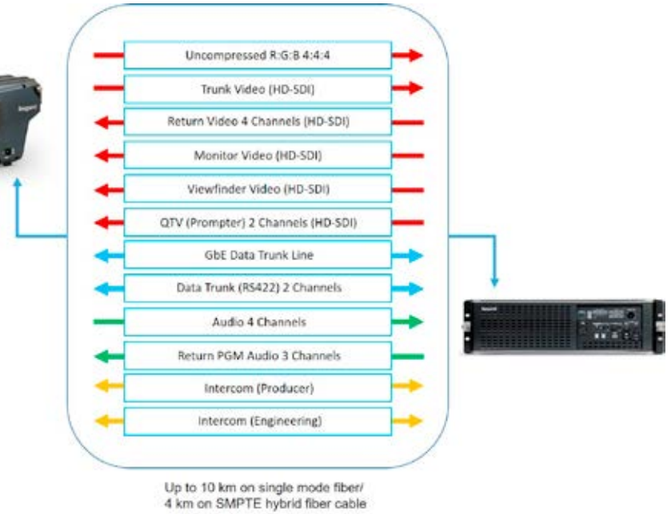
CONTENTS

The HDK-97A Camera

The HDK-97A employs three 2/3-inch AIT CCD imagers and an advanced digital video processing system provided high picture detail and accurate rendition of colour gradations. Delivering a choice of 1080/50p 4:2:2 or 1080/50i 4:4:4 colour sampling, it is designed for traditional-style multi-camera production applications. A docking-style camera, the HDK-97A also features a 3G fibre-transmission system from the camera head to its CCU. Transmission options include an HD-SDI QTV signal for prompter use and an HD-SDI trunk channel that allows connection of a second source such as a POV camera.

The UHK-430 4K Portable Broadcast Camera

4K resolution and high dynamic range have become important issues throughout the broadcast media industry as content producers and delivery channels plan their investment strategy for the coming five to 10 years. The first in Ikegami's new-generation UNICAM XE range of cameras, the UHK-430 incorporates three newly-developed 4K-native 2/3 inch 8 megapixel CMOS sensors which provide full 3840 x 2160 ultra-high definition resolution plus the depth of field required for studio and outdoor production. The UHK-430 delivers four times more image detail than high definition and has a color depth of 10 bits per pixel instead of the current limit of 8 bits per pixel. The UHK-430 incorporates a B4 bayonet mount compatible with 2/3 inch HD lenses. An optional SE-U430 expander accommodates large studio or OB lenses. Two piece construction allows the sensor and lens head to be detached as a compact unit for easy deployment on a support devices such as long-reach manually-controlled camera poles. In this mode, the head can be operated up to 50 metres from the camera body.



Up to 10 km on single mode fiber/
4 km on SMPTE hybrid fiber cable

At the heart of the UHK-430 is a new processor, the AXII, reducing power consumption and delivering a wide range of features including 16-axis color correction and new focus-assist for 4K and HD video modes. The AXII also provides the processing for Ikegami's newly developed i-Log transfer characteristic which delivers high contrast for a wider dynamic range.
This allows more image information to be retained for greater headroom and color grading. The ITU-R BT.2020 extended color space specification is supported in 4K mode. BT. 709 color space is supported in both 4K and HD modes.

VFE-741D
7" OLED Viewfinder

Ikegami viewfinders available for the UHK-430 include the 7.4-inch OLED VFE741D, the 7-inch full HD resolution LCD VFL701D LCD and the 2-inch portable LCD VFL201D. All three include a serial digital interface for integrated camera and viewfinder menu control.
The companion Ikegami CCU-430 camera control unit enables easy migration from HD to 4K live production. Features include switchable 4x 3G-SDI 4K output as well as HD output. An optional plug-in board makes 4K video, HD video, and HD cutout from 4K available simultaneously. 12G-SDI and video-over-IP interfaces will be introduced in the coming months.
A built-in 40 gigabits per second optical transceiver delivers full bandwidth 4K RGB 4:4:4 component channels from camera to CCU, allowing very high quality chroma keying.
Dual HD outputs are provided for teleprompt and talent monitor plus return video lines from studio to viewfinder. The UHK-430 also has a Gigabit Ethernet data port to allow networked control.

Ikegami ALKASS broadcast SOLUTIONS

AMPING UP SWEDISH TROTTING: STATE-OF-THE-ART TRACKING AND ON-SCREEN GRAPHICS TECHNOLOGIES ENHANCE RACE BROADCASTS AND BETTING INTELLIGENCE

by Per Tellander

The sport of harness racing, also known as trotting, is tremendously popular in Sweden. Reflecting just how much our citizens love watching and betting on trotting races, there are 33 tracks throughout the country devoted exclusively to the sport – and they collectively host almost 1,000 race events every year.

The tracks are owned by separate non-profit organizations whose purpose is to conduct races and promote interest in trotting and breeding in their respective region. The Nordic countries even have their own breed of trotting horse known as the Nordic standard, horses that are bred for cold-weather racing in northern Sweden and compete in their own class.

In 1974, the ATG (the Swedish Horse Racing Totalisator Board) was created to ensure the long-term financial stability of trotting and thoroughbred racing. Under contract by the Swedish government, the Swedish Trotting Association, and the Swedish Jockey Club, ATG oversees and administers all betting activity and operates 2,000 betting agencies throughout the country. Nearly 100 of these are "ATG Live" betting shops where customers can place bets and follow races live on television.

As the broadcast arm of the ATG, Kanal 75 produces more than 100 hours of TV every week including all racing broadcasts for the "ATG Live" shops as well as Sweden's TV4 network. We're on the air 365 days a year from early morning to late evening, and our broadcasts are also streamed to the Internet at www.ATG.se. Through those channels we attract betters not just from Sweden but from Australia, South Africa, the U.S., and about 20 European countries.

Kanal 75 is an important link in ATG's stated objective to "apply an innovative and responsible approach to make betting on horse racing exciting, entertaining and accessible." To that end, last year we launched an ambitious project to add leading-edge tracking, analysis, and virtual graphics technologies to every ATG race track. In this article, we'll describe that project in detail – including the requirements, deployed tools, and results.

Blazing a Technology Trail for Trotting

If you love to watch sports on television, it's a safe bet that your viewing experience has been enhanced by some sort of player tracking technology. Sports broadcasters all over the world are adopting tools known as electronic player tracking systems (EPTS) as the technology grows more sophisticated and offers new levels of automation and accuracy. Broadcasters can use EPTS data to tell a better story through graphically enhanced replays or even fully virtual replays in which animations recreate player movements. The data can feed across a wide range of visualization platforms, including 3D, interactive, and mobile, to help explain how a match unfolded. On-air pundits and expert analysts can better explain the dynamics of how games have been won or lost, and to empirically support their hunches.

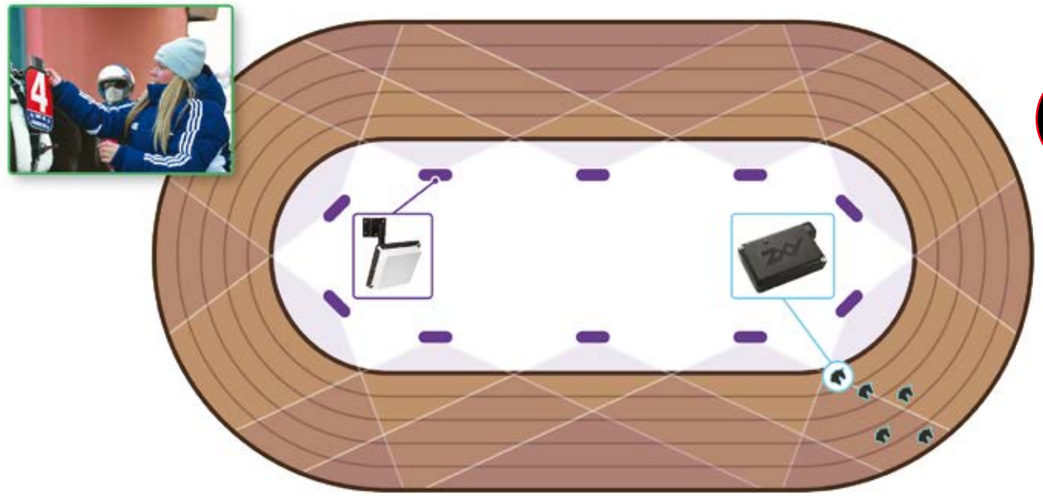
EPTS technology has had an impact on virtually every type of team sport, but until we came along it had only seen limited application for horse racing. At Kanal 75, we wanted to be able to add the kind of graphic detail and analysis that our viewers had come to expect from other modern sports broadcasts. We knew this would require an EPTS solution that could track each horse and mark its position during a race with very high accuracy. We also needed technology that could easily translate from team sports to the world of thoroughbred racing, and clean integration with virtual graphics tools for presenting the EPTS data in harmony with the action on the screen.

After exploring EPTS options, we decided a transponder-based radio-frequency (RF) solution would do the best job of meeting Kanal 75's requirements. With core technology adapted from highly advanced military communications applications, this type of system uses RF transmissions to very accurately determine the position of transponders worn by athletes engaged in a sport; in our case, the horses.

Settling on a Solution

Based on an exhaustive evaluation of the market for RF-based EPTS solutions, we chose ChyronHego's ZXY in tandem with the company's Virtual Placement virtual graphics creation and placement tool and GS2 real-time, 3D graphics creation platform. Not only is ChyronHego a global leader in broadcast graphics creation, playout, and real-time data visualization systems, but it's the only vendor that could offer a complete and integrated solution from highly accurate data gathering all the way to ready-to-use output services for sophisticated and engaging television graphics.

ZXY is known in the industry for its market-leading accuracy of +/- 20 cm, delivered by highly sophisticated RF tracking technology that has been field-tested by leading sports clubs around the world to study athlete performance in both training and actual match scenarios. The ZXY solution consists of lightweight transponders that include a highly sensitive and integrated internal measurement unit (IMU), as well as Bluetooth communication. The single-chip IMU contains an accelerometer, gyroscope, and magnetometer that offer additional metrics for measuring physical performance of the athlete, and the built-in Bluetooth chip enables other Bluetooth-enabled sensors and devices on the horse or sulky (cart) to communicate data throughout the ZXY ecosystem. Data can be visualized live on laptops or tablets through the ZXY monitoring software, which offers a range of dynamic and easily customized graph tools.



An Industry First

With this summer's completion of phase one of the Kanal 75 EPTS project, installation of ZXY at 17 Swedish Trotting Federation tracks, we'll mark an exciting milestone – the first application of ChyronHego's ZXY technology outside of football and the largest of its kind in the world of horse racing.

Throughout each race, a small ZXY transponder on each horse tracks its exact X, Y, and Z coordinates 30 times a second. In this manner, the system collects a large quantity of highly accurate data, such as the horse's actual path around the track, its speed and efficiency when running the course, the distance from one horse to another, the horse's acceleration, and more. In addition, ZXY applies behavioral algorithms that can predict factors such as the moment when a horse is about to go into a gallop, a gait that is prohibited in harness racing.

To enhance race broadcasts, we use the Virtual Placement GS2 graphics systems to translate the ZXY data into virtual graphics that are in harmony with the action on the screen, such as live marking horses within the broadcast; tracing a particular horse's path around the track; or displaying names, times, positions, statistics, and sponsor logos. These on-screen graphics bring ZXY's analysis to life for Kanal 75 viewers, creating a better and more exciting media product that supplies critical data for more informed and strategic betting. The graphics are also used to enhance various second-screen applications and Kanal 75's online streaming of races.

At Kanal 75, we're now able to add analysis and give graphic details that viewers expect from any modern sports broadcast, and we can enhance our second-screen experiences as well. EPTS solution has enabled us to reach not only our "hardcore fans" but also to expand our base of potential new customers over time. The TV graphics and onsite graphics enhance the experience for the viewers/spectators by providing graphics and brand new types of statistics. Furthermore, with new digital solutions the data (and graphics) open up the doors for completely and never-seen-before apps which also enhance their possibilities to reach new - and younger - audience.

Although the initial objective of the project is to enhance our viewers' experience of harness racing, we're saving the collected ZXY data and accompanying virtual graphics. In a future phase, this information will be supplied to breeders, racing teams, and drivers to help them improve racing performance, just as coaches and players in many other sports do today.

Taking Trotting to New Levels

In Sweden, horses and horse racing are at the center of an entertainment industry that employs thousands of people around the country. ATG is committed to making a significant contribution to this key economic driver by offering racing fans the best-possible betting experience and using the profits generated by betting activities to the betterment of equine sport in Sweden. With the new ChyronHego tracking, analysis, and virtual graphics installations at the trotting tracks, ATG and Kanal 75 have taken a large step forward in meeting these goals.

The Kanal 75 ZXY project demonstrates how today's most innovative tracking, analysis, and graphics technologies can be applied to enhance intelligence and enjoyment of any sport. The ChyronHego sports tracking solutions have long provided football clubs with valuable tactical intelligence on players, teams, and officials. Now these technologies are being applied to take Sweden's trotting and thoroughbred racing to new levels of entertainment and informed decision-making for the betting community.

Per Tellander
CEO of Kanal 75

CHYRONHEGO

KANAL 75

GOLF CHANNEL

(W)HOLE IN ONE WITH KVM FROM G&D

Customer

Golf Channel is an American cable and satellite television network and multimedia company that is a part of the NBC Sports Group division of NBCUniversal. Exclusive partnerships with the world's top tours allow Golf Channel to feature more live golf coverage than all networks combined, as well as a programming schedule distinguished by golf's highest-quality news, instruction and original content. Co-founded by Arnold Palmer in 1995, Golf Channel's headquarters and studios are based in Orlando, Fla. Golf Channel is available in more than 200 million homes in 84 countries in 13 languages around the world through cable, satellite and wireless transmissions.

Challenges
Expanding IT environment
Separation of equipment and personnel

Products:
KVM matrix & peripherals:
2x ControlCenter-Digital 288,
DP HR-DH CPU & CON modules,
DVI-CON & DVI-CPU, VGA-CPU-UC

KVM extenders:
DVI-Vision-CAT-AR (CPU & CON)

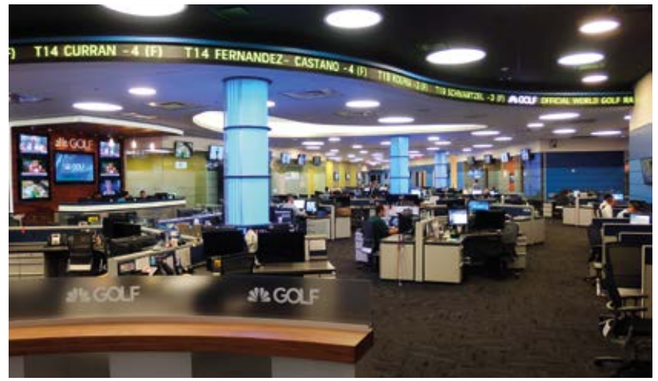
KVM accessoires:
Multipower12 & Device Carrier

Features:
KVM Matrix-Grid™ function,
Push-Get function,
TradeSwitch function

Result and benefits

Removing computers from workplaces for better working conditions
Central system storage in dedicated server rooms
Access to multiple platforms via the work places
Easy operation of multiple systems at a time with CrossDisplay-Switching

A long time ago, probably within the 14th or 15th century, the first documented, modern Golf matches took place in Scotland. What started as a simple game has changed into a more and more professional sport within the last decades. Nowadays, golf is increasingly popular around the world. Therefore, tournaments and competitions are interesting for a huge number of golf enthusiasts and fans around the globe.



With an audience in 84 countries in 13 languages around the world, NBC's subsidiary is one of the most successful channels within this international market. Founded 20 years ago as the first 24-hour network devoted to a single sport, the channel has experienced tremendous growth from its initial launch to become a well-established, international channel. Broadcasting from major live events and tournaments around the world, exclusive interviews with popular players, daily shows that bring the latest news from the golf community to the fans, and country specific content produced by the Golf Channel is what the broadcaster delivers to its audience. To produce and to deliver this program to the recipients around the world, the channel needs the women and men in front of the camera, the colleagues that prepare the content and that do the research about relevant and interesting themes and also the ones that edit the content and develop the program schedule. To succeed within a competitive media market, the Golf Channel team has to deliver the latest top stories about and from the scene and up-to-date content that is unique within the world of golf broadcasting.

However, all this would not be possible without the team working behind the scenes and with the technology this team is using for the different tasks. As an NBC affiliate, the Golf Channel is using high-end equipment and systems from well renowned companies which provide systems and solutions for the broadcasting industry.
G&D is therefore proud that the Golf Channel selected the ControlCenter-Digital matrix system and that the channel trusts into G&D´s 30 year long history and experience as manufacturer of mission critical KVM systems.
Meanwhile, the KVM matrix system has become a major backbone of the channel's studio infrastructure in Orlando/Florida. Around 200 computers and 50 operators which keep the Golf Channel Studios running 24 hours a day and 365 days per year are connected to the G&D systems. Currently the Golf Channel is operating two ControlCenter-Digital and each system does provide 288 Dynamic Ports (CCD288). The flexible port configuration and the system range enabled the Golf Channel engineers to implement the KVM system easily into their existing infrastructure.

Since the CCD288 requires only nine rack units both systems are installed together into a single rack. Saving rack space was critical for the Golf Channel since the expanding station needs any free rack space for its further IT expansion.
Another important feature is the modularity of the CCD system, e.g. that the switch card and the control card can be exchanged quickly and replaced with cold stand by cards in case a system failure might occur. With this option the Golf Channel is prepared even for a major system problem that has to be solved within minutes.
The operators are located within different locations such as Engineering, (Post-) Production and Editing.

"The G&D system has been in operation since late 2014 and so far we have had no issues with the system or its components. It's running very stable and reliable. We indeed trust in G&D's technology. The operation and configuration is very simple. Our experienced team figured out easily how to work with the system and how to configure it."
- Brian Slusarz, Director Engineering

G&D´s "DVI-CON" operator units allow access without any latency and instant switching to the different server systems which are connected to the matrix. Since the modules do not require cooling by fan, the noise within the different studios is reduced to a minimum what delivers a quiet working environment for production, editing and engineering. As the matrix does allow an individual configuration of operator workplaces and individual user rights management, the system administrators can manage and control the complete (KVM) infrastructure from their engineering room or from any of the DVI-CONs installed within the different operator work places.

"A big feature of the G&D system is its simplicity – we actually did not need any help from G&D during the installation phase. What our team likes is the userfriendly web-interface, the low latency, the picture quality and the option to work on several operator modules with a single keyboard and mouse. Besides this, we often use the On Screen Display that allows to switch instantly between different sources."
- Andre Veenhuis, Engineering

Another useful feature is G&D´s monitoring function since the administrators have to monitor and to maintain around 200 computers and 50 operator workplaces. Within the server room the Golf Channel decided to use a mix of G&D´s Device Carriers, MultiPower12 units for central power supply and individual power units within certain racks, depending on the available space within those. The range of up to 140 m (310 ft) from the CPU modules to the matrix and from the matrix to the CON modules via CAT-x made the installation simple for the technicians – they had not to worry about the system range. For its editing workplaces, the Golf Channel is using the brand new G&D DP-HR-DH modules. These modules transmit keyboard, mouse and 2 x video via one single CAT-x cable. Before using the DH modules, the channel was working with simple point-to-point extender systems which don't allow as much flexibility as the matrix solution. Since the integration into the KVM network the administrators can access all editing servers via the matrix system from the central engineering room and from all operator consoles if necessary. The operators working within different locations can switch between the available servers (the web interfaces allows the administrators to create user groups or individual users with certain user rights).

Components used within the Golf Channel KVM installation:

CCD288 frame
I/O Cards for CAT and fiber (mixed operation); each card does have 16 x Dynamic Ports for individual configuration
DVI-CON and DP-HR-DH operator modules (for the transmission of keyboard, mouse and 2 x video via 1 x CAT-x cable)
DVI-CPU, VGA-CPU-UC and DP HR-DH modules
Device Carriers for 2, 3 or 12 G&D CPU modules
MultiPower12 for central power supply of G&D CPU modules
TradeSwitch function (allows easy and user friendly switching by mouse)
Push-Get function (operators can distribute their screen content to other operators or receive screen content)
KVM Matrix-Grid™ function

With the CCD systems and its components the Golf Channel can expand the KVM infrastructure within the next years and G&D´s KVM Matrix-Grid™ function will help to add different matrix systems within different locations so the installation can turn into a big, virtual matrix system that is reliable, flexible and expandable.

General Contact

GOLF CHANNEL
7580 Golf Channel Drive
Orlando, FL 32819, USA
Phone 407-355-4653
www.golfchannel.com

G&D North America Inc.
7900 Oak Lane, Suite 400
Miami Lakes, Fl. 33016, USA
Phone +1-786-456-5115
www.gd-northamerica.com
sales@gd-northamerica.com

CLEAR-COM SECURES INTERCOM FOR FORMULA E

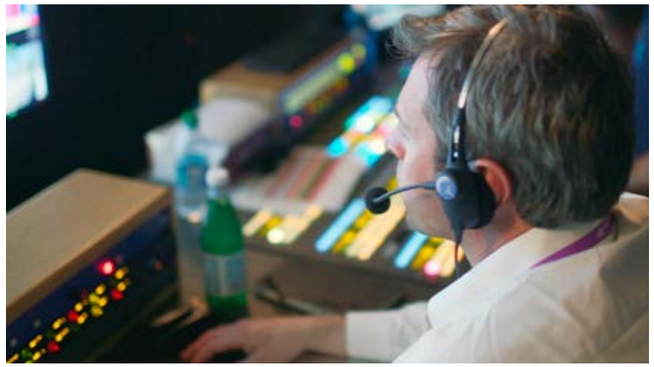
Petrol heads may still see it as sacrilege, but after two successful seasons Formula E, the racing championship for electric cars, has proved popular and is making people look at motor sports in a different way. New technology is also playing a major role behind the scenes, providing the vital communications link not only between the team engineers and their drivers but also allowing televisions viewers to hear the instructions being given and enabling commentators to interact with the racers.

This greater interactivity comes through IP-based intercoms developed and manufactured by Clear-Com and supplied by specialist comms company MRTC. During the 2015-16 season of what is formally known as the FIA (Fédération Internationale de l'Automobile) Formula E Championship, which had its finale at Battersea Park in London on 2 and 3 July 2016, MRTC installed Clear-Com systems into 58 of the 60 cars taking part.

MRTC (Midlands Radio Telephone Centre) was founded in 1979, initially supplying comms equipment for rallying. From there the company began working on the Le Mans 24-hour race, the most recent staging of which was during June, and then Formula 1 Grand Prix. Communications have become an important part of all motor sports, enabling the team bosses and engineers to talk to the drivers, giving them instructions and information about how the car is handling and what is going on in the race.

Because of the immediacy of this situation, says MRTC director Ken Rumbold, any intercom system has to provide stable links all the time, as there is no room for error. "On the broadcasting side, with intercoms between the trucks, camera operators and the production team, there are options for back-ups and duplication of systems," he explains. "But what we are doing is mission critical. Live events like this do not take any prisoners because there is only a single point of failure."

MRTC has been using Clear-Com systems for the last seven years, partly because they incorporate the latest technologies, including IP and other computer-industry techniques, but also for the reliability that they offer. "Clear-Com was ahead of its time by using IT connectivity quite early on," Rumbold says. "We first used its products on Formula 1 and now as a company we are involved in most motor racing series round the world using those systems."



As well as F1 and now Formula E, these include British Touring Cars and Le Mans, which Rumbold says uses "a hell of a lot of Clear-Com". MRTC offers different sizes of Clear-Com's Eclipse digital matrix systems, allowing it to build simple systems based on the 64-port Delta frame up to more extensive networks using the 460-port Omega series. "We use Omega systems for Formula E, with all connectivity over IP," Rumbold comments. "One of the advantages of this is that we don't have to worry about cabling or cumbersome add-ons."

As a leading supplier of communications equipment and technology for the motor racing market, MRTC is in the position of potential clients approaching the company with specific requirements for a particular project. "People come to us to produce solutions," Rumbold says. "A lot of customers tell us what they need, and because we work on many racing events we know the issues, which means we are able to make suggestions. We are advisers as much as suppliers of the products we use, and we work closely with our customers, often adjusting the budget to fit what they need and what they can afford."

Over the last 25 years TV sports production has embraced technology to bring viewers closer to the action; miniature and other specialist cameras now offer different angles that give everyone more of an insight into the game and what is happening. The ability to hear snatches of conversation over team radios in F1 and other motor sports has done something similar on the audio side.

While this is now a firm part of racing, people are always on the look-out for ways to push the concept. "It is the way the market is going," Rumbold acknowledges. "The race teams like the intercom idea and are even using it when they have meetings in offices near the track. The teams usually have adjoining rooms and the walls are thin, so using headsets means they can discuss tactics and other sensitive issues without being overheard."

The host broadcast coverage of Formula E also set out to use communications technology to its fullest from the start, not just on live TV but also for the sport's web site and mobile apps. "It's now been pushed to the point where the team radio for TV is truly live," Rumbold explains. "The material in F1 is somewhat sanitised, because it is recorded and then put on air two to three minutes later. But for Formula E it is mandatory in the regulations that audio is presented to race control and TV to do with as they wish. That means there can be an incident, such as a crash, and the drivers involved are able to put over their sides of the story immediately."

The team radio connections run from the engineering positions in the garages to the cars over a 5GHz wireless data transmission network. The signals carry both voice and telemetry, readings of the car's engine and electronics systems that are interpreted by the engineers to fine tune the systems for subsequent races. The radio transmissions are then connected back to race control and also made available to the broadcasters.

"All the comms come back from the car as four-wire intercom signals over data links," Rumbold says. "That audio can then be distributed wherever it is needed, including TV, the web site and apps." Another difference from the team radio familiar on F1 coverage is that the commentators for Formula E host broadcasts are also able to talk to the drivers while the race is on. "They've got direct access to the cars," Rumbold adds. "Because the commentators are professionals and the expert alongside them is an ex-driver they know when not to interrupt people at certain points in the race."

The car intercom interfaces with another Clear-Com system being used by the host broadcaster, with the two matrices talking to each other. But, explains Rumbold, the MRTC installation is able to extend even further than the race compound and broadcast facilities: "Because it is truly IT-based we can manage the data and send it wherever we or the clients want. For one Formula E meet, a race controller couldn't get to the track so we set up an intercom panel in his house."

This kind of expandability and flexibility is possible, Rumbold says, because the Clear-Com system works on a plug-and-play basis, with the potential to connect to any network. This facility is also available to the teams, which are able to link the manufacturer's factory with the engineers and drivers. "We can connect over the internet or create VLANs [virtual local area networks] with varying levels of security," he explains. "We use a lot of MPLS [multi-protocol label switching] connections to carry the data, which allows us to select how many people can speak directly to a car or other destinations."

By using IP connections and widely available networks, it is possible to link up between sites many thousands of miles apart. This potential has been used during the 24 Hours of Daytona endurance race in Florida. A team wanted to connect its premises in Germany to the race track, so panels were installed in Southern Germany and Florida, connecting via a Clear-Com matrix in MRTC's offices in England.

The possibility to add more capacity to the intercom system clearly appeals in a sport known for its technological excesses. During the 24-hour race at Le Mans some teams had more than 200 engineers and mechanics to work on just two cars, with each person having radio equipment and access to intercom panels. The London finale of the Formula E season saw the number of panels rise from 50 to 60 for the two-day event. Quite a modest increase but it is still early days for both this new class of motor racing and IP-based comms.

http://fiaformulae.com/

http://www.mrtc.co.uk/

Clear-Com AN HME COMPANY

MRTC

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KINETIC MEDIA AND DEJERO TAKE ON MILLION-DOLLAR TRIATHLON CHALLENGE IN THE MIDDLE EAST

Having spent a decade in charge of the live and post-production coverage of Challenge Wanaka, a full iron-distance scenic triathlon race in the Southern Lakes Region of New Zealand, Kinetic Media was the obvious production partner when it came to the launch of the prestigious Triple Crown Triathlon event in the Middle East in 2015.

CHALLENGE DUBAI تراثلون wearetriathlon!

The Triple Crown offered a mouth-watering million-dollar prize to any athlete who could win three specified races in 2015 and saw Swiss triathlete Daniela Ryf head home with the jackpot. As part of the event, Kinetic Media produced the live coverage of landmark races Challenge Dubai 2015 and Challenge Bahrain 2015 using Dejero's award-winning LIVE+ mobile transmitters to send live video out to local TV stations in both countries.

"Our experience working on Challenge Wanaka taught us that the use of traditional microwave links and helicopters place a huge drain on the budget and limit working time to when the choppers are in the air," explained Richard Sutcliffe, producer at New Zealand-based Kinetic Media. "Having first tested network bonding transmitters at the London 2012 Summer Games and from then on at Challenge Wanaka, we were well established with that technology when promoters in the Middle East came knocking on our door seeking a production company."

A key part of Kinetic Media's success in Dubai and Bahrain were Dejero's LIVE+ mobile transmitters, which were used to stream live HD video from field locations in both countries back to the OB trucks during the televised coverage of the inaugural races. The LIVE+ transmitters offered an alternative to the traditional satellite and microwave truck solutions, as they enabled Kinetic Media to transmit video from places that would simply have been inaccessible using traditional broadcast methods. The company continuously tracked the race action through the swimming, running and cycling courses to capture every moment of both the men and women's events. The team was able to use available cellular networks to reliably deliver live HD video all the way back to the production trucks without dropping frames,

regardless of the network conditions. The professional-grade rugged LIVE+ transmitter can be used to broadcast HD or SD video over any combination of cellular, Wi-Fi, Ethernet and satellite networks. It comes in a small, rugged briefcase or a camera-mount unit, which can be set up anywhere in seconds to broadcast live or transfer recorded video quickly from the field.

In Bahrain, Kinetic Media worked under the direction of Emmy Award winning Executive Producer Peter Henning, an American sports broadcasting legend. Reporting to the Kinetic team was a team from the Bahrain state television network, who supplied the outside broadcast (OB) facilities and production crew. In Dubai, Kinetic lead the production and worked with Dubai Television and with staff from service provider 7production, who supplied the OB equipment.

"These events were technically challenging to report on from an OB point of view," explained Sutcliffe. "Thankfully, we specialise in challenging conditions and we often joke that we only do the jobs nobody else wants! Working in blizzards, week-long road cycling tours in the rain, live coverage of 220 km races, we don't really shy away from the tricky stuff and we need to work with equipment that can support us." Our small team of producer, director, technical directors and motocam operators, together with support from Dejero, worked tirelessly to pull the coverage together for this event. Without all of them the production simply wouldn't have happened. The main challenges the team faced came from the nature of the sport, according to Sutcliffe. Iron-distance racing is a long eight to 12 hour day and in the Middle East, the Triple Crown races were half-distance which sounds much less daunting, until it's pointed out that participants are still dealing with courses of over 100 km long. While the Dubai course was a 'clover leaf' style race, where each of the three stages start and finish from the same point, in Bahrain the race was especially challenging because it was a point-to-point race meaning the start and the swim leg are over 100 km away from the finish line.

"It was a fabulous course, taking in highways, the Formula 1 race tracks and a wildlife park, definitely the most unique race in the world," enthused Sutcliffe. "Bahrain in particular required us to have a pretty complicated set-up: two OB units linked by satellite truck as well as Dejero's LIVE+ mobile transmitters for the four mobile cameras." The team also had to deal with vastly different infrastructures as comparatively, Bahrain has very few of the broadcast infrastructure resources that Dubai could put forward.

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"In Dubai, I gave the producer a production wish list to which he responded: 'this is your lucky day Mr Richard, none of this is a problem'. Bahrain on the other hand is a much smaller island kingdom without the same infrastructure," said Sutcliffe. "Additionally, there is no civil aviation in Bahrain, so no helicopters were available to us locally. This made our mobile links from the bikes, supported by the Dejero LIVE+ transmitters, the only coverage we had for this race. Fortunately, the telecoms network was very strong and having Prince Nasser as patron and one of the competitors meant that many doors that would have been closed were very much open." Budget therefore was a huge consideration, as the Kinetic team was relying on the local teams to facilitate the coverage. "Working within the assigned framework and budget is part of the challenge," added Sutcliffe. "In Bahrain for example, Peter Henning did a recce of the course with a microwave specialist, which ruled out that technology almost immediately in terms of cost. Thankfully, Kinetic was experienced enough to be able to pull off 4G live coverage with the help of the Dejero LIVE+ mobile transmitter." In fact, not only were Dejero's mobile transmitters more affordable to invest in than traditional microwave equipment, but the range and lack of digital artifacts far outperformed the RF links from the chopper on the Challenge Dubai shoot according to Sutcliffe. During the events, the rugged HD transmitters were mounted on motorcycles and boats to stream content back to the OB base for the duration of the event. Back at the OB base, Dejero's LIVE+ Broadcast Servers were deployed in the trucks to receive the video streams and process them for the live broadcast and the web. Both the Dubai and Bahrain races were multicast productions, which were live streamed to the web and broadcast to local television. A post-produced highlights show was then distributed globally.

"The set-ups for each race involved traditional OB trucks with the usual facilities and crew," explained Sutcliffe. "Alongside them we had our own live streaming set-up to output the finished show and we had our trusty Dejero mobile transmitters." The Bahrain race in particular required a six-camera OB truck located at the start of the race, on the swim leg. A second 12-camera OB unit was located 100 km away at the Bahrain Formula 1 racetrack, which is where the bike transition and race finish line were set-up. The Kinetic presenters and hosts were located there with a view on the finish line. A satellite link sent the switched feed from the swim start truck to the main unit, while the mobile Dejero LIVE+ transmitters sent their pictures independently over 4G cellular connections.

"Our director was in the main unit at the Formula 1 track and for the swim coverage, he cut between the feed from the truck and the Dejero mobile transmitters on the water," said Sutcliffe. "Once onto the bikes, we had four of the Dejero transmitters sending pictures of the leaders and chase group for both the men's and women's races out to the main OB truck 100 km away. These four links meant that we did not need to have multiple helicopters constantly airborne, relaying images through multiple microwave hops. That's the most amazing aspect of using Dejero's LIVE+ transmitters, I think."
Sutcliffe highlights other features that made the LIVE+ transmitters the ideal partner for this job, including the rugged cases that were easy for the team to handle and mount. The compact units were also easy to rig and de-rig from the bikes and boats and Sutcliffe's team also made great use of the IFB talkback capability. "In the past, the biggest problem we had was getting communications to cover hundreds of kilometers and without them, it's impossible to direct the cameras," explained Sutcliffe. "With Dejero's LIVE+ transmitters, we could access IFB talkback directly through the boxes." The V-lock battery option also gave the team a reliable source of power, as it couldn't draw power from the bikes.
"And through it all, we retained the frame rate even when the signal would fade," he added. "I was really impressed with the picture quality, it surpassed anything we have seen while using competing units in my opinion. Another benefit was that the Dejero technology is IT-based hardware, meaning that spares were readily accessible in case of emergencies. "And I can't say enough about the support we received from Dejero, including the on-site technician that worked with us over a three-day period to make sure everything went smoothly," he noted.

Ultimately, Sutcliffe feels that Kinetic could not have achieved this coverage at such high quality, within budget, without using Dejero's LIVE+ platform. "To produce an exciting show, you need to put the camera operators right down in the action and that's what Dejero enabled us to do," he concluded.

Dejero KINETICMEDIA

DORNA AND THE MotoGP

MotoGP IS THE PINNACLE OF MOTORCYCLE RACING

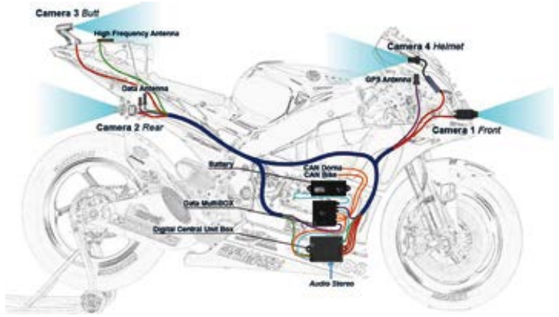
With an unrivalled 62-year history of elite competition, MotoGP is the world's premier motorcycling championship, comprising a nine-month, 18-round season, in 13 different countries, spanning 4 continents. Dating back to 1949, it is the oldest motorsport World Championship in existence. Since 1992 the commercial rights and the production of the international TV signals are owned by Dorna Sports SL, with the FIM remaining as the sport sanctioning body.

To all of the 18 race events around the world Dorna sends a team of more than 200 professionals to capture the race action and the drivers with 20 track feed cameras and 95! on-board cameras (up to four on each of the motor bikes). It was way back in 1985 at the MotoGP in Assen where the evolution of the onboard cameras started. Randy Mamola carried a 1,3kg system consisting of a 715g camera and a 610g control unit on board. He was hurtling around the track in excess of 200km/h and launched the camera into g-force history three decades ago and was happy to win the race.

Technology, innovation and passion

Dorna Sports SL keenly invested in on-board technology in order to enhance the sport's TV coverage. There were several familiar milestones in the progression of MotoGP's on-board camera development, but what sets its particular miniaturization and high-res-ification apart is the fact that each feat was accomplished in-house with a dedicated team of engineers who not only collaborated with, but provided crucial prototype testing on Sony RF cameras, Apple Final Cut Pro software, Canon and Fuji lenses, and probably a good deal of production, media streaming and plenty of other high-speed-racing video technology to arrive at a camera system weighting only 80g.

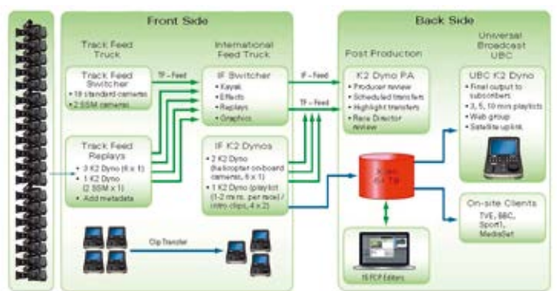
OnBoard Camera Comparison



The riders are delivering premium racing and the team at Dorna understands that MotoGP is a sport heavily dependent on premium video coverage. Ultimately the team listens to the fans to understand what they want and talk a lot with the broadcasters and video manufactures. They also monitor other sport events to always keep not only up to date but also up to speed.

Control of the Wireless Cameras

So what has the racing world learned from Dorna? There is actually much to envy about an organisation that invests heavily in R&D and sends 200 media personnel to each race. Engineering and television production was still outsourced when Dorna acquired the rights to MotoGP in 1992, but seeking an end to broadcast inconsistencies, it took all media operations in-house by 2000. Work at its Barcelona headquarters began in earnest to carve kilograms off cameras, halving their weight between 2002 and 2006 and then in partnership with Vislink/Gigawave doubling the number to four of the new lightweight cameras that could be mounted and controlled on each bike.
It should be said that the motorcycles raced in MotoGP are akin to speeding computer arrays, since 2008 carrying a data module that



Replay Management

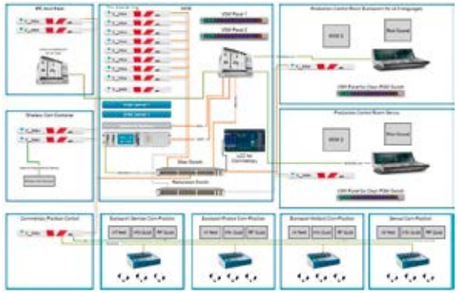
OnBoard Cameras

transmits bike telemetry and actuates servos. And those crazy lean-angles, the ones that put riders' knees and elbows on the ground as they make their way through a turn, were best captured by Dorna's contribution to the gyroscopic camera world in 2010.

Dorna has established a media language to produce motorsports, in terms of how fans experience the races in all aspects, the cut of the cameras, the language of the graphics, and how Dorna explains the elements of the race with the special camera angles. Today the coolest, whiz-bang MotoGP on-board is a proprietary 360-degree gyroscopic camera, first prototyped in 2014, and currently riding in an ongoing test phase, usually with the sport's most beloved celebrity rider Valentino Rossi.
To optimie use of the 360-degree camera rotation within and separate from the gyroscopic action, Dorna is developing new software that will automate the tracking of other riders, requiring communication between both bikes. This development will take some time, notes Sergi Sendra Director of TV Production at Dorna. "Tell me how many times we will have somebody fighting to pass for more than one lap? If a rider is alone on the track, it's a problem, because then we don't have somebody to watch. It's difficult to test something that only exists during the races."

The Switch from analogue Audio and SDI to IP

Dorna's most recent project is the transformation of a SDI production infrastructure to an IP production environment. For this innovative step Dorna relies on Lawo. Dorna has started this switchover by migrating the analogue audio infrastructure to IP. While in the past it was very complex to work with many audio signals, now in IP Dorna could open a new audio universe: Dorna has added sound movement to all graphic effects and is now able to add reverberation effects to bikes going faster than 300km/h. Beyond that Dorna is experimenting with including the sound of the knees rubbing the tarmac into the close-ups and super slow-motion images – all in 5.1 surround sound.



Dirna IP Setup for Eurosport and Servus TV

Following the success with IP audio, Dorna now has started to transfer SDI video to IP. The first steps were initiated prior to the 2016 kick-off race in Qatar on April 7. In close cooperation between the technical department of Dorna and Lawo it was decided to start with the integration of rights-holding broadcasters, in particular with Servus TV and Eurosport with its French, German and Dutch flavors into an IP based signal distribution network. It integrates video, audio, system control, KVM, intercom and communications into one operational internet browser.

Sergi Sendra, Director of TV Production at Dorna

Sergi Sendra acknowledges: "Lawo is one of the most innovative companies I've found in the last few years. Lawo is investing in a technology that fits perfectly with the vision of the future we have at Dorna. Therefore we continue to work closely together on the realization of an IP based solution for the control of live signals."

The system to produce the international signal of the MotoGP consists of about 140 cameras, a similar number of lines for the replays in slow-motion, super slow-motion and hyper slow-motion plus the various graphic lines to include speed, heartbeat and other information into the video signal. Currently the heart of the IP configuration is a Lawo Nova 73 audio router and two Arista 10GbE switchers controlled by two redundant Lawo VSM servers located in the master control room (MCR). This already is a much simpler and more versatile solution than the traditional SDI router which now is replaced by 21 Lawo V__link4s for transport and processing of audio and video signals according to SMPTE2022-6.

Lawo Commentary Unit

Also for the commentator units Dorna has opted for Lawo Commentary Units (LCU). Four LCUs are connected to a Dallis Frame in the MCR via a V__link4. The LCU can be controlled directly from the commentator positions or remotely via the Lawo Commentary control (LCC) which is located in the MCR. The V__link4 also receives video streams according to the requests of the commentators and vice versa it is possible to send a video stream of the commentator back into the IP network.

Asked about the confidence in a software based system, Sergi Sendri admits, "of course the matrix is a point of risk, but software based systems have become a part of our daily life, from the mobile to the fridge ... software is everywhere," and he continued, "in 1999 when we decided to create our own timing & scoring system we didn't do more than employing a team of programmers at Dorna. From there we have started to develop countless software tools that have allowed us to improve graphics, our MAM and also management tools. Certainly there has been a communion between software and television. For this reason we should not be scared."

MotoGP in 4K

Already in September 2015 Dorna collaborated with BT Sports, its UK broadcasting partner, to produce live coverage of the Octo British Grand Prix at Silverstone in Ultra High Definition. The event marked the first time a MotoGP World Championship event was covered live in Ultra HD, with viewers of the BT Sport UHD channel having the exclusive experience of watching Qualifying on Saturday and the Races on Sunday in the 4K Ultra High Definition format. With 19 UHD cameras covering the Silverstone circuit, including a High Speed, Super Slow Motion Camera and the world´s first live wireless 4K cameras, provided by Vislink, BT Sport Ultra HD viewers were able to immerse themselves fully in the latest development of MotoGP TV coverage. The UHD coverage was in addition to Dorna Sports' provision of the International Programme Feed in High Definition for all worldwide broadcasters. Over the weekend at Silverstone, there were more than 140 HD live cameras at the circuit, allowing for coverage from every angle. The addition of the Ultra HD cameras brought the total number of live cameras to 160, the largest amount ever seen at a MotoGP event. Manel Arroyo, Managing Director, TV & Media Area Dorna Sports, said: "We are really pleased that we have reached a stage where the BT Sport and Dorna production teams are working together to deliver full coverage of the MotoGP in this new format. BT Sport is the first broadcasting partner to take advantage of 4K and Dorna Sports is excited to continue developing our Ultra High Definition offerings as more partners around the world adopt this format.

LAWO DORNA BT Sport ULTRA HD VISLINK

AMP VISUAL TV

LIVE PORTRAIT

Millenium Signature 12

OB Van

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

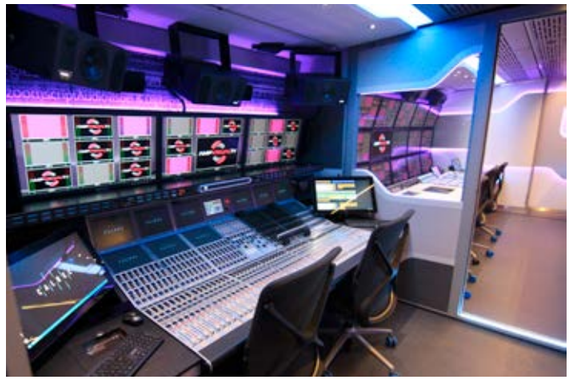
stephane.dery@ampvisualtv.tv
http://www.ampvisualtv.tv

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 400 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.

AMPVISUALTV

Production Area

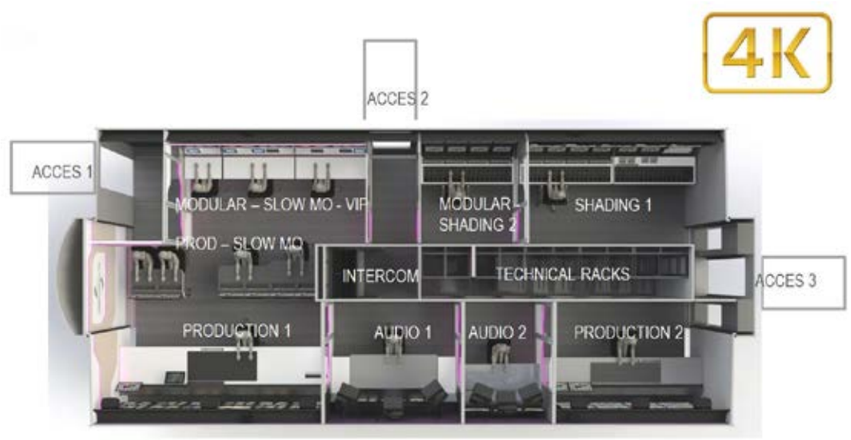


Sound Area

Vision Mixer

SloMo Desk

Camera Shading



LIVE PORTRAIT

Millenium Signature 12

OB Van

Double Expando: 14,5 Long, 4m High, 2,5 Wide – Expands to 6,1m
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

Video

- 22 UHD Cameras (HDC-4300) up to 44 HD Cameras
- Fiber Connectors from Lemo
- Lenses from Canon, UJ90, CJ20, CJ12
- Heavy Duty Tripods from Vinten
- 4K Vision Mixer: Sony XVS-8000 5M/E 4 Keyers
- HD Vision Mixer: Sony MVS-8000 3M/E 4 DVEs
- Monitors in 4K Production Area from Sony BVW-X300 and EIZO 4K
- Monitors in Camera Shading Area from Sony BVW-X300
- Up to 4 UHD Deck and USB Recorders
- 10 UHD LSMs up to 14 HD LSMs (EVS XT3 12 Ch)
- 10Gb, 3Gbs SDTI, and GigE Network
- Digital Glue from Riedel
- Redundant System Controller: Lawo VSM
- Video Router: Riedel Mediornet 308 x 347 UHD up to 504 x 546 HD
- Measurement: Tektronix WFM-5000/8200

Audio

- Audio Mixer 1: Calrec Apollo (56 Faders)
- Audio Mixer 2: Calrec Artemis (16 up to 40 Faders)
- Apollo & Artemis Stage Boxes 32 x 32 Mic/Line
- Riedel Router: 8x 64 x 64 MADI, 28 x 10 AES
- Audio Monitoring:
  Genelec, 5.1 Surround Sound (Dolby)
- Audio Multi-track: Pyramix
- Audio Effects: TC Electronic M6000
- Audio Server: Ableton with Soundforge Editing
- Microphones from Sennheiser, Neumann, Schoeps
- Audio Measurement: Tektronix WVR-7200

Intercom/Communication

- Matrix: Riedel Artist 256 x 256
- 4 interfaced 2 wire RTS Network
- 2 Hybrid Telephones
- 3 ISDN and IP Codec
- Wireless Intercom System 2 radio Simplex / 2 radio Duplex
- Stage Box Intercom: ERECA RACER

System Integrator

- Videlio-Media

ARENA TELEVISION

LIVE PORTRAIT

Arena OBX

OB Van

General Contact

Arena Television Ltd.

Hangars 4, 5 & 7
Redhill Aerodrome, Kings Mill Lane
Redhill, Surrey
RH1 5JY
United Kingdom

Peter Love

Tel: +44 1737 822011

peter.love@arena-tv.com
www.arena-tv.com/

In an industry dominated by multinationals, Arena is proud to be British and pay all taxes in the UK.

Arena holds contracts with the nation's major broadcasters to provide coverage of events, music, large studio shows and sport. Arena is a Telegraph 1000 business that has remained in continuous family ownership for approaching 30 years. Arena continues to pioneer by introducing the world's first IP-based UHD High Dynamic Range OB fleet. The new triple-expands (OBX, Y & Z) all feature UHD/HD/SD multicast technology. They are based around a powerful IP core developed in association with Grass Valley and Cisco. This approach is much more flexible than traditional baseband.

Production Area

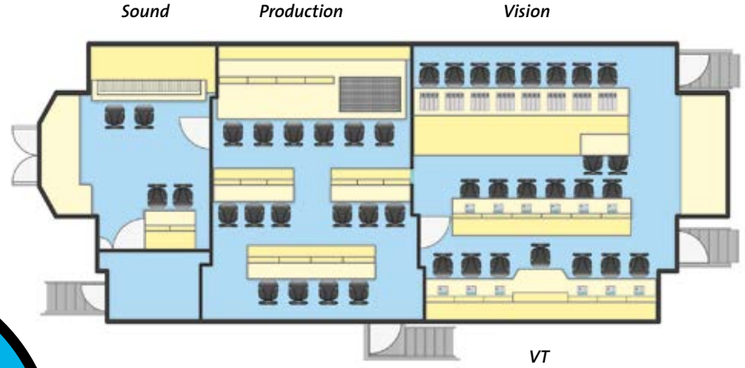
Sound Area

Camera Shading Area

Cisco Fibre Patch

SloMo Desk

Grass Valley Vision Mixer



TECHNICAL SYNOPSIS

Arena OBX

OB Van

Double Expando:
15,7m Long, 4,0m High, 2,55m Wide – Expands to 6,2m
Shifts between 4K/UHD+HDR |
Super SloMo | 1080p | 1080i | 720p

Video

32 Grass Valley LDX-86N UHD (Fiber)
32 Grass Valley XCUs (Fiber)
8 Super SloMo Cameras Grass Valley/Sony/I-MOVIX
Lenses from Canon, UJ86, UJ90, CJ12, CJ20
Heavy Duty Tripods from Vinten
Vision Mixer:
Grass Valley HD/4K Kayenne K-Frame Switcher
14 Panasonic Monitors with Multi-Viewer (200+ images can be displayed)
Grass Valley Kaleido KMX Multivieer/Splitter
Character Generator: As requested by Clients
Monitors in Camera Shading Area from Sony & Canon
12 EVS XT3/XT4K 12 Ch Full Editing Replay Servers
UHD SloMo/ SuperSloMo Devices from EVS and Grass Valley (up to 12)
Digital Glue from Axon
No Video Matrix: This is an IP truck so all data flows everywhere without a standard matrix using GV Nodes and a Cisco datacentre switch

Audio

Audio Mixer: Calrec Apollo (64 fader)
No Audio Router: This is an IP truck so all data flows everywhere without a standard matrix using GV Nodes and a Cisco datacentre switch
Audio Monitoring: Genelec, 5.1 Surround Sound with Dolby Atmos
Audio Measurment: Dolby/Calrec
Audio Multi-track: As requested by Clients
Microphones from Sennheiser, beyerdynamic

Intercom/Communication

Matrix: Riedel Artist

Special Features

This OB unit is a world first being the first large-scale implementation of a native IP work flow capable of multi-casting in UHD HDR, UHD SDR, HD and SD. Data is fully IP from the camera CCU through the vision mixer to transmission. This makes the truck considerable more capable than the existing baseband approach that uses 4 copper cables for each path.

IP maintains and enhances the high production standards of an HD workflow
No bottlenecks associated with legacy baseband Quad-HD designs
Supports both GV's (and Sony's) native UHD cameras
A base-band Quad-HD layer for legacy and back-up purposes
Scalable on-site and off-site remote production as standard
Multi-format HDR as standard; upgradeable to 4K high frame rates and 8K
New outboard fibre-nod technology reduces cable rigging time and costs
Highly scalable allowing requirements to change on the day
Cisco 10GbE and 40GbE switch; SPMTE 2022-6 with TR03/04 support
UHD 2Si for significant benefits in resilience and monitoring

Coach Builder

ASGB

System Integrator

Videlio

CLARK MEDIA

LIVE PORTRAIT

UHD Truck

OB Van

General Contact

Clark Media
Gary C Snyder

rentals@clarkmedia.com
www.clarkmedia.com

East Coast:
296 Broadhead Road,
Bethlehem, PA 18017
United States of America

+1 601 694 9800

West Coast:
2512 North Ontario Street
Burbank, CA 9504
United States of America

+1 818 435 4689

CLARK MEDIA provides corporations, production companies and networks with broadcast equipment rentals and production services.

We have a full-time staff of rental managers, engineers and production professionals ready to provide a custom solution for your project. Clark Media has extensive experience in providing modular video and audio systems for the production of in-studio and on-location television series and events.
We harness the resources of our in-house engineering department with the large inventory of broadcast equipment in our rental department to provide a single source solution for even the largest events.

CONTENTS

Production Area

Patch Panel

CLARK MEDIA
Heads-Up Thinking™

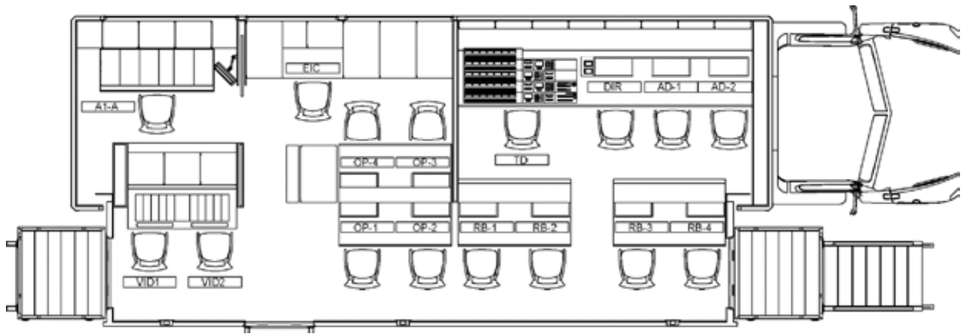
Monitor Wall

Sound Area

SloMo Desk

Camera Shading Area

Vision Mixer



TECHNICAL SYNOPSIS

UHD Truck

OB Van

Single Expando: 40' Long, 13' High, 8'6" Wide – Expands to 16'
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

Video

- 10 Sony HDC-4300 or Panasonic AK-UC3000
- Lenses from Canon XJ95, HJ22, HJ14
- Heavy Duty Tripods from Vinten and Sachtler
- Vision Mixer: Grass Valley HD/4K Kayenne K-Frame Switcher 4M/Es
- Character Generator: Chyron Mosaic eFX
- OLED Monitors in Production Area from Sony
- OLED Monitors in Camera Shading Area from Sony
- 3x EVS XT3 6 Ch Full Editing Replay Servers
- One of the 6 Ch XT3's can be used for Spotbox
- 10Gb, 3Gbs SDTI, and GigE Network
- EVS XFile with USB 3.0
- Wired for any Combination of 12 Recorders
- Digital Glue from AJA, For-A and Cobalt
- Video Matrix: Imagine Platinum IP3 208 x 288
- Measurement: Leader LV-5333

Audio

- Audio Mixer: Calrec Artemis Light (40 fader)
- Hydra 2 Stage Boxes
- Audio Matrix: Imagine Platinum 128 x 128 MADI
- Audio Effects: Yamaha SPX2000
- Audio Monitoring: Fostex 6301B
- Audio Multi-track: Digicart EX and Denon 64ch
- Microphones from Sennheiser, Electro Voice and Sony

Intercom/Communication

- Matrix: RTS ADAM 104 x 104
- RTS 4030 IFB Beltpacks
- Sennheiser HMD-25 Announcer Headsets
- RTS TIFF 2000
- QKT Phone Hybrids
- KP-32 w/RVON

Power Required

- 208 VAC, three phase, 200amps

Coach Builder

- Gerling Super Stallion Series on Peterbuilt Chassis

CONTENTS

CROATEL

LIVE PORTRAIT

UHD OB5

OB Van

General Contact

CROATEL d.o.o.

Pantovcak 265
10000 Zagreb
Croatia

Tonko Barac, M.Sc.E.E.
Managing Director

Tel: + 385 1 455 2000

tonko.barac@croatel.hr
www.croatel.hr

CROATEL company has been active on the market for over 20 years and currently has 66 employees.

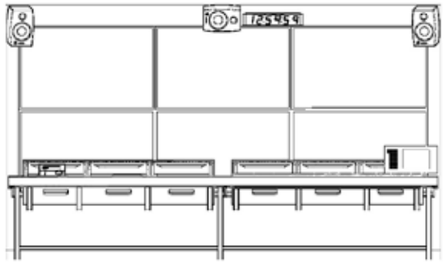
CROATEL has been licensed by the Croatian Post and Electronic Communications Agency since 1995. Ownership, realization and 24/7 service of HDTV playout system that broadcasts six sports channels in HD resolution currently broadcasted through Croatian Telecom MAX TV platform (UEFA Champions League, Europa Football League, Croatian Football League etc.)
Playout Facility
HDTV sports production, ownership of two HD OB vans including 16 HD cameras + third brand new UHD OB van in 4K (realization of the UEFA Champions League HD production, realization of all Croatian Football League games etc.

Production Area

CROATEL

Sound Area

SloMo Desk



Monitor Wall

Camera Shading Area

TECHNICAL SYNOPSIS

UHD OB5

OB Van

Double Expando: 12m Long, 4m High, 2,5 Wide – Expands to 4,6m
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

Video

- 16 Sony HDC-4300 4K/UHD/SSMO Cameras (predicted)
- 4 Sony HDC-4800 (predicted)
- Lemo Fiber Connectors
- Cobham ProRXD Wireless Camera system
- Lenses from Canon
- Heavy Duty Tripods from Sachtler
- Vision Mixer: Sony XVS-8000 with 4K option
- Character Generator: Caspar CG
- Monitors in Production Area from Sony: 6x FW-49X8370C
- Monitors in Camera Shading Area from Sony PVM-A170
- Reference monitor Sony: OLED BVM-X300
- Multiviewer/Splitter/Sync generator from Evertz
- 2x EVS XT3 Channel MAX 12 Ch Full Editing Replay Servers with 4K option
- 10Gb, 3Gbs SDTI, and GigE Network
- EVS XFile with USB 3.0
- Digital Glue from Evertz
- Video Controller: Lawo VSM
- Video Matrix: Evertz EQX 288 x 480 3G/4K Router
- KVM Devices from Guntermann & Drunck
- Measurement Equipment: Tekronix WFM8200

Audio

- Audio Mixer: Studer Vista 5 M3
- Audio Matrix: Evertz EMR48AES & EMR96AA
- RTW TM7 Audio Scope
- Audio Monitoring:
  Genelec, 5.1 Surround Sound
- Audio Effects: Lexicon PCM96
- Microphones from Sennheiser, DPA

Intercom/Communication

- Matrix: Riedel Artist 64 x 64
- Clear-Com Freespeak
- Glensound Telephone Interfaces

System Integrator/Coach Builder

- TVC

DOME PRODUCTIONS

LIVE
PORTRAIT

Dome Pioneer

OB Van

General Contact

Dome Productions

1 Blue Jays Way, Suite 3400,
Rogers Centre, Gate 13
Toronto
ON M5V 1J3
Canada

Bruce Gaum
Director of Client Solutions and Technology

Tel: +1 416 341 2045

bgaum@domeprod.com
http://domeproductions.com

Dome Productions is owned by Bell Media and Rogers Media Inc.

As one of North America's leading production facilities providers, Dome Productions offers mobile production facilities, transmission services, studio facilities and full turnkey host broadcast services. Dome Productions offers a fleet of 18 multi-format production mobiles (2 of which are UHD capable), 7 support units, 1 production/uplink mobile and 3 uplink tractors. The downtown Toronto production facility offers the most current video equipment, multiple studio facilities, and a team of video production experts. Dome Productions is 27 Years in Business.

Production Area

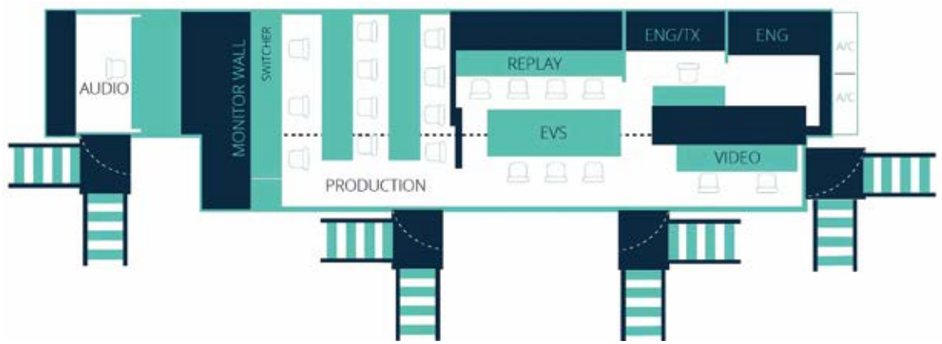
Monitor Wall

Vision Area

HDC-4300 Camera

Sound Area

Camera Shading Area



TECHNICAL SYNOPSIS

Dome Pioneer

OB Van

Single Expando: 53' Long, 13'6" High, 8'6" Wide – Expands to 13'6"
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

Video

10 Sony HDC-4300 4K/UHD/SSMO Cameras SMPTE Only
10 HDCU2000L 1080p Camera Base Station – Joystick OCP
10 BPU4000 4K Processors
2 HD POV Cameras
Lenses from Fujinon, UA80, UA22, UA13
Heavy Duty Tripods from Vinten and Mathews
Vision Mixer: Grass Valley HD/4K Kayenne K-Frame Switcher 2M/E, 48 UHD in / 24 UHD out, 6 Keyers/ME, Elite Licence Package
Virtual Monitors Wall via Router (288+ images can be displayed) for PGM + PVW Sony PVM-X300
Character Generator: Chyron HyperX³ with Lyric Pro
Monitors in Camera Shading Area from Sony
5 EVS XT3 12 Ch Full Editing Replay Servers
1 EVS XT3 4Chl Spot Box
10Gb, 3Gbs SDTI, and GigE Network
EVS XFile3 with USB 3.0
EVS UHD Epsio Zoom
Sony: 1 XDS-PD1000, 1 HDCam SR SRW-5500, 1 UHD PMW-PZ1
Digital Glue from Evertz
Video Matrix: Evertz EQX 135 x 112 UHD

Audio

Audio Mixer:
Calrec Artemis Beam w/Bluefin (64 Faders)
Audio Matrix:
Calrec Hydra Analog 96 x 96, AES 64 x 64
2 RTW TM7 Audio Scope
Audio Monitoring: Genelec, 5.1 Surround Sound
Audio Multi-track: Digicart EX w/SD Card Drive
Microphones from Sennheiser, Electrovoice

Intercom/Communication

Matrix: RTS ADAM 144 x 144
RTS 4030 IFB Beltpacks
RTS BP325 Headset Boxes
RTS TIFF 2000
Telos Hx2 Digital Telephone Interefaces
JK Audio Innkeeper 2
Two-Way Radios with two Base Stations

Power Required

2x 208 VAC, three phase, 200amps
or 1x 208VAC, three phase, 300amps

DOME PRODUCTIONS

LIVE PORTRAIT

Dome Trillium

OB Van

General Contact

Dome Productions

1 Blue Jays Way, Suite 3400,
Rogers Centre, Gate 13
Toronto
ON M5V 1J3
Canada

Bruce Gaum
Director of Client Solutions and Technology

Tel: +1 416 341 2045

bgaum@domeprod.com
http://domeproductions.com

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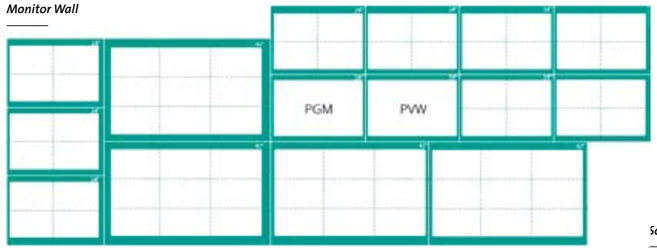
Production Area

Monitor Wall



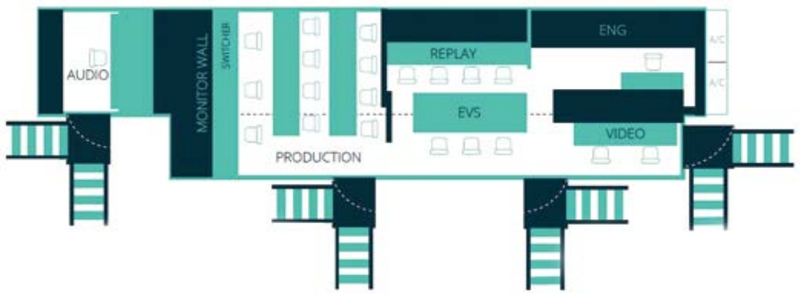
Vision Area

HDC-4300 Camera

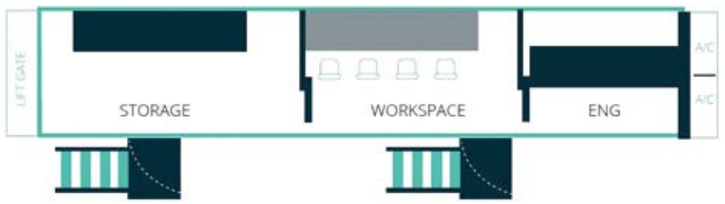
Sound Area

Camera Shading Area

A Unit



B Unit



TECHNICAL SYNOPSIS

Dome Trillium

OB Van

Single Expando: 53' Long, 13'6" High, 8'6" Wide – Expands to 14'6" –
B-Unit is Required for 4K Production
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

Video

10 Sony HDC-4300 4K/UHD/SSMO Cameras
10 HDCU2000L 1080p Camera Base Station – Joystick OCP
10 BPU4000 4K Processors
Lenses from Canon UJ90, HJ24, CJ12
Heavy Duty Tripods from Vinten and Mathews
Vision Mixer: Grass Valley HD/4K Kayenne K-Frame Switcher 2M/E, 48 UHD in / 24 UHD out, 6 Keyers/ME, Elite Licence Package
12 Monitors with Multi-Viewer (74+ images can be displayed)
Character Generator: Chyron HyperX³ with Lyric Pro
Monitors in Camera Shading Area from Sony
6 EVS XT3 12 Ch Full Editing Replay Servers
1 EVS XS 4Channel Spot Box
10Gb, 3Gbs SDTI, and GigE Network
EVS XFile3 with USB 3.0
1Sony XDS-PD1000 and 2 Sony HDCam SR SRW-5500
Digital Glue from Grass Valley
Video Matrix: Grass Valley Trinix 64 x 32 UHD

Audio

Audio Mixer: Calrec Alpha 100 w/Bluefin (64 fader)
Audio Matrix: Grass Valley Apex 256 x 256
RTW TM7 Audio Scope
Audio Monitoring: Genelec, 5.1 Surround Sound
Audio Multi-track: Digicart EX w/SD Card Drive
Microphones from Sennheiser, Electrovoice

Intercom/Communication

Matrix: RTS ADAM 128 x 128
RTS 4030 IFB Beltpacks
RTS BP325 Headset Boxes
RTS TIFF 2000
Telos Hx2 Digital Telephone Interefaces
Two-Way Radios with two Base Stations

Power Required – A-Unit

2x 208 VAC, three phase, 200amps
1x 208 VAC, three phase, 300amps

Power Required – B-Unit

208 VAC, three phase, 200amps

EUROMEDIA A21

LIVE PORTRAIT

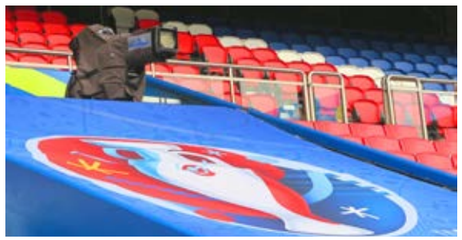
A21

OB Van

General Contact

EUROMEDIA
29 avenue George Sand
93210 Saint-Denis
France

Xavier Devreker
Head of Sports and Outside Broadcast
Tel: +33 1 83 72 67 73
xavier.devreker@em.fr
www.em.fr



EUROMEDIA - a French company part of Euro Media Group – is a full service company, leader in TV facilities and solutions for media and broadcast organisations.

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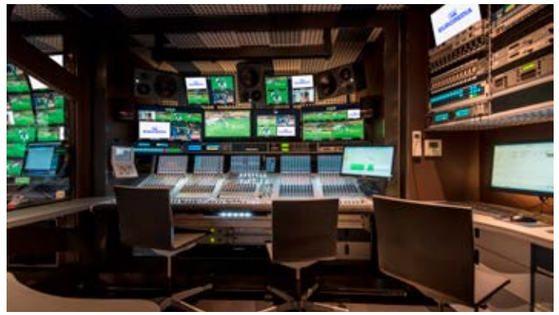
Production Area

Vision Mixer and Monitor Wall

SloMo Desk

Sound Area



Camera Shading

Production Area 2

TECHNICAL SYNOPSIS

A21

OB Van

Double Extension:
18m Long, 4m High, 2,50m Wide – Expands to 5,5m
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

Video

16 Sony HDC-4300 4K/UHD/SSM Cameras
or a combination of 30 HD Sony HDC Cameras
Cable Connectors: Lemo 3T and Lemo 3K SMPTE
Lenses from Canon
Heavy Duty Tripods from Vinten
Vision Mixer: Grass Valley K-Frame Ibox
with Kayenne Panel 5 ME
and with Kayenne Panel 2 ME
Character Generator: on demand
PGM Monitor: Penta HD 24" + 23 Vutrix Quad Slim LED 24" Monitors
Multiviewer/Splitter from Evertz: VIP
Sony OLED BVM 17" Monitors in Camera Shading Area
16 Slots for VTs and EVS available
12x EVS XT3 12 Ch Full Editing Replay Servers
10Gb, 3Gbs SDTI, and GigE Network
Digital Glue from SAM
Video Controller: LSB VSM
Video Matrix: SAM Sirius 840 480 x 720
KVM Devices: BlackBox ServSwitch 64 x 16
Measurement: Tektronix WFM-5000, WVR-7120

Audio

Audio Mixer: Studer Vista X, Core400 (50)
Audio Matrix: SAM Sirius 3504 x 3808 EMBEDED/MADI/AES
RTW TM7 Audio Scope
Audio Monitoring: Neumann KH:310A, KH:120, 810G 5.1 Surround Sound
Audio Multi-track: PC with Madi card RME: software Reaper
Microphones from Sennheiser, Neumann, Schoeps
AudioEffects: TC Electronics M2000, DB4
Measurement: RTW TM7 (with multichannel, BLITS, LU)

Intercom/Communication

Matrix: RTS ADAM-M 256 x 256, Analog + OMNEO + MADI
Wireless Talkback: Motorola, Wisycom (Overline on demand)
AETA HifiScoop Digital Telephone Interfaces

Coach Builder

TTK, Design by Project Builders

System Integrator

EUROMEDIA

EUROMEDIA B40

LIVE PORTRAIT

B40

OB Van

General Contact

EUROMEDIA

29 avenue George Sand
93210 Saint-Denis
France

Xavier Devreker
Head of Sports and Outside Broadcast

Tel: +33 1 83 72 67 73

xavier.devreker@em.fr
www.em.fr

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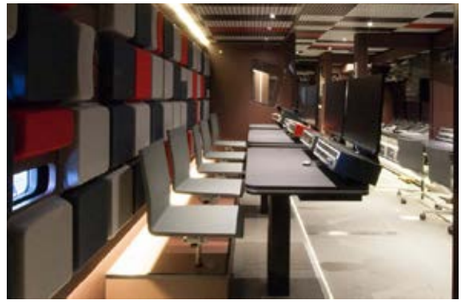
Production Area

SloMo Desk

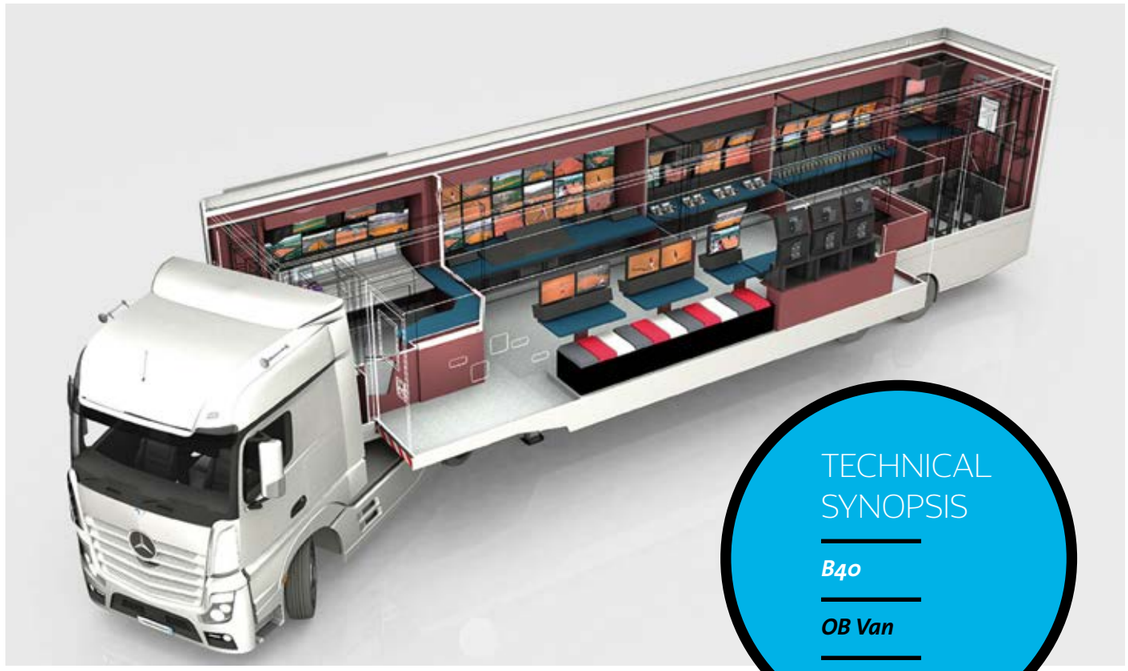


Sony Camera

EUROMEDIA

Inside View

Camera Shading



TECHNICAL SYNOPSIS

B40

OB Van

Double Expando: 18m Long, 4m High, 2,55m Wide – Expands to 4,6m
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

Video

24 Sony HDC-4300 4K/UHD/SSM Cameras
Also available: Grass Valley LDK or Sony HDC-3300
Wireless Camera Adapters: Livetools HD RUNNER III / HD TRACER III
Cable Connectors: Lemo Triax, , Lemo SMPTE Fiber
Lenses from Canon 11x, 14x, 17x, 21x, 55x, 72x, 86x, 100x
Heavy Duty Tripods from Vinten
Vision Mixer: Grass Valley K-Frame Ibox with Kayenne Panel 5 ME and with Kayenne Panel 2 ME
Character Generator: EUROMEDIA GFX, ChyronHego, ViZrt
Monitors in Production Area: 23x Vutrix 24", 1x Penta 24", 12x Eizo 24"
Multiviewer/Splitter Evertz and Vutrix
Monitors in Camera Shading Area: 5x Sony BVM OLED
23 Slots for VRTs and Disk Recorders are available
6x EVS XT3 12 Ch Full Editing Replay Servers
10Gb, 3Gbs SDTI, and GigE Network
Digital Glue from SAM
Video Controller: LSB VSM
Video Matrix: SAM Sirius 840 408 x 596
KVM Devices: BlackBox ServSwitch 64 x 16
Measurement: Tektronix WFM-5200, WVR-8200

Audio

Audio Mixer: Studer Vista 9 (52 Faders)
Audio Matrix:
SAM 3120 x 1968 EMBEDED/MADI/AES
RTW TM7 Audio Scope with BLITs, LU
Audio Monitoring, 5.1 Surround Sound:
Neumann KH:310A (x3) + 120 (x2) + 810 (x1)
Audio Multi-track: PC with Madi card RME: software Reaper
Microphones from Sennheiser, Neumann, Schoeps (on demand)
AudioEffects:
TC Electronics M2000, M6000, DB4

Intercom/Communication

Matrix: RTS ADAM-M 128 x 128
(64 Analog + 32 OMNEO + 32MADI
Wireless Talkback: Motorola, Overline
Prodys Prontonet ISDN Codecs

Coach Builder

Toutenkamion

System Integrator

EUROMEDIA

CONTENTS

Production Area

Inside View

EUROMEDIA

LIVE PORTRAIT

C42

OB Van

EUROMEDIA - a French company part of Euro Media Group – is a full service company, leader in TV facilities and solutions for media and broadcast organisations.

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General Contact

EUROMEDIA

29 avenue George Sand
93210 Saint-Denis
France

Xavier Devreker
Head of Sports and Outside Broadcast

Tel: +33 1 83 72 67 73

xavier.devreker@em.fr
www.em.fr

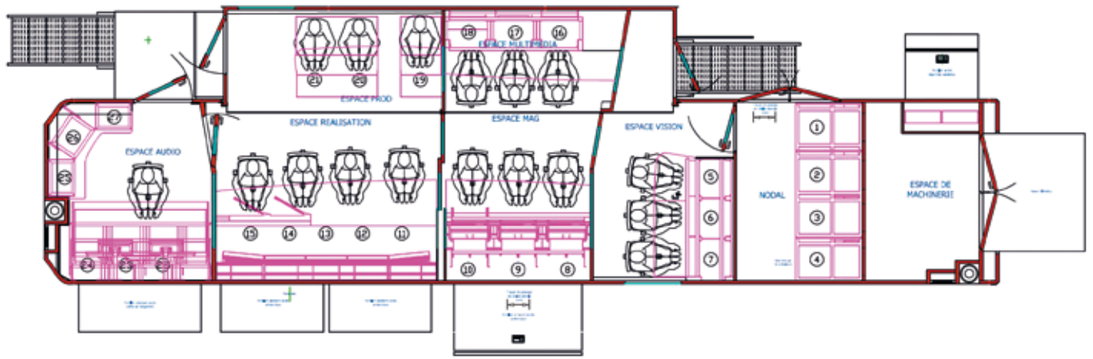
EUROMEDIA

Sound Area

Sony Camera with Fujinon Lens

Camera Shading

SloMo Desk



TECHNICAL SYNOPSIS

C42

OB Van

Single Extension: 12,8m Long, 4m High, 2,45m Wide – Expands to 3,75m
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

Video

12 Sony HDC-4300 4K/UHD/SSM Cameras
or a combination of 12 HD Sony HDC Cameras
12 HD Cameras Grass Valley LDK-8000 or Sony HDC-1500
Cable Connectors: Lemo Triax, , Lemo SMPTE Fiber, Neutrik Fiber
Lenses from Canon and Fujinon,
Heavy Duty Tripods from Vinten and Miller
Vision Mixer: SAM Kahuna 9600 with Maverik Control Panel
Character Generator: ChyronHego, Ross, VizRt
Vutrix Monitors in Production Area
Multiviewer/Splitter from Evertz: VIP
Sony OLED Monitors in Camera Shading Area
6x EVS XT3 12 Ch Full Editing Replay Servers
10Gb, 3Gbs SDTI, and GigE Network
Digital Glue from SAM
Video Controller: LSB VSM
Video Matrix: SAM Sirius 830 264 x 404
KVM Devices: BlackBox ServSwitch Octet
Measurement: Tektronix WFM-5200, WVR-8200

Audio

Audio Mixer: Lawo mc²56
Audio Matrix: SAM Sirius 830 1968 x 1584 EMBEDED/MADI/AES
RTW TM7 Audio Scope
Audio Monitoring: Neumann KH:120 5.1 Surround Sound
Audio Multi-track: PC with Madi card RME: software Reaper
Microphones from Sennheiser, Neumann, Schoeps
AudioEffects: TC Electronics M3000

Intercom/Communication

Matrix: RTS ADAM-M 128 x 128, Analog+ OMNEO+MADI
Wireless Talkback: Motorola, Overline
AETA HifiScoop Digital Telephone Interefaces

Coach Builder

TTK, Design by Project Builders

System Integrator

EUROMEDIA

CONTENTS

GEARHOUSE BROADCAST

LIVE PORTRAIT

HD8

OB Van

General Contact

Gearhouse Broadcast Pty Ltd

Unit 1, 154 O'Riordan Street
Mascot
NSW 2020
Australia

Manny Papas
Sales Director

Tel: +61 2 9313 3100

australia@gearhousebroadcast.com.au
http://www.gearhousebroadcast.com/au

Gearhouse Broadcast Australia is located in Sydney and Melbourne.

It provides broadcast services around Australia, specialising in outside broadcast, project solutions and dry hire equipment rental. Gearhouse Broadcast Australia is a leader in HD outside broadcast technology. Its ever-growing fleet currently consists of nine HD units, of various sizes, and one SD unit. The outside broadcast business covers a wide range of sporting and entertainment events, most notably the V8 Supercars, Super 15s Rugby and A-League Football for Fox Sports. Project Solutions delivers broadcast solutions for major televised sporting events and reality television. Gearhouse has led projects at the Australian Open Tennis, the Commonwealth Games and for I'm A Celebrity and Celebrity "GET ME OUT OF HERE".

Production Area

Vision Mixer with Monitor Wall

GEARHOUSE BROADCAST

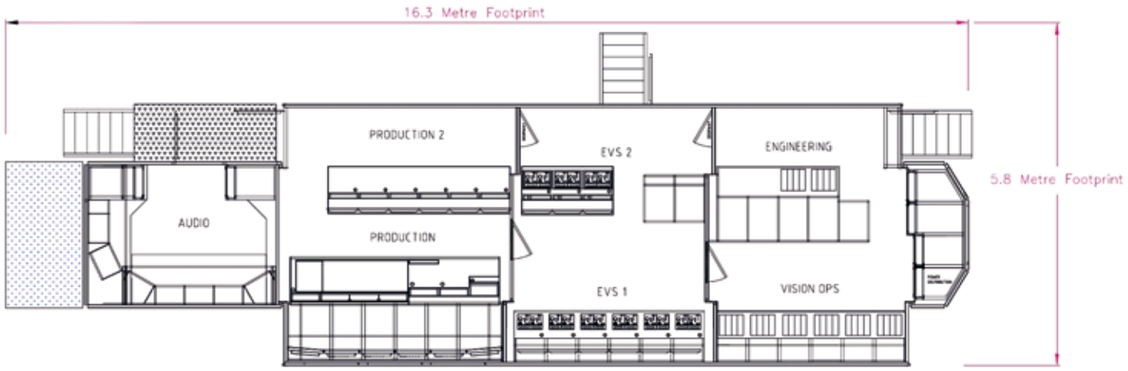
SloMo Desk

Sound Area

Equipment Racks

Camera Shading Area

EVS Servers



TECHNICAL SYNOPSIS

HD8

OB Van

Double Expando: 16,1m Long, 4,3m" High, 2,6m Wide – Expands to 5,8m
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

Video

30 Cameras incl. Hitachi SK-UHD4000, Sony HDC-4300 and POV
Lenses available from Canon and Fujinon
4 HH ENG viewfinders
Vision Mixer: Sony MVS-7000X, 4ME, 4ch DVE
Character Generator: Chyron HyperX³ or VizRT
90+ Monitors in Production Area 1 from Sony and Boland
48+ Monitors in Production Area 2 from Sony and Boland
Quad Split Processors from Imagine QVM6800
Up to 72 Monitor Signals in Replay Area 1 on Ikegami Monitors
Up to 36 Monitor Signals in Replay Area 2 on Ikegami Monitors
OLED PVM-1741 Monitors in Camera Shading Area from Sony
7x EVS XT3 8 Ch Full Editing Replay Servers
10Gb, 3Gbs SDTI, and GigE Network
Video Matrix: Miranda NV8576 3G Hybrid Router 314 x 522

Audio

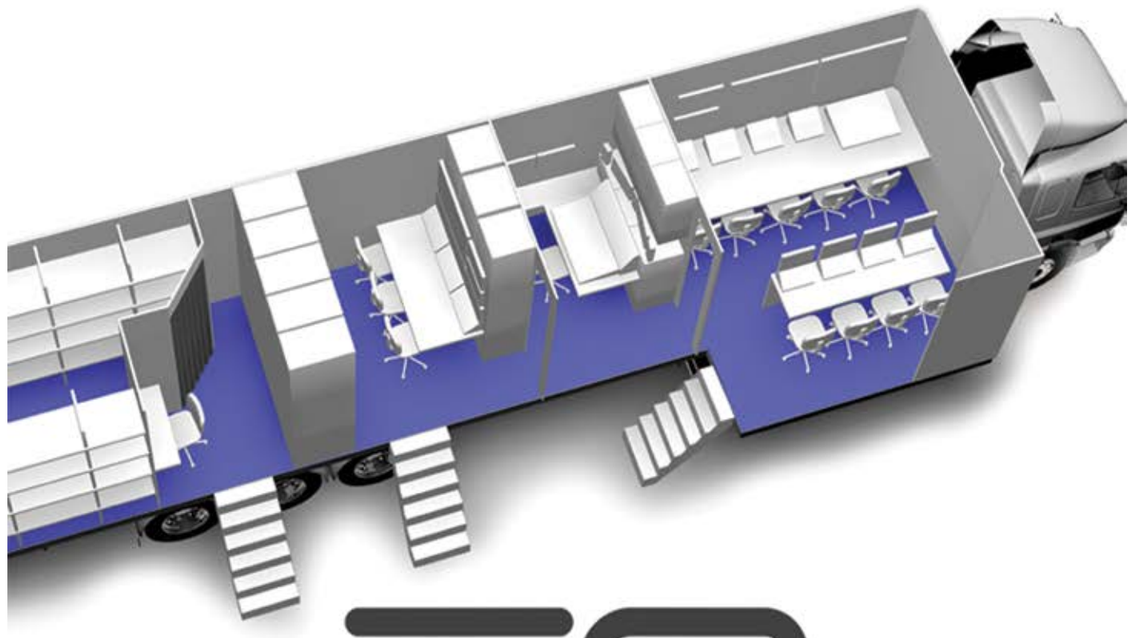
Audio Mixer: Lawo mc²56 MK2 (64 fader)
Audio Matrix: Miranda NV8576 Hybrid Router MADI & AES3
Audio Monitoring: Genelec, 5.1 Surround Sound
Microphones from Sennheiser, Crown and Sony

Intercom/Communication

Matrix: Riedel Artist 192 x 192
18 ext. Panel Ports

Power Required

2 x 90A Marachelle inlet
90kW Total AC via 3 x 30kW Chilled Water Plants



CONTENTS

HUNAN TV

LIVE PORTRAIT

Hunan TV UHD

OB Van

General Contact

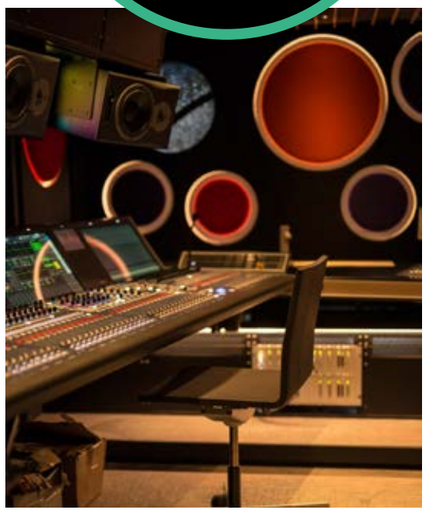
Hunan TV presented by
Sony Professional China

701 Citychamp Building
No.12 Tai Yang Gong Zhong Lu
ChaoYang District
100028 Beijing
China

Hui Du
Solutions Manager

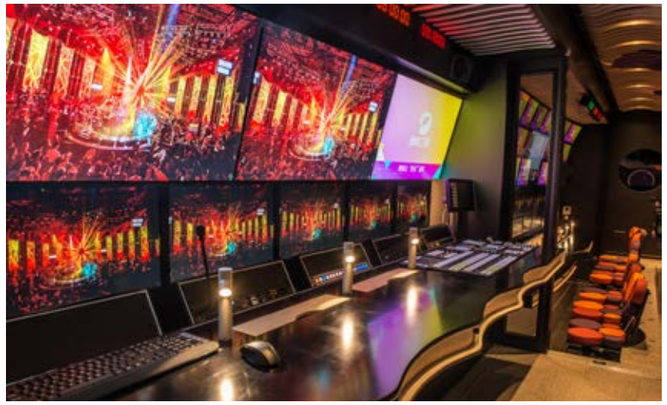
Tel: +86 10 8458 6279

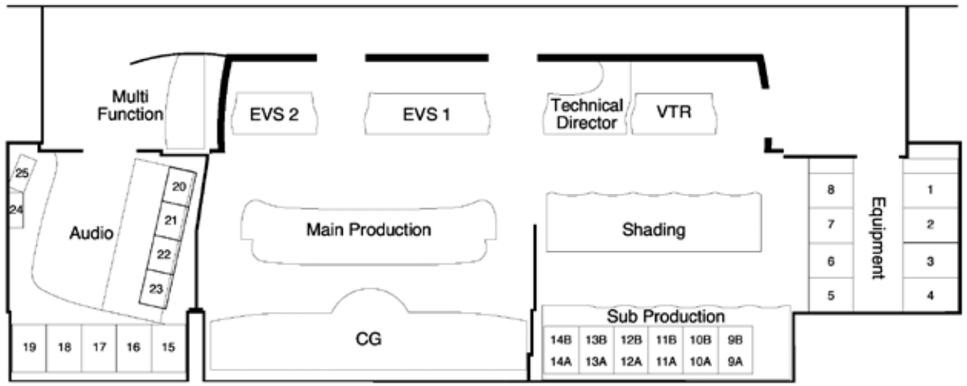
Hui.du@sony.com.cn
http://www.pro.sony.com.cn/



The new generation of flagship OB van

The new generation of flagship OB van of Hunan TV was exhibited ceremoniously in Beijing at the CCBN exhibition on March 2016 with brand new design goes beyond the tradition when many audiences who had attended IBC2015 still remembered its debut in Amsterdam.





TECHNICAL SYNOPSIS

Hunan TV UHD

OB Van

The body of HD outside broadcast van is designed by Belgium company Projectbuilders, and tractor head is Sweden SCANIA G400 6 x 2. The semitrailer body is produced by Dutch Carrosserie Akkermans BV, adopting inside and outside pull box structure on both sides. The air conditioning system adopts DAIKIN system, with 70KW refrigerating capacity.

Maximized space application design: side pull box size reaches 2m x 12.7m and 1m x 11.5m. When finishing, it adopts 3D space collision avoidance technology, breaking through the depth limit of live side pull box.

Independent corridor design: side pull box is specially designed with a 0.68m wide independent corridor, separating the workspace from personnel activity area, which not only avoids the interference on the staff entering and leaving, but also improves sound insulation and heat preservation performance in work area.

Side pull box sinking design: through 0.4m sinking design of part of side pull box floor in director area, the TV wall can be elevated to 1.6m, breaking the limit of traditional OB van height on the size of TV wall.

Ergonomic design: in order to improve comfort, every station is elaborately designed by designers, with full consideration to station function and workers' use habits, thus creating the monitoring wall arc layout which can broaden vision, suspending work table, and comfortable seats.

Sci-tech design: use KVM to flexibly dispatch various work platforms, and optimize work layout of professional production to the maximum extent.

The van is produced by Sony, while its concept design is put forward and planned independently by Hunan TV. The highlight of artistic space inherits outside broadcast van production vision system with creative concept of "Happy China" as core and breaks through the traditional cognition to outside broadcast van. With monitoring wall arc layout which can broaden vision, suspending working table, comfortable seats and happy atmosphere, its subtlety can be seen everywhere, greatly stimulating the work enthusiasm of producers.

Equipment Specifications Hunan TV

With 20+4 channel production capacity and 4K for HD special application,
With 20 sets of Sony HDC-2580 HD cameras, 2 sets of PMW-F55 4K camera (support 4K camera shooting, 4K/HD fusion splicing, HD virtual screenshots, HD 4x/6x high-speed slow motion) and 2 sets of ultra-high speed cameras, all cameras are equipped with Canon lenses
Sony MVS-7000X Switcher with Sony's new ICP-7000X panel(1*4ME, 1*2ME panel),
Main matrix uses Evertz EQX16-G-H(198x270), and spare matrix uses XE4-H(64x64),
Monitor of Sony PVM-A250, LMD-A240,
4 sets of Sony HDW-D1800 VCRs,
Server uses a set of Sony PWS-4400, 2 sets of EVS XT3 (12ch series), which can be expended to 4 sets ,
Intercom system uses 2 sets of Riedel MFR-064,
In audio, the main mixer is Lawo MC256, spare mixer is DM1000 and supports 5.1 ,
System management uses VSM.

CONTENTS

Patchpanels

Production Area

Vision Mixer and Monitor Wall

Camera Shading Area

JSBC

SloMo Desk

Sound Area

VSM Control Panel

JSBC

LIVE PORTRAIT

JSBC 4K

OB Van

General Contact

Jiangsu Broadcasting Corporation

No. 4 East Beijing Road
Nanjing
Jiangsu
China

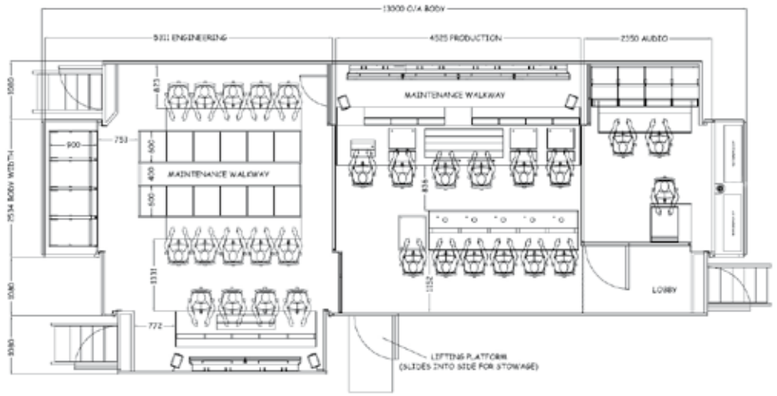
Wu Yinglu

Tel: +86 25 8318 8187

info@jstv.com
www.jstv.com/jsbc_en/

One of the most influential media operators in Jiangsu and in China

JSBC is striving to become a highly acclaimed mainstream media operator as well as an internationally well-known media outlet incorporating comprehensive media services, such as television channels, radio frequencies, newspapers, magazines and Internet products. Moreover, JSBC is turning herself into a leading provider of news, culture and entertainment content as well as a top provincial-level broadcasting network in China. Established in June 2001 out of merger and acquisition, the 3,400-employee Jiangsu Broadcasting Corporation (Group) or JSBC, adopts matrix management supervising eight administration departments, eight business sectors and five subordinate units.



TECHNICAL SYNOPSIS

JSBC 4K

OB Van

Triple Expando: 13,6m Long, 4m High, 2,5m Wide – Expands to 5,7m
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

Video

16 Sony HDC-4300 4K/UHD/SSMO and HDC-2580 Cameras
4 Sony PVW-F55 Cameras with CA-4000
Lenses from Fujinon, UA80 x 9 UHD, 99 x 8, 77 x 9.5
Wireless Camera Adaptors from Vislink
Heavy Duty Tripods from Sachtler
4K Production: Vision Mixer: Sony MVS-7000X 4ME
Monitor Wall 2x Sony PVM-X300, 6x Sony PVM-A250
Evertz Multiviewer VIPX
HD Production: Sony MVS-7000X 3ME
Monitor Wall 8x Soiny LMD 42”
Evertz Multiviewer VIPA
2x EVS XT3 6 Ch Full Editing Replay Servers
10Gb, 3Gbs SDTI, and GigE Network
EVS XFile with USB 3.0
Digital Glue from Evertz
Video Controller: Lawo VSM
Video Matrix: Evertz XE 128 x 128
Sync and Measurement: Tektronix SPG-8000 and WFM-5250

Audio

Audio Mixer: Lawo mc²66 MKII
Backup Mixer: Yamaha DM1000
Audio Matrix: Lawo Core with Dallis Frames
RTW TM7 Audio Scope
Audio Monitoring: Genelec, 5.1 Surround Sound

Intercom/Communication

Matrix: Riedel Artist 64 x 64
Wireless Talk-Back: Motorola with RiFace

Coach Builder

ASGB

System Integrator

Sony Professional Solutions China

Production Area

Underwater with MiniJib

MEDIAPRO

LIVE PORTRAIT

B39 4K/HD

OB Van

General Contact

Mediapro Portugal

Travessa da Fonte de Cima nº 2
Asseiceira Grande
2665-618 Venda do Pinheiro
Portugal

www.medialuso.pt

Mediapro

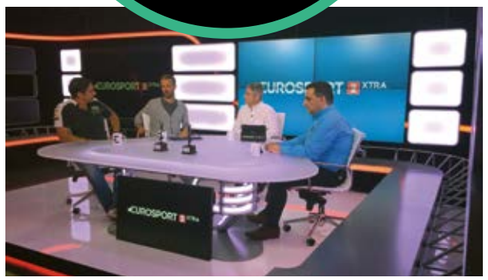
Edifici IMAGINA
Centre Audiovisual
Avinguda Diagonal 177
08018 Barcelona
Spain

www.mediapro.es

Person in Charge
Francisco de La Fuente

T: +351 21 831 06 80

@: fjfr@medialuso.tv



Mediapro in the vanguard of technical television production

With 44 OBvans (4K, HD-SDI and SD), 60 SNGs (HD and SD), over 400 cameras HD and 50 cameras 4K, special cameras (including 4SkyCam, minicams, track-cams, cranes, underwater, ultra SSM,...), RF systems, Fly Pack systems, satellite FlyAways and full studios services (Decors, Lighting, Technical services,...), Mediapro production facilities are in the forefront of the technical production. Mediapro's specialized and experienced technicians guarantee the delivery of high-quality services. Mediapro is accustomed to large-scale productions in different countries, having more than 21 offices / production sites spread across Europe, Africa, Asia, North America and South America. Mediapro offers extraordinary and "Taylor-made" technical solutions.

Production Area

MEDIAPRO

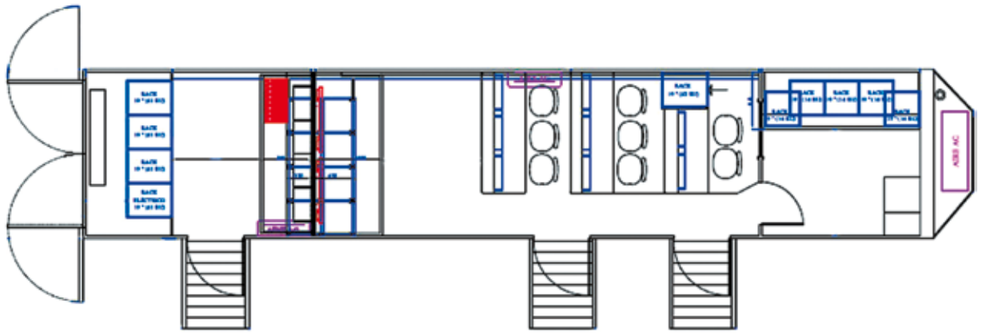
Omnicam

Gyroflex on Helicopter

HiMotion

Panasonic 4k Camera

4skyCam



TECHNICAL SYNOPSIS

B39 4K/HD

OB Van

Double Expando: 14m Long, 4m High, 2,55m Wide
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

Video

- 8 Panasonic AK-UC3000 ESMP 4K Cameras
- 1 HiMotion OmniCam
- Lenses from Canon and Fujinon
- Heavy Duty Tripods from Vinten
- Vision Mixer: SAM Kahuna 9600 with Maverik Keyboard
- Monitors in Production Area from Sony and Kroma
- Miranda Multiviewer
- Monitors in Camera Shading Area from Sony and Kroma
- Up to 4 VTRs
- 4x EVS XT3 12 Ch Full Editing Replay Servers
- 10Gb, 3Gbs SDTI, and GigE Network
- EVS XFile with USB 3.0
- LG Monitors for Replay Desks
- Digital Glue from SAM and Lawo
- Video Matrix: SAM 72 x 72

Audio

- Audio Mixer: Studer Vista 1 (24 fader)
- 32Mic/Line IN, 32 Line OUT, 8 AES IN/OUT, 2 MADI Ports
- Audio Monitoring: Genelec, 5.1 Surround Sound
- Audio Effects: TC Electronic M6000

Intercom/Communication

- Matrix: RTS Zeus III 32 x 32

Power Required

- 60kva / AC Input 63A 3P+N+T

CONTENTS

MOBILE TV GROUP

LIVE PORTRAIT

MTVG 39 Flex

OB Van

General Contact

Mobile TV Group

8455 Highfield Parkway
Englewood
CO 80112
United States of America

Nick Garvin
Director of Business Development

Tel: +1 720-573-6562

ngarvin@mobiletvgroup.com
www.mobiletvgroup.com

Established in 1994

Mobile TV Group is celebrating its 22nd anniversary with continued dedication to technological innovation, customer service, maintenance, and competitive pricing. The company was initially launched as Mountain Mobile TV (in Colorado), then added Lone Star mobile (in Texas), Western Mobile TV, and eventually combined operations into Mobile TV Group (MTVG). In 2016 MTVG released 39 Flex, the first all 4K production unit in the U.S. MTVG is privately owned.

Production Area

Sound Area

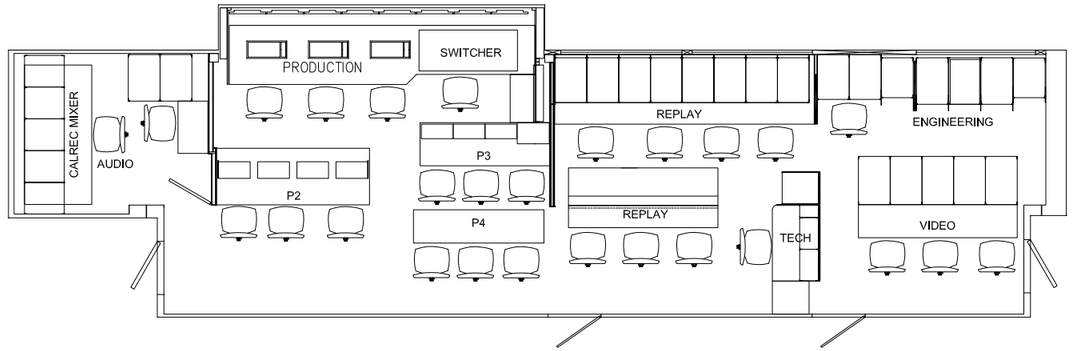
Camera Shading Area

Mobile TV Group

SloMo Desk

HDC-4300 Cameras

39 Flex Exterior with two cameras



TECHNICAL SYNOPSIS

MTVG 39 Flex

OB Van

Double Expando: 53' Long, 13'3" High, 8'6" Wide – Expands to 16'
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

Video

- 12 Sony HDC-4300 4K/UHD/SSMO Cameras with HDR (Fiber)
- 12 SMPTE to Singlemode Converters (SHEDS)
- Lenses from Fujinon, UA80 x 9 UHD, 99 x 8, 77 x 9.5
- 4 HH ENG viewfinders
- 8 Hard Camera Sleds w/ 7" OLED VF's
- Heavy Duty Tripods from Vinten and Mathews
- Vision Mixer: Grass Valley HD/4K Kayenne K-Frame Switcher 7M/Es
- 123 Monitors in production wall
- Character Generator: Chyron HyperX^3 or VizRT
- Monitors in Production Area from Sony
- Monitors in Camera Shading Area from Sony
- 5x EVS XT3 12 Ch Full Editing Replay Servers
- One of the 12 Ch XT3's can be used for Spotbox
- 10Gb, 3Gbs SDTI, and GigE Network
- EVS XFile with USB 3.0
- Digital Glue from Evertz
- Video Matrix: Evertz EQX 576 x 828 3G/4K Router

Audio

- Audio Mixer: Calrec Artemis 'Beam' Audio Mixer (56 fader)
- 256 routable inputs via MADI, 64 analog inputs
- Audio Matrix: Evertz EQX 9,216 x 18,432
- RTW TM7 Audio Scope
- Audio Monitoring: Genelec, 5.1 Surround Sound
- Audio Multi-track: Digicart EX w/SD Card Drive
- Microphones from Sennheiser, Crown and Sony

Intercom/Communication

- Matrix: RTS ADAM 96 x 96 w/OMNEO
- Studio Technologies IFB System
- RTS 4020 IFB Beltpacks
- RTS BP325 Headset Boxes
- RTS TIFF 2000
- Telos Hx2 Digital Telephone Interefaces
- Two-Way Radios with two Base Stations

Power Required

- 208 VAC, three phase, 200amps

NEP AUSTRALIA

LIVE PORTRAIT

NEP HD12

OB Van

General Contact

NEP Australia

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

Andy Armstrong
Director of Sales

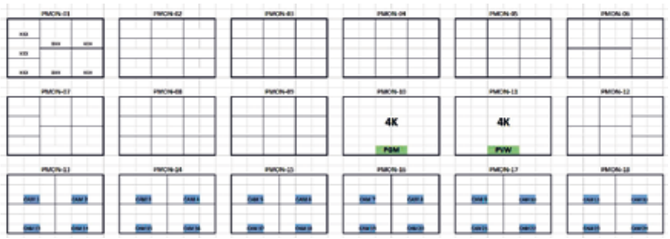
Tel: +61 2 96908080

aarmstrong@nepinc.com
www.nepinc.com

HD12 is the company's second purpose-built 4K outside broadcast vehicle and the first to launch from the active Victorian market.

It is equal in size, technical capabilities and work environment to HD11, which NEP launched in August of last year. HD11 and HD12 are unmatched by any other mobile production facilities in Australia. They are equipped with Sony's HDC4300 4K and high-speed camera technology, bringing to 50 the number of these camera units in NEP's fleet. Initially based in Melbourne, HD12 will service productions around Australia including major live sport and outside studio broadcasts. HD13 and HD14 will launch early next year, ready for the 2017 AFL and NRL seasons, and further enhancing the NEP Australia fleet. Each truck creates 65m2 of internal space, 34 seats, 9 Rec/Replay, 7 CCU, 2 TD/BE, 3 Audio, 13 Production Gallery

Production Area



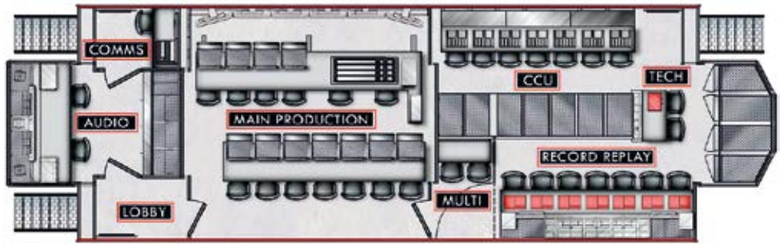
Monitor Wall

Equipment Racks

Sound Area

SloMo / Replay Area

Camera Shading Area



Double Expando: 14,9m Long, 4,3m High, 2,5m Wide – Expands to 4,7m
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

TECHNICAL SYNOPSIS

NEP HD12

OB Van

Video

- Up to 28 Sony HDC-4300 4K/UHD/SSMO with HDR (Fiber) plus POV camera options
- Lemo SMPTE Fibre
- Lenses from Canon
- Heavy Duty Tripods from Vinten
- Vision Mixer: Sony MVS-8000X 1080p, 4ME 2nd generation panel
- Boland Monitors in production wall Imagine SX Pro Multi-Viewer
- Character Generator: Chyron HyperX^3 or VizRT available
- Monitors in Production Area from Boland
- Monitors in Camera Shading Area from Sony
- 10x EVS XT3 12 Ch 900G Drives
- 10Gb, 3Gbs SDTI, and GigE Network
- EVS XFile with USB 3.0
- Digital Glue from Ross, Lawo, Extreme
- Video Controller: Lawo VSM (Virtual Studio Manager)
- Video Matrix: Imagine IP3 Hybrid 504 x 824
- KVM Devices: IHSE Draco Tera Compact
- Measurement: Tektronix WFM 8300 + WFM 5000

Audio

- Audio Mixer: Lawo mc^{2}56 (64 fader)
- Lawo Nova Router and five remote Stage Boxes via fiber
- RTW TM7 Audio Scope
- Audio Monitoring: Genelec, 5.1 Surround Sound
- Audio Multi-track: Spot On
- Microphones from Sennheiser
- Audio Effects: TC Electronics System 6000

Intercom/Communication

- Matrix: Riedel Artist 192 x 192
- Kenwood Radios
- Comrex Hybrid Digital Telephone Interefaces

Coach builder

- Smith Great Bentley UK

System Integration

- NEP Australia System Integration Team

NEP GERMANY

LIVE PORTRAIT

HD34K

OB Van

General Contact

NEP Germany

Am Nordring 26
80807 München
Germany

Andreas Baumann
Senior Sales Manager

Tel: +49 89 244 16 4021

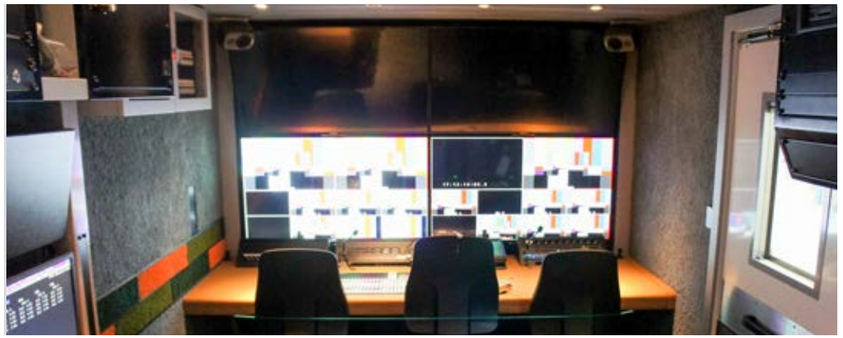
kontakt@nep-germany.de
www.nep-germany.de

Premiere content producers across the broadcast and live events industries turn to NEP to help them bring entertainment to life.

NEP provides the technology and know-how that enables clients to capture and display productions on any platform around the world. For more than 30 years, NEP has been delivering solutions for remote production, studio production, video display, host broadcasting, post production, and creative technology/IP services that set the global industry standard. With operations around globe, NEP is everywhere you need to be, with the experience and resources to make your broadcast or event a success.

CONTENTS

Production Area



Sound Area

Camera Shading Area

Camera Shading Area

SloMo Desk

TECHNICAL SYNOPSIS

HD34K

OB Van

Box Body: 7,9m Long, 2,3m High, 2,5m Wide
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

Video

- 10 Grass Valley LDX86 Universe and 2 Bradley HDC150
- Connectors: Lemo SMPTE 311 Fiber
- Lenses from Canon
- Heavy Duty Tripods from Sachtler
- Vision Mixer:
  Grass Valley HD/4K Karrera K-Frame Switcher 3 UHD ME/Es
- Character Generator: NEP self-built
- Monitors in Production Area from Sony 4x 49" and NEC 4x 23"
- Monitors in Camera Shading Area from BON 4x 21"
- Multiviewer/Splitter Imagine Platinum SX Pro
- Recording Devices Sony PDW-HD1500 and AJA KiPro Ultra
- 2x EVS XT3 12 Ch Full Editing Replay Servers
- 10Gb, 3Gbs SDTI, and GigE Network
- Digital Glue from Lynx, Imagine and Riedel (Micron)
- Video Controller: Lawo VSM
- Video Matrix: Imagine Platinum 128 x 128
- KVM Devices: Guntermann & Drunck
- Measurement: Phabrix QX, Tektronix WMV 5200

Audio

- Audio Mixer: Lawo mc²36 (24 fader)
- Audio Matrix: DirectOut 1024 x 1024
- RTW TM7 Audio Scope
- Audio Monitoring:
  Genelec, 5.1 Surround Sound
- Audio Multi-track: Ableton
- Audio Effects: TC-M6000
- Microphones from Sennheiser, beyerdynamic, Bartlett

Intercom/Communication

- Matrix: Riedel Artist 64 x 64
- Riedel/Motorola Radios
- Riedel MediorNet Stageboxes
- AVT Digital Telephone Interefaces

Coach Builder and System Integrator

- Broadcast Solutions GmbH

NEP SWITZERLAND

LIVE PORTRAIT

Ultra HD 41

OB Van

General Contact

NEP Broadcast Services Switzerland

Lindenstr. 2
8604 Volketswil
Swiss

Reto Osterwalder
Managing Director

Tel: +41 71 388 00 50

reto.osterwalder@nepgroup.com
www.nepswitzerland.ch/

Premiere content producers across the broadcast and live events industries turn to NEP to help them bring entertainment to life.

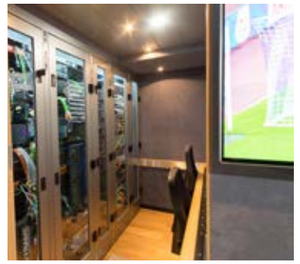
NEP provides the technology and know-how that enables clients to capture and display productions on any platform around the world. For more than 30 years, NEP has been delivering solutions for remote production, studio production, video display, host broadcasting, post production, and creative technology/IP services that set the global industry standard. With operations around globe, NEP is everywhere you need to be, with the experience and resources to make your broadcast or event a success.

CONTENTS

Production Area

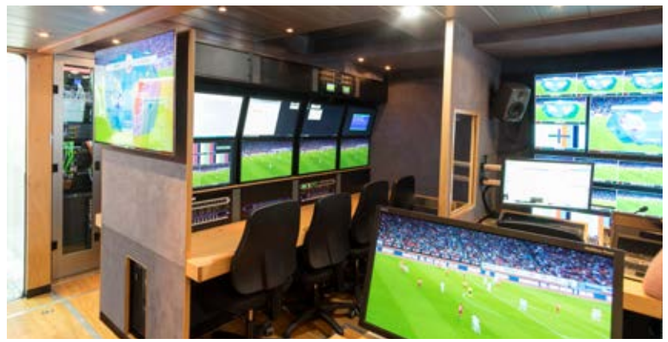
Vision Mixer and Monitor Wall

Sound Area



Equipment Racks

SloMo Area



Camera Shading Area

Single Expando: 13,6m Long, 3,9m High, 2,55m Wide Expands to 3,75m
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

TECHNICAL SYNOPSIS

Ultra HD 41

OB Van

Video

- 10 Panasonic AK-UC3000
- Connectors: Lemo SMPTE 311 Fiber
- Lenses from Canon
- Heavy Duty Tripods from Sachtler
- Vision Mixer: Grass Valley
- Karrera K-Frame Switcher 8 ME 24in x 12out
- Character Generator: NOVO II UHD
- Monitors in Production Area:
  6x 64" NEC, 12x 23" NEC, Sony UHD Monitors
- Monitors in Camera Shading Area:
  3x Sony 17", 1x BON 21", 4x NEC 23"
- Multiviewer/Splitter Imagine Platinum SX Pro 144 x 21
- Recording Devices Sony PDW-HD1500 and AJA KiPro Ultra
- 4x EVS XT3 4K Full Editing Replay Servers
  with 2x EVS Epsio Paint, 1x EVS XFile3
- 10Gb, 3Gbs SDTI, and GigE Network
- Digital Glue from Lynx, Imagine and Riedel (Micron)
- Video Controller: Lawo VSM
- Video Matrix: Imagine Platinum 256 x 328
- KVM Devices: Guntermann & Drunck
- Measurement: Phabrix QX, Tektronix WMV 5200

Audio

- Audio Mixer: Lawo mc²56 (48 Faders)
- Audio Matrix: Lawo Nova 73 5120 x 5120
- Measurement: RTW TM7 Audio Scope and Sonifex
- Audio Monitoring: Genelec, 5.1 Surround Sound
- Audio Multi-track: Ableton
- Audio Effects: TCM 6000
- Microphones from Sennheiser, Audio Technica, Rode

Intercom/Communication

- Matrix: Riedel Artist 128 x 128
- Riedel/Motorola Radios
- Riedel MediorNet Stageboxes
- AVT Digital Telephone Interefaces

Coach Builder and System Integrator

- Broadcast Solutions GmbH

NEP UK

LIVE
PORTRAIT

Pacific

OB Van

General Contact

NEP Broadcast Services UK

Venture House, Arlington Square
Bracknell, Berkshire
RG12 1WA
United Kingdom

Jo Adams
Sales and Marketing Manager

Tel: +44 1344 356 743

jadams@nepgroup.com
www.nepinc.com

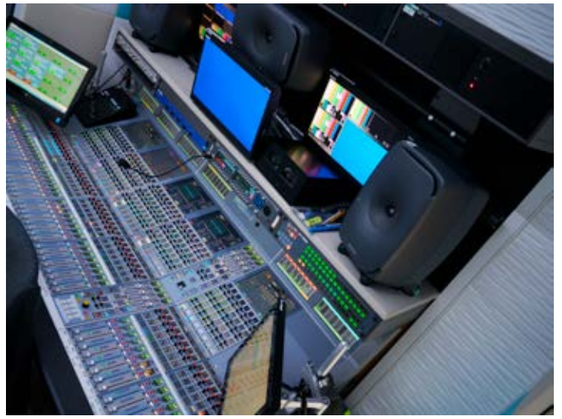
NEP UK has 30 years of experience in covering the World's premier events.

Ranging from being host broadcaster for The Royal Wedding in 2011 to providing HD fly-packs in Kazakhstan, NEP UK has distinguished itself as one of the leading Outside Broadcast providers in the world. Specializing in the latest technological solutions coupled with experienced delivery crew and project management, NEP UK has an extensive range of production facilities with a full in-house technical development and support crew to back it up.

The NEP UK fleet is equipped with the latest remote and mobile production options and can be available anywhere in the world.

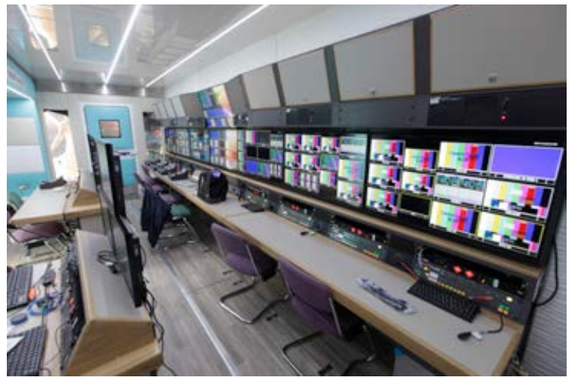
Production Area

Vision Mixer and Monitor Wall

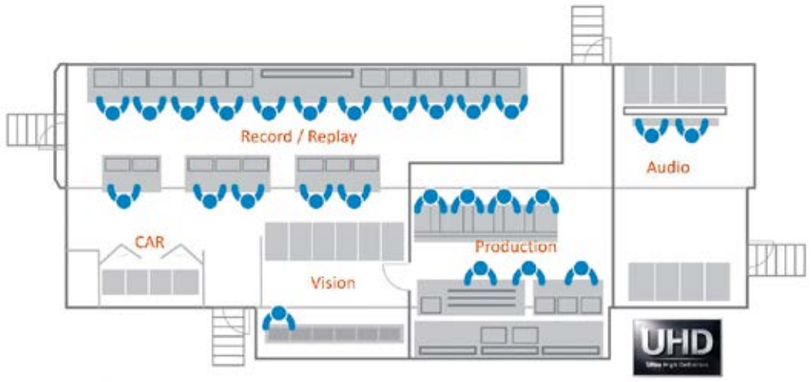


Sound Area

SloMo Desk



Total View Pacific



TECHNICAL SYNOPSIS

Pacific

OB Van

Double Expando:14,3m Long, 4m High, 2,5m Wide – Expands to 5m
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

Video

- Up to 30 Sony HDC-4300 4K/UHD/SSMO Cameras
- Lenses from Canon
- Heavy Duty Tripods from Vinten
- Vision Mixer: SAM Kahuna 9600 6MEs 120 Inputs
- 63 Monitors in production wall
- Up to 4 Recording Devices on Customer Request
- 12x EVS XT3 12 Ch Full Editing Replay Servers
- 10Gb, 3Gbs SDTI, and GigE Network
- EVS XFile with USB 3.0
- Digital Glue from Evertz
- Video Matrix: Imagine IP3 192 x 380

Audio

- Audio Mixer: Calrec Apollo (56 fader)
- Audio Matrix: Imagine IP3 3500 x 3500
- Audio Monitoring: Genelec, 5.1 Surround Sound
- Audio Effects: TC Electronic M6000
- Audio Multi-track: Digicart EX w/SD Card Drive
- Microphones from Sennheiser

Intercom/Communication

- Matrix: RTS ADAM 240 x 240
- RTS 4020 IFB Beltpacks
- RTS TIFF 2000
- Glennsound Digital Telephone Interfaces

Power Required

- 208 VAC, three phase, 200amps

CONTENTS

Center stage at the world's largest events.

HYBRID IP ROUTING

Platinum™ IP3

HYBRID IP MONITORING

EPIC™ MV

UNCOMPRESSED-OVER-IP TRANSPORT

Selenio™ MCP3

HYBRID IP CONTROL

Magellan™ SDN Orchestrator

Production facilities delivering the world's iconic sports moments rely on Imagine Communications technology to make their businesses more agile, productive and cost efficient.

Robust routers ensure no game-time downtime. Intuitive control enables on-the-fly, on-air reconfiguration. Low-latency multiviewers deliver rock-bottom frame delay. And next-gen tools like HEVC encoding of UHD, live event streaming, J2K remote production and SMPTE 2022 video over IP prepare fast-paced environments for whatever comes next.

The industry's leading sports production facilities run on our Live Production solutions.

Imagine COMMUNICATIONS™

Find out more.
imaginecommunications.com/Live-Production

TELEGENIC

LIVE PORTRAIT

T25

OB Van

General Contact

Telegenic

4 The Merlin Centre, Lancaster Road
High Wycombe, Bucks
HP12 3QL
United Kingdom

Eamon Curtin
Commercial Director

Tel: +4441494 557 400

info@telegenic.co.uk
www.telegenic.co.uk

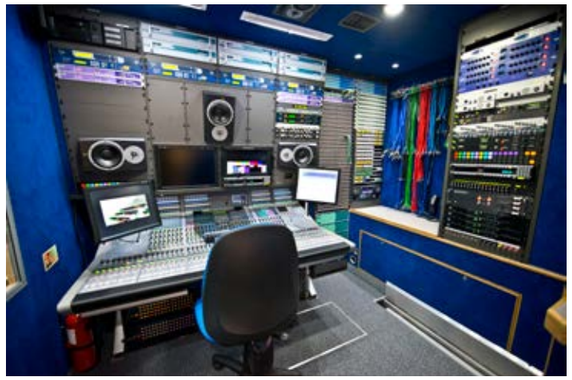
The latest editon to Telegenic's advanced fleet is the T25, a large triple expanding High Definition 2D/3D/4k scanner.

Built to the highest specification, T25 incorporates the most advanced Ultra High Definition infrastructure, capable of meeting the requirements for 4 x 1080 50P/60P with 11.1 audio, within a 3G infrastructure. T25 is designed to capture live footage in HD or 4K, supporting two unique formats out of the same truck, and is underpinned by Sony's existing product portfolio which includes HDC-4300 cameras, PMW-F55 4K cameras, CA and BPU 4K adapters and Sony PVM-X300 4K LCD monitors. To deliver a reliable 4K production workflow Miranda routers such as the 4K/UHDTV enhanced NVISION 8500 Series are optimized with SMPTE RP-168-compliant, quad-link 3 Gb/s switching that provides coherent, synchronized switching of all 4K links during the same vertical interval.

Production Area

TELEGENICHD

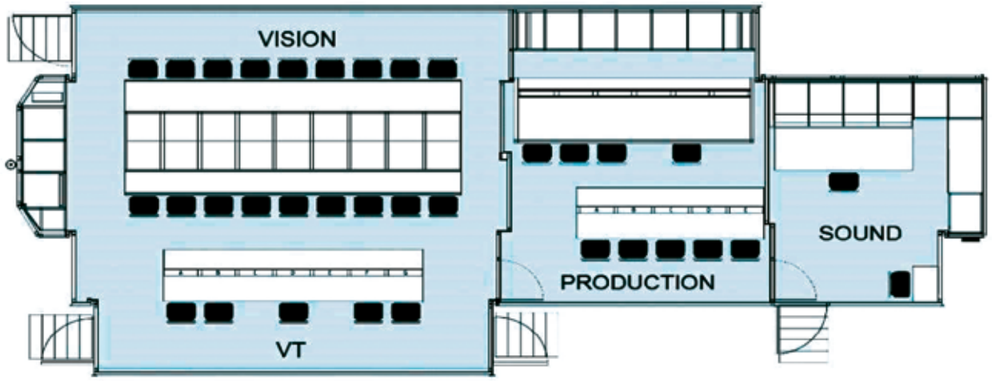
Sound Area



SloMo Desk

Camera Shading

NBA Global Games



TECHNICAL SYNOPSIS

T25

OB Van

Double Expando:
16,5m Long, 4,2m High, 2,5m Wide – Expands to 6m
Shifts between 4K/UHD+HDR |
Super SloMo | 1080p | 1080i | 720p

Video

- Sony HDC-4300 4K/UHD/SSMO Cameras with HDR (Fiber)
- Sony F55 Live Camera Systems
- Fiber Connectors from Lemo
- Lenses from Canon and Fujinon
- Heavy Duty Tripods from Vinten
- Vision Mixer: SAM Kahuna Mixer 9600 4K
- Character Generator: Chyron HyperX³ or VizRT
- Monitors in Production Area from Sony (3x PVM-X300) and Vutrix
- Multiviewers/Splitters from Evertz
- OLED Monitors in Camera Shading Area from Sony
- 18+ EVS XT3 12 Ch / GV K2 / Sony PWS-4500 Full Editing Replay Servers
- 10Gb, 3Gbs SDTI, and GigE Network
- EVS XFile with USB 3.0
- Digital Glue from Axon
- Video Controller: Lawo VSM
- Video Matrix: NVision 8500 4K/UHDTV Router
- Measurement: Tektronix WFM Series

Audio

- Audio Mixer: Calrec Apollo with Bluefin2 (48 fader)
- Audio Matrix: Calrec Hydra2
- RTW TM7 Audio Scope
- Audio Monitoring: Dynaudio Air, 11.1 Encoding and Monitoring
- Audio Multi-track: Mars and Reaper
- Audio Effects: TC Electronics M6000
- Microphones from Sennheiser, Shoeps

Intercom/Communication

- Matrix: RTS ADAM
- RTS 4020 IFB Beltpacks
- RTS BP325 Headset Boxes
- Tait DMR Radios

System Integrator

- Sony Professional Solutions

TIMELINE\TV

LIVE
PORTRAIT

UHD1

OB Van

General Contact

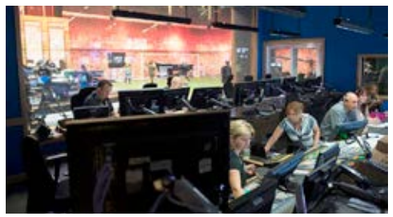
Timeline Television Ltd.

Ealing Studios, Ealing Green
London
W5 5EP
United Kingdom

Martin Bailey

Tel: +44 8450 944 445

info@timeline.tv
www.timeline.tv



Timeline Television has designed and built the first purpose built Ultra HD 4K (UHD1) outside broadcast unit in Europe.

In conjunction with BT Sport this represents a significant investment in this brand new technology. UHD1 launched in August 2015 and is available for hire for both sporting events and other production genres such as the arts, entertainment and natural history. This cutting edge Outside Broadcast unit, built by Timeline's System Integration division, is designed from the ground up to deliver Ultra HD 4K programs to the same high standard as current HD programs for complex live or as live production.

CONTENTS

Production Area

Monitor Wall

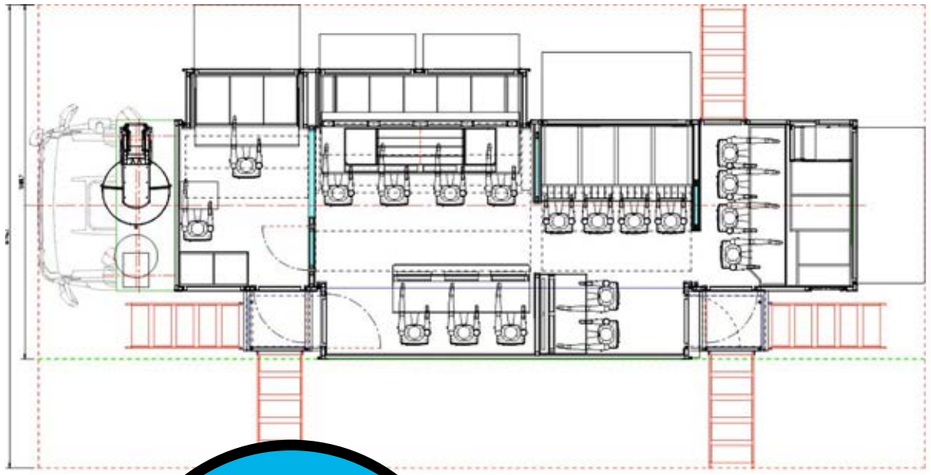
Broadcast Anywhere
Timeline\TV

Camera Shading Area

Sound Area

HDC-4300 Cameras

Production Area



TECHNICAL SYNOPSIS

UHD1

OB Van

Double Expando: 12m Long, 4,1m High, 2,5m Wide – Expands to 6,8m
Shifts between 4K/UHD | Super SloMo | 1080p | 1080i | 720p

Video

- 12 Sony HDC-4300 4K/UHD/SSM Bi-Motion Cameras
- Lenses from Fujinon, UA80, UA22
- Heavy Duty Tripods from Vinten
- Vision Mixer: SAM Kahuna UHD 4K Maverik
- 16 Sony Monitors with Grass Valley Multi-Viewer
- Character Generator: 2x 4K GFX Machines
- Monitors in Production Area from Sony
- Monitors in Camera Shading Area from Sony
- 4x EVS XT4K & 1x EVS XT3
- 2x Sony PWS-4400 & AJA Ki Pro Ultra
- 10Gb, 3Gbs SDTI, and GigE Network
- EVS XFile with USB 3.0
- Digital Glue from Axon
- System Control: Axon Cerebrum
- Video Matrix: SAM Sirius
- Measurment Equipment: Tektronix WVR8300

Audio

- Audio Mixer: Calrec Artemis (40 faders)
- Calrec Hydra2
- Audio Effects: SPX2000
- Audio Monitoring: Dynaudio
- Audio Multi-track: Spot On
- Microphones from Sennheiser
- Radio Mics/IEMs

Intercom/Communication

- Matrix: Riedel Artist 128 x 128
- Tait Duplex Basesets
- Motorola GP340 Radios

Special Features

- UHD Satellite Uplink
- UHD Drone Camera

Power Required

- 230 Volt, three phase, 63amps

TOPVISION

LIVE PORTRAIT

Ü2

OB Van

General Contact

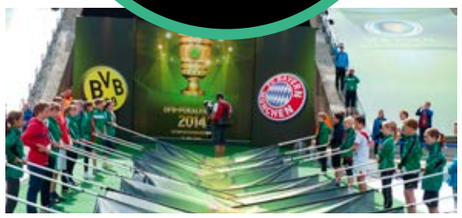
TopVision Telekommunikation
GmbH & Co. KG

Landfliegerstr. 1
12487 Berlin
Germany

Achim Jendges
CEO

Tel: +49 30 6705 200

jendges@topvision.tv
www.topvision.tv



For more than 20 years, the Berlin-based private technology service provider has been in a league of its own when it comes to the live production of sports events and live shows.

The service provider was already playing a pioneering role when HD and stereo 3D were first introduced, and it is the TopVision OB trucks that provide the images for the German Bundesliga, the Champions League and various other international football matches. In April 2014, on behalf of pay TV broadcaster Sky Deutschland, TopVision successfully delivered the world's first UHD live transmission of an entire football match (FC Bayern vs. SV Werder Bremen). The real "stress test" ultimately came last year when the UEFA Champions League Final was broadcast in 4K from the Olympic Stadium in Berlin. In addition to major sports events, TopVision is also setting a high benchmark for the production of music events in 4K resolution. The company's achievements include the world's first live transmission of a concert in 4K: In collaboration with Music-Delight Productions GmbH, TopVision broadcast the Linkin Park concert live and in June produced the Magic Show of the Ehrlich Brothers in 4K.

CONTENTS

Production Area 1 & 2

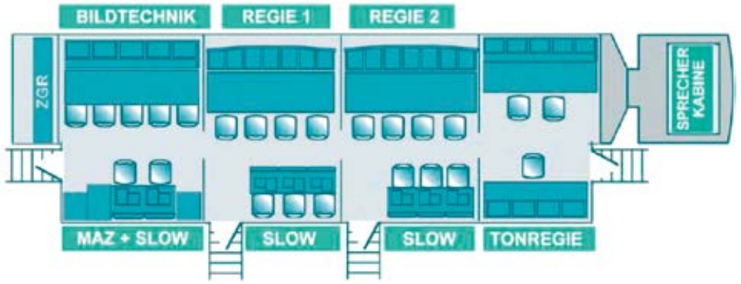
Camera Shading

SloMo Desk with Sony PVW-4400

Sound Area

HDC-4300

PVW-F55



TECHNICAL SYNOPSIS

Ü2

OB Van

Double Expando: 16,5m Long, 4m High, 2,50m Wide – Expands to 4,25m
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

Video

8 Sony HDC-4300 4K/UHD/SSMO Cameras, 12 PMW-F55,
6 GoPro Hero4 integration in 4K Workflow
or a combination of 30 HD Sony HDC-1500 / HDC-2500 / HDC 3300 Cameras
Cable Connectors: Lemo SMPTE Fibre
Lenses from Canon
Heavy Duty Tripods from Vinten and Sachtler
Vision Mixer: 2x Sony XVS-8000X with MVE-9000
Character Generator: Vizrt Trio
Monitors Production Area 1+2: 8x Sony PVM 25" and 120x Marshall 10" and BVM-X300 30" OLED 4K
Multiviewer/Splitter: Kaleido X from Miranda
Monitors Camera Shading Area: 6x Sony 20" LMD,
5x Sony 25" PVM
16 Slots for VTRs available
2x Sony PVW-4400 Full Editing Replay Servers
8x EVS XT3 8 Ch Full Editing Replay Servers
10Gb, 3Gbs SDTI, and GigE Network
Digital Glue from Lynx
Video Controller: BFE KSC
Video Matrix: Miranda 512 x 1024
KVM Devices: Guntermann & Drunck
Measurement: Tektronix WFM-5000, WVR-7120

Audio

Audio Mixer: Stagetec Aurus
Audio Matrix: Stagetec Nexus Star
Audio Monitoring: Adam 5.1 Surround Sound
Audio Multi-track: Steinberg Nuendo
Microphones from Sennheiser, Neumann, Schoeps, DPA

Intercom/Communication

Matrix: Riedel Artist 240 x 240
Wireless Talkback: Motorola with RiFace
Riedel Connect Duo ISDN Codec

System Integrator

BFE

TV SKYLINE

LIVE PORTRAIT

Ü8

OB Van

General Contact

TV Skyline Film- und
Fernsehgesellschaft mbH

Sophie-Christ-Str. 4
55127 Mainz

Wolfgang Reeh
Managing Director

+49 6131 333 770

office@tv-skyline.de
www.tv-skyline.de

TV Skyline is an innovative service provider for television and broadcasting located in Mainz.

The HD/UHD OB-van fleet is equipped with the latest and highest-quality broadcast technology. For over 20 years, TV Skyline realizes productions at the highest level in the fields of sport, entertainment, music, events and industry. In addition, TV Skyline is one of the world's leading developer and manufacturer of specialty cameras. A separate studio operations and capacities in the field of digitization and post-production completes the service portfolio. On all platforms, worldwide, since 1991: TV Skyline is the innovative provider of television and broadcasting. The products developed by TV skyline are unique in the world and are manufactured in-house. The strengths of the cameras and tracking systems are based on continuous developments through resulting needs and experiences in practice.

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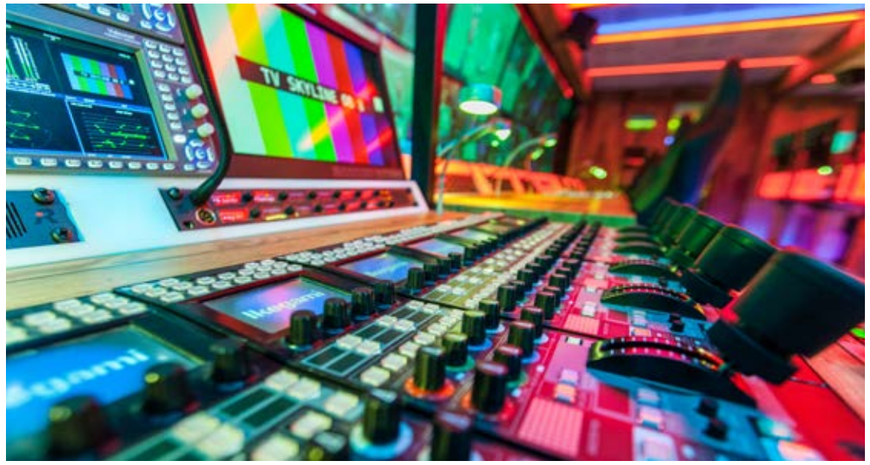
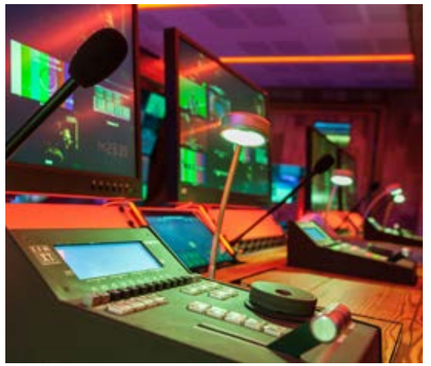


Camera Shading

SKYLINE TELEVISION

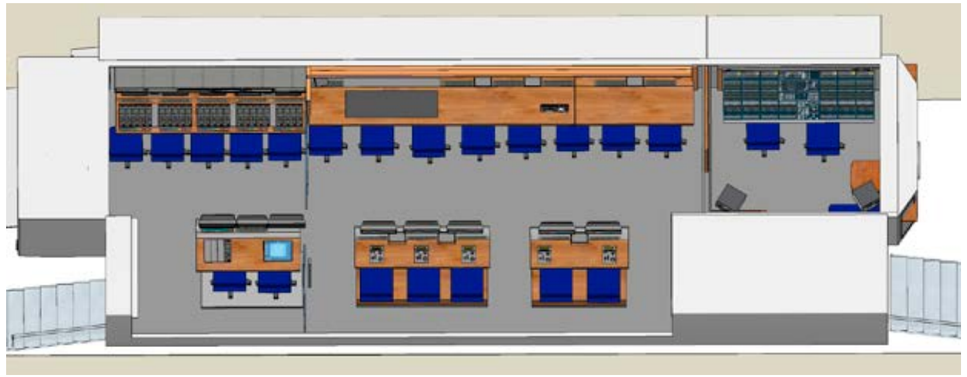
SloMo Desk



Sound Area

Vision Mixer and Monitor Wall

Inside View



Double Expando: 16,5m Long, 4m High, 2,55m Wide – Expands to 4,60m
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

TECHNICAL SYNOPSIS

Ü8

OB Van

Video

up to 20 Grass Valley LDX-86 N Cameras
or 30 HD Ikegami HDK-97A/ HDK-970A Cameras
also available in HD:
4 NAC Hi-Motion II UltraSloMo Cameras
Lenses from Canon and Fujinon
Heavy Duty Tripods from Vinten
Vision Mixer: SAM Kahuns 9600 with Maverick 2 Control Panels
Monitors Production Area 10x 48" and 5x 28" 4K Displays
Multiviewer/Splitter: Kaleido MX from Miranda
Monitors Camera Shading Area:
3x EVS Access Server
8x EVS XT3 12 Ch Full Editing Replay Servers
10Gb, 3Gbs SDTI, and GigE Network
Digital Glue from Imagine and Miranda
Video Controller: Lawo VSM
Video Matrix: Miranda NVision 8576 576 x 1152
KVM Devices: IHSE Draco
Measurement: Tektronix

Audio

Audio Mixer: Lawo mc256 MKII (56 Faders)
Audio Matrix: Lawo Nova 73 8192 x 8192
MADI Router: M 1k2 from DirectOut
AES/MADI Converter:
Andiamo from DirectOut
Audio Monitoring: Dynair6
5.1 Surround Sound and K+H M51 Speakers
Audio Multi-track: 2x 128 channel
Audio Effects:
TC Electronic System 6000 and DB6
Microphones from Sennheiser,
Neumann, Schoeps
Wohler Audio Controller

Intercom/Communication

Matrix: Riedel Artist M 2x 128 x 128
Wireless Talkback: Motorola with RiFace

Stageboxes

6 Stageboxes via Lemo SMPTE Fibre

TVN MOBILE PRODUCTION

LIVE PORTRAIT

TVN UE2HD

OB Van

General Contact

TVN MOBILE PRODUCTION GmbH

Wohlenbergstraße 4a
30179 Hannover
GERMANY

Wolfgang Peiss
Head of Sales

Tel: +49 511 1212 3777

wolfgang.peiss@tvn.de
www.tvn.de

Developing innovative solutions for film, TV and internet, TVN Film & TV Production has been existing for 32 years now.

One of the company`s special „trademarks" are several huge, eye-catching OB vans cruising all over Europe in order to broadcast sports, show, as well as concert events for TV and Web. Technical services for film production and TV were the main corporate objective at the time of establishment in 1984 by the Verlagsgesellschaft Madsack. Meanwhile the group incorporates seven companies offering complementary media services for film production, TV and web, thus covering the whole production process from concept to publication. The outside broadcasting fleet, designed by TVN engineers, has grown to four 40t double trucks, two satellite units plus several mobile flight case solutions.

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Vision Mixer

Monitor Wall

TVN MOBILE PRODUCTION

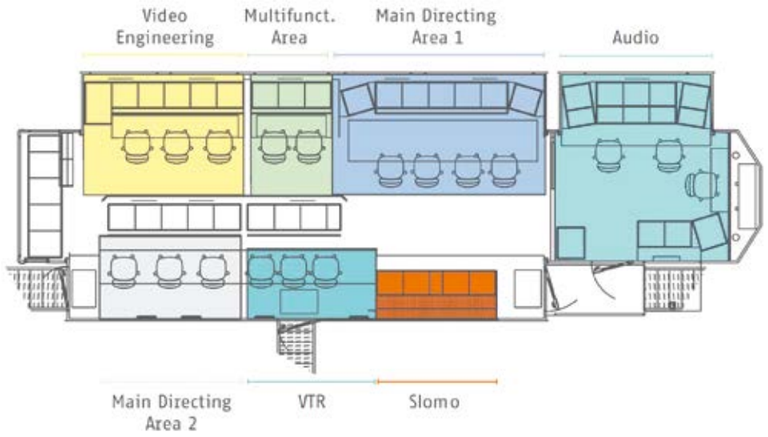
Sound Area

Production Area

SloMo Desk

Camera Shading Area

Fiber Cables



TECHNICAL SYNOPSIS

TVN UE2HD

OB Van

Equipment Specifications TVN UE2HD
Double Expando: 16,5m Long, 4m High, 2,55 Wide – Expands to 5,5m
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

Video

Sony Cameras: 4x HDC-4300, 2x HDC-3300, 6x HDC-2400, 9x HDC-1500, 2x HDC-P1
Lenses from Canon
Heavy Duty Tripods from Vinten and Sachtler
Vision Mixer: Sony MVS-8000X
Character Generator: Vizrt Dual Channel
Monitors in Production Area 1: TV Logic 6x 42", 2x 32"
Monitors in Production Area 2: TV Logic 6x 32", Sony 2x 17", 1x 24"
Multiviewer/Splitter: Miranda Kaleido, Axon Quads
6x EVS XT3 12 Ch Full Editing Replay Servers, 1x Sony PWS-4500
Digital Glue from Lynx, Axon, Miranda + Riedel MediorNet
Video Controller: Lawo VSM
Video Matrix: NVision 512 x 512
KVM Devices from Guntermann & Drunck
Measurement Equipment: Tektronix WFM-8200

Audio

Audio Mixer: Lawo mc266 (288 DSP Ch)
Lawo Nova 73HD 8196 x 8196
Audio Effects: Lexicon System 960, TC Fireworx, Teatro
Audio Monitoring: Neumann KH 120, M 51, 5.1 Surround Sound
Audio Multi-track: Steinberg Nuendo
Microphones from Sennheiser, Neumann

Intercom/Communication

Matrix: Riedel Artist 192 x 192
Motorola Radios
Mayah Centauri 3001 II Telephone Interefaces

Special Features

Set and external connections via optical fibre, up to 8 set-boxes, including Riedel MediorNet: signals, intercom units, audio (can be transmitted over considerable distances)

Coach Builder

Toutenkamion SA

System Integrator

TVN Mobile Production

VIDEOHOUSE

LIVE PORTRAIT

OB14

OB Van

General Contact

Videohouse Television Facilities

Luchthavenlaan 22
1800 Brussels

Chris Demeulemeester
mobile +32 473 40 14 40

chris.demeulemeester@videohouse.be
www.videohouse.be

For years, Videohouse has provided a unique value to the Belgian media sector.

The company was set up in 1980 and has meanwhile grown to become the facility market leader in Belgium. Nowadays, Videohouse is a member of the Euro Media Group with a presence in more than 7 countries (United Kingdom, France, Germany, The Netherlands, Belgium, Switzerland and Italy). Today, Euro Media Group is one of the few independent providers in Europe known world-wide for its technical expertise. Focused on new media, Euro Media Group is recognised for its wealth of experience in international sports, live performances and entertainment production. Offering a large range of services, advanced knowledge in technology and a strong ability to innovate, the Group provides clients with its specialist knowledge, delivering a high quality service. The Group owns the largest range of studios and mobile units, providing its customers with the greatest collection of studios and fleet of mobile facilities in Europe. As a technical integrator, the Group is active across the entire production process, handling every aspect from filming though to content delivery.

Production Area

Monitor Wall

VIDEOHOUSE
media facilities

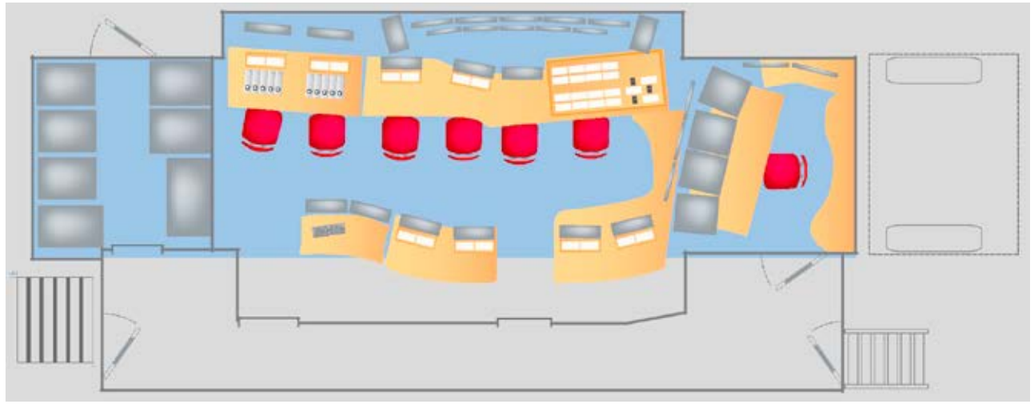
Inside View

Sound Area

Vision Mixer and Monitor Wall

Camera Shading

SloMo Desk



Double Expando: 12 Long, 4m High, 2,5m Wide – Expands to 5,1m
Shifts between 4K/UHD+HDR | Super SloMo | 1080p | 1080i | 720p

TECHNICAL SYNOPSIS

OB14

OB Van

Video

12 Sony HDC-4300
or combination of Grass Valley
LDK LDX 86 / 8300 Cameras
Lenses from Canon
Heavy Duty Tripods from Vinten
Vision Mixer: Grass Valley K-Frame 2ME+PP, 8 Chromakeys, 10ch RAM and 6 Keyers/ME
Monitors Production Area 10x Penta 24" and 12x Penta 17"
Multiviewer/Splitter: Axon
Monitors Camera Shading Area:
Ikegami HLM-1750WR Grade 1
3x VTR Positions
3x EVS XT3 12 Ch Full Editing Replay Servers
10Gb, 3Gbs SDTI, and GigE Network
Digital Glue: Axon Synapse, BroaMan Fiber Interfaces
Video Controller: Lawo VSM
Video Matrix: Miranda NVision 8280 144 x 288
KVM Devices: IHSE Draco
Measurement: Tektronix

Audio

Audio Mixer: Lawo mc256 MKII (56 Faders)
Audio Monitoring: Dynair15 5.1 Surround Sound with 2x Auratone
Audio Effects: TC Electronic System 6000, Lexicon 480, Cedar DNS8, MaxxBCI, Dan Dugan 14chAES
Multitrack Recording: SpotOn on MADI 64ch
Microphones from Sennheiser, Neumann, Schoeps

Intercom/Communication

Matrix: Riedel Artist M 2x 128 x 128
Wireless Talkback: Telex BTR-800
or Overline
Wireless Radios: Motorola
Prodys Pronto ISDN Codec

Stageboxes

3 Stageboxes on Ravenna Quadcon Fibre

Systemintegrator

PROJECTBUILDERS

HELLO

CONTENTS

ONLY EMBRACE

2

Two high profile and very different examples of show lighting.

ROBE

for Adele's "Hello" and Armin van Buuren's "Armin Only Embrace"

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ROBE ***was one of the first manufacturers to start producing multi-purpose or hybrid fixtures with the launch of The Pointe in 2013, followed by its signature BMFL range of fixtures, the first of which hit the market in September 2014.***

Both BMFLs and Pointes being seen on a wide variety of tours, shows and events worldwide ... they are being specified by leading lighting, visual and show designers and invested in by rental companies of all sizes. Here we look at two recent high profile and very different examples of shows featuring these 'workhorse' moving lights. The first is Adele's 'Hello' world tour which utilises many BMFLs in an elegant and interesting stage presentation, underscoring her position as a global singing superstar of our time. A complete contrast is the launch of Armin van Buuren's incredible 'Armin Only Embrace' world tour, which kicked off at the Amsterdam Ziggo Dome, combining the aesthetics of EDM and theatre into high impact visual presentation to support his incredible 4 hour musical extravaganza which explores trance in the context of so many other musical genres ... with a little help from a large number of Robe Pointes!

Adele ***Photos: Ralph Larmann***

Saying Hello to Adele

Nearly 100 Robe BMFL Spots toured with multi-award winning chart-topping singer / songwriter Adele's 'Adele Live 2016' world tour, in a stylish and dramatic lighting concept developed by Patrick Woodroffe working with associate lighting designer Adam Basset from design practice Woodroffe Bassett Design (WBD). The extensive tour, which garnered huge critical acclaim, followed the release of Adele's record-smashing third studio album, 25, in November 2015 which established her as one of the most successful recording artists of all time.

Lighting operator / director on the road was Roland Greil and the equipment for the UK and European legs of the tour was supplied by west London based rental specialist, Neg Earth, with Upstaging delivering the rig in the US. The rig included 90 x BMFL Spots attached on a series of symmetrical overhead LX trusses above the A-stage, with another four units deployed on trusses above the B-stage out in the middle of the audience. They provided the main backlight and profile effects and were utilised extensively through the set for theatrical mood-setting as well as potent, edgy, back-light looks, and were chosen as an appropriate high powered profile fixture to fulfil this element of the design.

Patrick worked closely with creative director set designer Es Devlin and video content producer Lizzie Pocock from Treatment on crafting the show's elegant visuality. "It was clear from the beginning that this was to be a stylish, timeless show with much of the dynamic coming from the video content," explained Patrick. A unique aesthetic for the tour was evolved over a three month period that preceded production rehearsals at Wembley Arena, during which time they - Adele herself and her creative team - were engaged in several high profile TV and Awards events including The Grammy's and The Brits, plus a TV special at Radio City Music Hall in New York.

"We decided to make a statement by not using any saturated colour in the show," says Patrick, a technique applied right to the end with the exception of a single cue - in red - during Skyfall, which had incredible impact and emotional intensity. The set featured an unusual V-shaped stage front accentuated with an internally lit lighting frame. A series of gauzes and screens flew in and out across different planes working either together or individually to vary the depth and dimensions of the performance space. The B stage in the centre of the auditorium is also surrounded with gauzes that magically appear and disappear as the set unfolds ... together with the much talked about four sided rain curtain, which was a big hit with the press! Roland operated the lights using a grandMA2 full size console which he programmed during production rehearsals and joining him on the road were lighting crew chief Chris Davis and systems tech Luke Radin, who are contracted by production for the whole tour. For the European legs, Neg Earth provided Jim Mills on dimmers and lighting techs Jamie Gorman, James Frederickson and Sarah Janebrink.

Patrick has enjoyed many aspects of this project including the developing relationship that the whole creative team has enjoyed with the artist. "She's direct, very clear about what she wants, always collaborative, totally unaffected ... and very funny. The creative period was a joy for all of us involved," he concluded.

Embracing Armin

DJ, music producer and international superstar Armin van Buuren launched his new 'Armin Only' spectacular at Amsterdam Ziggo Dome – Armin Only Embrace – once again uniting the hugely talented technical and creative team that delivered the 'Armin Only - Intense' world tour in 2014.

Central to the energy, excitement and emotion of the 4 hour trance extravaganza in Amsterdam were 162 Robe moving lights – a megamix of Pointes, LEDWash 600s and LEDBeam 100s – among other fixtures crafted into the visual landscape.

Embrace is another truly unique and imaginative immersive musical, visual and sonic experience from the "State of Trance" originator. Based on the new album and its multiplicity of sounds, he and special guests - including impresario jazz trumpeter Eric Vloeimans, rock band Kensington, singers from other musical genres and eight dancers - will stun and amaze fans worldwide.

Armin van Buuren ***Photos: Louise Stickland***

The world class production values demanded by the show ... will be supplied locally. This was one of the practical starting points for the lighting department, comprising LDs Marc Heinz and André Beekmans (The Art of Light) who created the design, and Armin's long term lighting director on-the-road, Michael Seeverens also from The Art of Light. Marc, well known for his work in the arts and theatre world - was again asked on-board by the show concept / creative director Jos Thie and AO producers ALDA to bring a theatrical vibe to the lighting. The impressive LED video screen upstage of Armin's DJ booth was based on the new Armin logo - a 'closed' version of the famous A.

Marc worked closely with André, who is founder and lead designer of Eindhoven based creative lighting & programming practice, The Art of Light, and as a design tour-de-force, they collaborated with video director Carlo Ruijgers, ambient / playback video content producers Eyesupply and stage / set designer Sander Reneman from 250K.

It was clear to see how the synergies of Marc's theatrical and Andre's EDM lighting experiences combine, compliment and played out during the show. The 74 x Pointes were dotted around on the overhead trusses and on the stage floor. Twenty-four were dedicated to highlighting scenic elements around the performance space, while the other 50 were in the grid above the stage and on the stage deck - utilized for all the super-bright, funky effects at which they excel. There was also a run of Pointes above the catwalk encasing it in an A-shaped cage at certain moments. Taking advantage of the Pointes' hybrid features, the lights were used as both beam and spot fixtures, opening up another whole round of variety. The 60 x LEDBeam 100s were rigged on six slanted vertical trusses that extended the A-shape widthways across the stage and wings. Masking the corners of the screen in keeping with the A-shape involved a perceived reduction in space, so these trusses were partly architectural in function and also allowed the fixtures to sweep out across the arena, scanning the audience and opening out the space. The LEDWash 600s lit the dancers, with eight on the trusses above the thrust / B-stage and the rest along the edges of the runway below. The breath-taking results of all these collective imaginations and the innovative mixed-media approach enthralled 34,000 fans at the Ziggo Dome over two nights, and will go on to do the same internationally as Armin and AO Embrace/s the world! Crafting the lighting design started in August 2015. As always, in addition to the creative demands, Marc and Andre considered how the show is being toured, what equipment is likely to be the most available in different territories, etc. ... and naturally, the budget!

It had to be big, bold and jaw-dropping, make huge statements, be able to support four hours of full-on banging trance performance without looking repetitive and also have the finesse to support and accentuate the different guest sections ... and ultimately still not be too complicated or over-fussy so it can work everywhere!

This is a big 'ask'.

Embrace is also about Armin being close-up and intimate with his audience. At the Ziggo Dome, a runway / B-stage thrust into the arena and much of the performance action, dancing, etc. took place on here, right in the heart of the fans.

So, with all that in mind fixture choices were influenced by what is likely to be the most available on different continents and what the first or second substitutes are likely to be. This decision alone can be the difference between spending 35 minutes or 8 hours of cloning / fixture swapping and updating the console ... before any show programming and tweaking can even start!

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Unlike Intense that was 95% indoors, around 50% of the Embrace shows will be staged outside, so the lighting design and specification needed to address this too. "We chose only the most reliable fixtures in our experience" stated Andre, "and this included the Robes".

Just as the show reveals multiple layers and depths as it unfolds, with the dancers, singers and musicians each adding new dynamic twists to the action, it was important that different areas of the stage were lit as individual spaces with their own definition. The audience is connected further by being lit and drawn into the action.

Lighting equipment for the two Ziggo Dome launch gigs and two 'sneak previews' at Brabanthallen in Den Bosch – following an intense three week production rehearsal period - was supplied by leading Dutch rental company, The Purple Group.

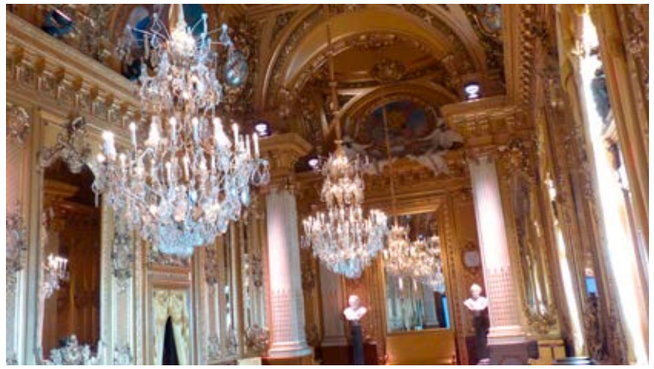
"As a DJ/producer I want to connect people to this world full of inspiring combinations. An endless universe of possibilities is waiting to be embraced. Everything is possible" says Armin ... and it seems all the ingredients are in place for another crazy year of AO touring! (visit arminonly.com)

Louise Stickland

THE ROYAL OPERA HOUSE IN STOCKHOLM

The Royal Opera House in Stockholm is the national stage for ballet and opera in Sweden. The Opera was founded in the 18th century by King Gustaf III and the first performance took place in 1773 in native language.

The Opera building is located in the heart of the Stockholm city, one of the most visited places in the country. The first Opera House was demolished in 1892 to make room for the current building that saw its first performance in 1898. The new opera is known as the Oscarian Opera or simply called *Operan*. The building is an example of a neo classical architecture and has a magnificent golden foyer and an astonishing staircase that leads to a three tier auditorium. The seating capacity of the opera house is 1200 with one box reserved exclusively for the Royal Swedish family.
Needless to say that it is very challenging to run a modern Opera with a big staff of singers, musicians and ballet dancers in an old building. Still the opera has managed very well to implement a lot of high-tech solutions in the old building in terms of lighting, stage and sound technology.



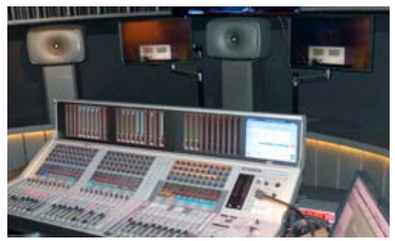
Cinema casts across Sweden and the high-end sound studio

Because Sweden is a large country, with a moderately small population, one has to travel a long distance to enjoy a performance in the Royal Opera House.
One solution to reach out to people all around the country was to create a Cinema cast. This enables people to go to their local cinema and to enjoy a La Boheme, Don Giovanni or Turandot performance in a high class direct broadcast. To be able to produce these broadcasts in the highest quality available (today High-Definition, tomorrow Ultra-High Definition) in a first step the Opera house has invested in a surround sound studio of the highest class in respect to acoustic design as well as in the choice of equipment.

The core of the studio is a Studer Vista console with a Merging Technologies Pyramix DAW attached to it. The audio monitoring is by Genelec and comprises five units of the Model 8351 coaxial three-way system with subwoofers. Lars-Göran Ehn is the senior sound engineer at the Opera House and one of the driving forces towards the implementation of new technologies. For today's Cinema Casts the Royal Opera hires HD OBVans for the video coverage and delivers the 5.1 surround sound to the OBVan. Lars-Göran has been instrumental together with chief sound engineer Tony Dickman, in putting the audio system together and they are more than pleased with the result. However there are ongoing considerations to transfer the golden foyer into a high-end video studio on the same high quality level as the sound studio. This should help to expand the performances on the stage with interviews of the singers and artists or even to produce talkshows or new types of musical performances with live transmission.

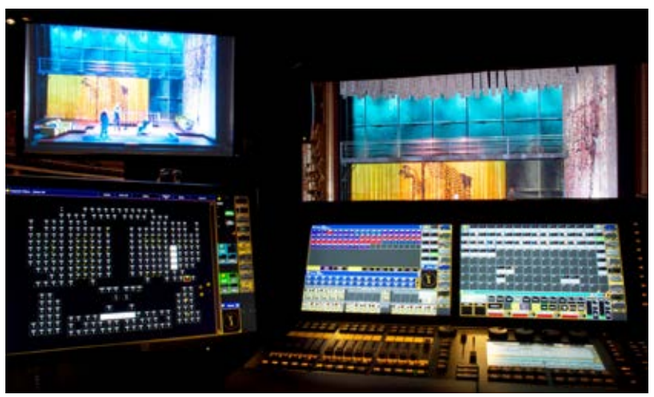
Lighting Rig and Visualization Studio

Initiated by Patrik Becker, the manager of the Lighting, Sound and Video department, the Royal Opera has performed a complete makeover of the lighting rig, which now includes a comprehensive visualization studio. The goal is clear: tedious programming shall be done off-line, shows will look better and both the Main Opera Stage and the Golden Foyer shall be virtually instantly transformable into completely diverse types of performances, including in-house live TV production and streaming.
The project manager Mikael Tham has been responsible for the system integration. The most extensive makeover of the lighting rig and control system in the history of the Royal Opera started in 2012, 30 years after the last major update back in 1982. It started with a thorough evaluation of different lighting control systems, defining and formulating the needs, both now and in the future. The result of the evaluation gave a small number of possible systems and a tender was formulated with every essential detail clearly defined and specified. The decision fell on the MA2 system and during the summer of 2013 a large control system from MA Lighting was installed by the Scandinavian representative Gobo & Highlight A/S. The systems enormous flexibility and dependability together with the integration of both video and the 3D visualization system were some of the reasons for the choice. There was also an extensive on site education package included in the original tender.



Lars Göran Ehn in the ROS Sound Studio

The MA2 system consists of four Grand MA2 lighting consoles, two of which resides in the main control room, one in the visualization studio and one is mobile unit to support shows on smaller stages and or is used on touring projects. The complete system also includes five MA onPC, two MA onPC Command Wings, four NPUs, three MA VPU Media Servers with a total of 9 outputs of full HD 1080p to feed the Barco projectors in the auditorium and on stage, and 38 fibre-connected 4-port Nodes translating from MA-Net2 to dmx in the rig. All tied together through a huge fiber optic network consisting of over 250 fibers, a large number of fiber- and network switches from Cisco and also CAT6 cabling for shorter distances.



The Visualization Studio

A purpose-built studio space for the visualization of lighting designs was included early in the planning, to help meet the demands of modern lighting and enhance workflow efficiancy. The time on stage for programming and trying things out is constantly cut shorter and the challenges presented by an almost completely new (and automated) lighting rig, both on stage and in the auditorium, needed the possibility to do qualified programming and preparations without blocking the stage. Tremendous care was taken to make the room a pleasant and inspiring space, a room where Lighting Designer, Set Designer, Directors and Choreographers could work together with Lighting Programmers and Lighting Managers and be both creative and constructive and deliver useful work.

Matthias Winther and Lars Göran Ehn

Open Air Concert

Each year the Royal Opera gives two large open air concerts. The first concert takes place in the Haga Park in Solna, just north of the Stockholm City and celebrates the Swedish National Day on the 6th of June, and the second concert takes place right in front of the actual Opera house when the whole city transforms into one big arena for the Cultural Festival of Stockholm in the end of August.
For the concert in Haga, which this year attracted an audience of 21,000 fans, the Royal Opera was relying on the complete technical support from Bright Group Stockholm to bring in a mobile stage with lighting and sound. To secure top notch sound and coverage of the 300m long summer meadow, FOH engineer Lars-Göran Ehn took help from Mattias Winther of Audile Electroacoustics for system design and tuning. Long in the planning of the concert, Winther had modelled the L'Acoustics main PA and delay towers in the Soundvision program according to the geophysical aspects of the park, and as soon as the speaker systems had been flown the system tuning was finished using the Systme measurement program and Lake processing. For mixing the Royal Swedish Orchestra and the Royal Opera Chorus, a total of over 100 musicians on stage, Ehn was relying heavily on DPA 4099 microphones to get consistent and resilient sound input from each source. For soloists and percussion he used DPA 4011 and Neumann KM140. The Chorus, for which Ehn was using Audio Technica, were partially summed prior to coming into the 96 channel inputs of the Soundcraft Vi6 console. As crowd numbers are growing, with an estimated total attendance of 27,000 people in the Park, there is a strong demand to develop a concept that includes a full camera production and large screen coverage. "After all, with the great performance of the Royal Ballet on stage, this show deserves not only to be heard but also to be seen", said Ehn.

© 2016 - Artwork by Giovanni Riva

Charles Bradley © 2016 FFJM - Lionel Flusin

THE WORLD WILL ALWAYS REMEMBER: 5.1 SURROUND SOUND FOR THE 50TH MONTREUX JAZZ FESTIVAL

For the fiftieth time, the Montreux Jazz Festival invited the international Jazz scene to the little town on Lake Geneva. This jubilee, which took place from July 1-16, was celebrated with a fully packed programme including major talents from today and yesterday. The programme reads even more like the who's who of Jazz and related genres than ever before.

It would have been a pity if these concerts could be enjoyed exclusively by the visitors on site. Of course, a selection of each year's concerts was transmitted either live through live-streaming on the festival's website (montreuxjazzfestival.com) or as a recording on Swiss broadcast networks, among other TV channels. But that's not sufficient for these high-class concerts, many of which have written Jazz history in the past. So, in addition to broadcasts, all concerts in the three main venues were also documented from start to finish in picture and sound. Since, they have been recorded in the highest quality at the time and are now inscribed in the UNESCO Memory of the World Register. This unique collection of audio-visual archives contains more than 5000 hours of live music, all fully digitized by the Metamedia Center of Ecole Polytechnique Fédérale de Lausanne (EPFL).

Since 2013, the French speaking Swiss broadcaster "Radio Television Suisse" (RTS) has been once again responsible for these recordings under the executive production and artistic direction of the festival. The broadcaster acts as a strategic service partner of the jazz festival, which specifies the recording technology, allowing the festival to keep archiving its heritage. With three of its own OB trucks and one additional, private owned audio truck, RTS recorded in all three concert halls.

Hybrid Set-up with 48 kHz and 96 kHz Audio

Best quality in video currently means HD, although RTS have already carried out tests in Ultra HD back in 2014. In audio, the state-of-the-art recordings were made at 24 bit resolution with a sample rate of 96 kHz and in 5.1 surround sound.
For the Montreux Jazz Lab, the medium sized hall for approximately 2000 people, RTS used its RTS HD1 OB truck, the flagship of its OB fleet. The sound control room, which is based on a Stage Tec AURUS mixing console and NEXUS audio router, is modified every year especially for the Montreux event. The challenge is that one part of the system still has to run at 48 kHz while the rest is switched to 96 kHz. All the audio routing which is done in stereo and 5.1, the audio distribution to the embedders and to all other applications such as the audio monitoring in the video rooms and talk back applications have to be clocked at 48 kHz whereas the live mix and multitrack archive recordings are done at 96 kHz.

Yannick Dumartineix, manager of the RTS OB Van and Studio Production, relies on a concept which has been tested and proven in recent years: "We hired an additional NEXUS STAR directly from Stage Tec in Berlin. This STAR serves as the audio router for all of the 96 kHz signals and at the same time hosts the DSP boards for the AURUS console." The NEXUS STAR needed 5 units rack space, space which is always at a premium in OB trucks. Therefore RTS temporarily removed some communication hardware to free up sufficient rack space for the STAR. The OB truck was partially rewired and modified for this production, a unique procedure for this very important recording job!
MADI connections with sample rate conversion bridged between the additional 96 kHz STAR and the 48 kHz STAR. The latter was used to record the 5.1 and stereo mixes for the video. These had to be done at 48 kHz since the embedders and some other equipment on the OB truck didn't support high-resolution audio.

New audio DSP unit

5.1 mixes in 96 kHz are highly resource-intensive. In order to meet the requirements, Stage Tec installed the latest DSP boards within the additional STAR. These DSP Platinum boards handle the AURUS console processing and offer more than twice the number of channels than their predecessors. Seven of these DSP Platinum boards made possible a console configuration with 160 input channels and 84 buses plus 54 bus channels (214 channels in total). The boards were only introduced in April 2016 at Prolight+Sound, perfect timing because they were essential for this year's Montreux recordings. "During the development of the DSP Platinum we already had applications such as this RTS production in Montreux in mind", comments Jens Kuhlmann from Stage Tec, who has supported RTS with the modifications for the Montreux Jazz Festival since 2013. "And now it was a perfectly adequate premiere that the Montreux Jazz Festival was the very first event to use the new DSP Platinum."

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A lot of Audio Expertise

Leaving aside the question of 48 or 96 kHz, the audio production was demanding. The many channels were kept as multitrack ISO recordings as well as mixed in 5.1 and in stereo. Three parallel hard disk systems were used for this purpose (Pyramix, Pro Tools and JoeCo) and guaranteed a solid backup strategy. They were interfaced via MADI switched to 96 kHz mode, which halves the MADI channel capacity. So, even more equipment was needed just to transfer the many channels to the hard disk recorders. An additional rack with vintage audio effects such as Lexicon 480L, Tube-Tech, UREI, and Maxx Bass completed the line up in the HD1 audio control room. In order to match the perceived record levels in the three halls, RTS introduced loudness management last year. Operating according to EBU R128, RTS mixed with -23 LUFS and -3 dBTP in 5.1 and stereo. For the stereo programme for mobile platforms, the standard was modified slightly to -16 LUFS and -0.5 dBTP.
Yannick Dumartineix is proud of the capabilities of RTS' HD1 and its crew "The details of the audio control room are great, regarding the acoustics as well as the quality of the desk", he explained. "We all benefit from the high quality audio and video in the truck and we have a skilled team running it. These were the prerequisites to provide services to partners like the Montreux Jazz Festival."

A complex project

While the audio control room of the HD1 was busy with recording the concerts from the Montreux Jazz Lab, its main vision control room was used to handle the seven cameras within the large Stravinski Auditorium. This hall, with an audience capacity of 4000, hosted the top acts at the Montreux Jazz Festival. An additional container sub-control room attached to the HD1 took care of the four cameras in the small Montreux Jazz Club, which offered an intimate atmosphere for around 350 jazz fans. The video recording was done on EVS servers in the HD1 sub control room. Incidentally, the recording format was an AVC-Intra MXF1080i with 16 audio channels. So in a way, the entire HD1 with all its different control rooms and sections was working for all three stages at the same time. It is complemented by the RTS HD3 which is used for the video part from the Montreux Jazz Lab, by the RTS Music +, an audio truck working at the Montreux Jazz Club and by the audio truck Le Voyageur responsible for the audio from the large Auditorium Stravinski.

Nearly all of the RTS OB trucks are designed as flexible multi-purpose vehicles. The Swiss broadcast market is way too small for highly specialised OB trucks. This flexibility might well explain why one finds so many creative recording locations in Switzerland. The Swiss crews are used to improvising and adapting their equipment to match the requirements to an even greater extent than is usual in the OB business.
The video programmes, including the audio recordings, are intended for several purposes. During the live concerts, they fed the Big Screen at the stage as well as the internal TV channel. They also served as sources for the web services, daily live-streaming of the festival's website, and were shared with the TV and radio broadcasters. Some concerts will end up on Blu-Ray, DVD or vinyl one day as a part of the Live at Montreux collection. Therefore all performances are recorded in the best way possible in order to ensure flexibility. And of course the entire content is finally saved for the future in a long-term archive for protection, enhancement and diffusion process, as part of the UNESCO Memory of the World Register.

Bertrand Siffert was the main sound engineer on HD1 during the Montreux Jazz Festival and was responsible for the artistic mixing. As from the beginning, Yves-Alain Schneider was his right hand and acted as 2nd Sound Engineer. David Weber is head of the Audio in charge at Montreux Jazz Festival. Yannick Dumartineix was involved in planning the HD1 many years ago. Today he manages the OB Van and Studio Production.

More channels and a higher packing density – these attributes of the new audio DSP unit of HD1's AURUS mixing console were crucial for the Montreux Jazz Festival recordings. The 76 buses were especially helpful in generating the many different mixes and output signals.

The Stravinski Auditorium, with an audience capacity of 4000, is by far the biggest location. All concerts from the Stravinski Auditorium were recorded by the purely audio OB truck Le Voyageur. The acts staged at the smallest location, the Montreux Jazz Club for 350 jazz fans, were recorded by the RTS Music +, also purely an audio truck. Most of the video recordings were produced in or with the help of the HD1. RTS used the video part of another truck, the RTS HD3, only for the six cameras in the Montreux Jazz Lab.

RTS Radio Télévision Suisse

EPFL ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE

STAGETEC

www.montreuxjazzfestival.com

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NEW ROUTE66 AUTOROUTER TURNS A HEAD FULL OF DREAMS INTO REALITY

Wigwam and Firehouse invest in Optocore / BroaMan devices for Coldplay tour

Having completed the design of Coldplay's all new, Wigwam built control system, digital design specialist Alex Hadjigeorgiou, along with Account Manager, Chris Hill, have taken the technical design lead for the fibre infrastructure on the band's latest trans-Atlantic tour, A Head full of Dreams.

Working alongside the band's head of audio, Tony Smith, he had already incorporated a number of Optocore devices into the DiGiCo console topology — but has now taken the journey further by embracing the new Route66 AutoRouter from start-up sister company BroaMan — the first audio consultant to do so.

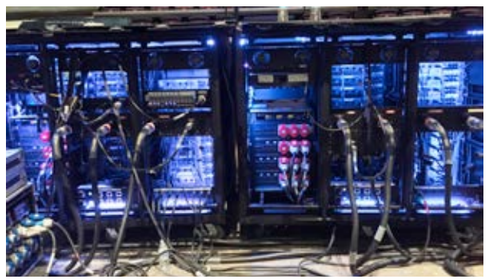
"The main objective was to design a system that would allow a d&b audiotechnik array processed system to be built in modular fashion and be scalable — as some shows require extra ring delays," explained Hadjigeorgiou.

The new Route66 AutoRouter provides a more elegant solution to the ring design. "I discussed the idea and after successfully demoing the unit, I based my initial design around it," the designer continued.

Powered by Optocore, the Route66 AutoRouter is compatible with both Optocore and DiGiCo fibre loops, enabling a redundant 'star' to be created from the advanced ring topology. Route66 automatically finds mobile and remote devices, closes the Optocore loop and switches the links automatically to establish redundancy. "Put simply, Route66 does the 'thinking' for [the sound team] when it comes to correct cable connection — and the speed of prepping a show, which allows them to work on the main system without the delays connected as part of the fibre optic ring," he continued.

The decision was also backed by Tony Smith. "We work to the spec he gives us and have developed a fantastic relationship over time, with an overall desire to deliver improvements in every evolution of the system," notes Hadjigeorgiou.

Adds Smith, "After knowing what we needed Alex has evolved a suitable solution, not only for the signals but also the durability, support and 'Plug & play' that is required on the road. To have units such as the Optioore and BroaMan, where you have that flexibility, is essential."

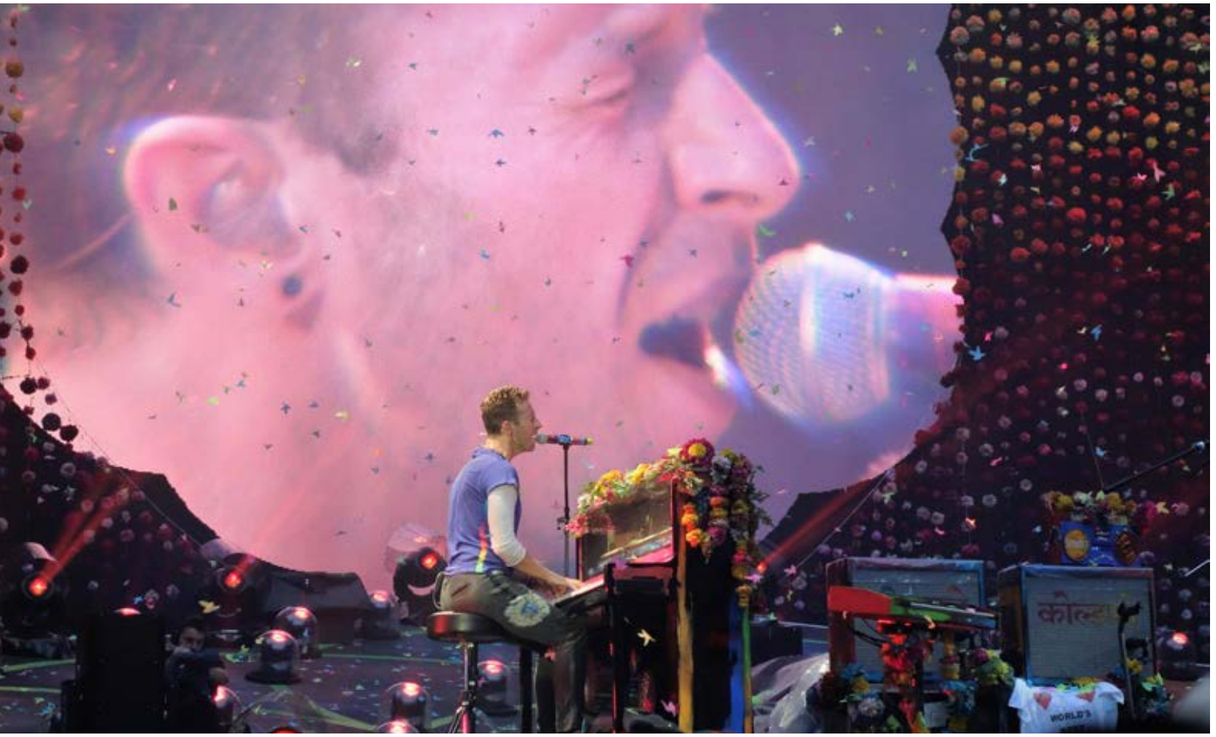


Smith, along with Wigwam crew chief, Nick Mooney, and system engineer, Jack Murphy, have also welcomed the improvements in the new design. While Wigwam successfully inducted the system in Europe, adding additional Optocore X6R-FX and X6R-TP interfaces to their existing returns racks, over in the States Firehouse Productions, responsible for the US leg, have been running a near-identical set-up after themselves investing in a raft of new Optocore devices.

These are used to distribute AES signals system wide at 96Hz with a back-up LAN network to the d&b D80 amplifiers. Optocore also handles all the clocking and sample rate conversion for the feeds from the main and support consoles at FOH.

Coldplay started a relationship with the New York-based company during the previous Ghost Stores promo shows and continued into the US promo dates prior to the A Head full of Dreams tour. Firehouse owner Bryan Olson and technical manager Chris Russo both checked the system out in the UK before agreeing to build a similar one.

"The fantastic advantage about working with Firehouse is that they were happy to replicate the design infrastructure almost identically," observed Alex Hadjigeorgiou. "This meant we could look at shipping the Route66 and other FOH control as the system front end — making a huge difference in terms of continuity."



The larger set-up, used in the UK and Europe, comprises seven nodes, each featuring at least one X6R-FX at each position (the FOH Stage right and Stage left nodes also feature an X6R-TP to allow additional I/O). The signal flow is effectively a ring system set up in a star network via the Route66. Jack Murphy is one who appreciates its flexibility. "The Route66 is great — pretty much plug and play," he confirmed. "Every day we connect the system up in a different order and this device just sorts it all out without affecting the audio at all.

"The Optocore software is generally great and the overview health-check of individual devices — seeing PSUs working / monitoring temperature etc — is really useful; also the light levels being received is great for fault finding."And for tight load-ins the Route66 means the technical team never have to wait for all devices in the system to work. "If we're pushed for time we can start on the main system and then introduce other parts systematically."

"Route66 AutoRouter is a natural progression, taking an already proven system and making it better and more flexible," concluded Alex Hadjigeorgiou. "In fact it's enabling us to move the whole system design forward even further than we thought.

"The options going forward have really opened up and I can see a situation in the future where the Route66 becomes almost ubiquitous on live touring shows."

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Photo © Ralph Larmann

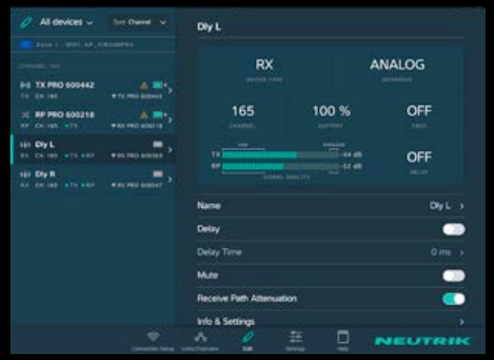
STRONGER THAN TIME

XIRIUM PRO provides rock-solid wireless audio transmission and pure sound at Udo Lindenberg's "Keine Panik! Tour 2016"

German rock titan Udo Lindenberg has started his "Keine Panik!" ("Don't panic!") 2016 German tour. Fans love the 70-year-old chart topper. More than half a million people have attended his concerts in the past three years, and in 2016 the stadiums and halls are packed again! It was not surprising that, in the run-up to the tour, an additional concert had to be scheduled at almost every venue.
satis&fy, leading international provider of cutting-edge event, media technology and scenic design solutions from Karben near Frankfurt am Main, Germany, was responsible for the sound on Udo Lindenberg's "Keine Panik! Tour 2016." The company is international in scope, employing over 500 people. satis&fy's fleet of vehicles and store of materials is one of the biggest and most up to date of German live event companies.
To keep on top of state-of-the-art technology, satis&fy and the freelance sound engineer Arnd Wagner tested the new wireless solution XIRIUM PRO from Neutrik. The test took place during two concerts in June 2016 in the TUI Arena in Hannover, Germany. The arena holds up to 14,000 spectators. Neutrik's new professional wireless system XIRIUM PRO is based on Neutrik's DiWA (Digital Wireless Audio)

technology, offering sample-accurate operation in the license-free 5 GHz ISM band. The 5 GHz band offers DiWA ample bandwidth to transmit excellent, uncompressed audio (24 bit / 48 kHz) of such high quality as to bear comparison with wired cable transmission over distances of greater than 500 meters from one transmitter to an unlimited number of receivers (point-to-multiple-point). Even with high RF traffic, Neutrik's DiWA protocol guarantees uninterrupted data transmission. XIRIUM PRO provides great flexibility by offering two different base units (TX and RX) that accommodate a combination of different input and output audio modules.

There are modules for analog (line-level), digital (AES/EBU), and DANTE audio signals. Additionally, a repeater module is offered for the RX base stations. The modules can be flexibly combined, transparently and automatically converting amongst the various audio signal types.
Sound engineer Arnd Wagner has accompanied Udo Lindenberg on his tours, together with satis&fy, since 2008. On the first tour in 2008, Arnd filled in for a sound engineer who was unable to make the job. He has been part of the team ever since. Even though Udo Lindenberg was already a superstar eight years ago, everything about his tours was smaller back then. In 2008, when Udo Lindenberg also gave a concert in the Hannover TUI Arena, the tour equipment fit into eight trailers. This year, the technical team arrived in Hannover with 22 trailers. Three of them are filled with the stage, which is shipped from one venue to the next. Another two trailers are packed with satis&fy's PA equipment. On the "Keine Panik!" tour, the event company exclusively uses loudspeakers from L-Acoustics. The maximum setup, as used in Stuttgart and Gelsenkirchen, comprises 56 K1 and 110 K2 speakers. In Hannover, the setup comprised 40 K1 and 36 K2 speakers. Such professional audio equipment requires a perfect audio signal – something which cannot be achieved with bandwidth-limited UHF systems. By contrast, XIRIUM PRO offers audio quality like a cable, with 24 bit / 48kHz sampling and a flat frequency response.
In stadiums, setting up the sound equipment for maximum impact and quality at the upper tiers is difficult. Unlike in outdoor events, using very tall speaker towers is inevitably limited by the venue's roof: stadium ceilings are designed to transfer the sounds of the upper tiers' screaming and jubilant sports fans down to the other fans and the sports team. Of course, such acoustic transfer is counterproductive for concerts. In order to achieve proper sound absorption in the upper tiers, the speakers have to "reach" into the upper tier area as far as possible, with maximum focus, in order to reduce slapback.



The XIRIUM PRO app shows the quality of the transmitted wireless signal in the TUI Arena in Hannover. The two bars show the RSSI level (Received Signal Strength Indicator). RSSI is a measure of the power level that a RF client device is receiving from the sending device. The color of the bars (green, orange or red) in turn gives information about packet loss.

That's why satis&fy uses, in addition to three line arrays on each of both longitudinal sides, two additional line arrays aimed specifically at the upper tiers, providing the best possible sound experience there. To control these amps, Ethernet cables are installed. Using IP tunneling integrated into Riedel RockNet, the control data is transferred to the amps. The IP tunneling offers only 10 Mbit transmission speed, but that is sufficient for the control data. In big stadiums, satis&fy dedicates 40 amplifiers just to the sound in the upper tiers, with all 40 amps supplied both control data and audio via a RockNet loop. However, in Hannover, the RockNet loop was used for the control data and as a redundant audio source. XIRIUM PRO was deployed as the primary audio source.
Complicating matters, Udo Lindenberg flies through stadiums and halls with a spider system during his concerts. So, preferably, no cables should come down from the towers at any points. All cables must be dressed back and away from the towers – a very cumbersome process. In such cases, a wireless system like XIRIUM PRO from Neutrik offers serious relief.
XIRIUM PRO was not completely new for Arnd as he already worked with the product's predecessors. In collaboration with Neutrik support, Arnd planned the system configuration the day before the first concert in Hannover. On the day of the concert, XIRIUM PRO setup was completed in just a few moments, showing its strength as a plug-and-play system. One XIRIUM PRO receiver was mounted to each of the two amp racks with a ManfrottoTM universal mounting clamp (which is included in the scope of XIRIUM PRO delivery). The exchangeable modules offer 10 hours of battery life, but since power was supplied onsite, the devices were powered with mains power simply by using powerCON TRUE1 equipped cables. After installation was completed, the racks and delay towers were flown up to the stadium ceiling. Once this was done, the XIRIUM PRO receivers were no longer accessible. Therefore, the directional antennas (40° H / 35° V) were properly angled towards the XIRIUM PRO transmitting unit before the rig was flown.

Photo © Ralph Larmann

The transmitter itself and one repeater unit were placed directly at the FOH position. As the receivers were located up so high, the sender and repeater units had to be mounted slightly angled on speaker stands to align to the two receivers at the ceiling. The repeater was used to create a redundant transmission line – what Neutrik calls "extended true diversity". The repeater sends the signal, minimally time shifted, on an independent RF path. Such a diversity solution is a combination of time and room/space diversity, avoiding reflection-based phase cancellations and exceeding the effectiveness of even full diversity systems. Each receiver automatically selects the best signal, switching between the transmitter and repeater signals without interruption.
The XIRIUM PRO app made it easy to optimize the wireless audio transmission. The app runs on tablets (iOS or Android) and allows remote monitoring and control of all adjustable settings during a live event. During both shows, the app confirmed the excellent signal transmission quality at any given time. The wireless audio transmission remained robust even though there were two wireless cameras operating in the 5 GHz band as well.
XIRIUM PRO is designed for static point-to-multiple-point wireless audio installations. The app can be seen as a game changer for such a controlled setup: offering more than control, it makes wireless audio transmission predictable. The software makes it a breeze to optimize aerial alignment and determine the location of the repeater. It also facilitates the setting of all function parameters (e.g. delay time, XROC mode, etc.) as well as monitoring (e.g. signal strength, battery power, etc.).
The complete sonic adjustment of the upper tier audio was made with the help of L-Acoustics' LA Network Manager software, utilizing both FIR filters and standard parametric filters. Further, LA Network Manager can adjust the so-called "zoom factor," providing additional DSP-based equalization.
Arnd also uses LA Network Manager to set delays. Here, single channels can be grouped freely as desired. XIRIUM PRO also offers the ability to set a separate delay for each receiving unit.
The path to the nearfield speakers on stage is achieved over DANTE via a LAKE LM44 processor. Onstage DANTE breakout boxes are supplied via a fiber optic system. The AES signal goes from the mixer via the fiber system to the stage and is played into the LAKE processor, which in turn sends a DANTE signal to the breakout boxes on both sides of the stage. In this way, the primary and secondary audio signals are transmitted, along with a control V-LAN signal. Parallel copper lines are laid as well, providing a redundant signal path. These copper cables transmit an analog audio signal to the left and right front amplifiers, just in case one of the DANTE breakout boxes fails. If this were to happen, the amps would automatically switch to the analog signal provided by the copper lines and apply a 3 ms delay, as defined in the amplifiers' "fallback mode" settings. Further, if there is something wrong with the sound on stage, the audio engineer can manually mark and switch any amplifiers over to the analog signal. This is the reason for the analog cabling.
Sound engineer Arnd Wagner summed up his test of Neutrik's XIRIUM PRO after two concerts in Hannover:
"The transmission with XIRIUM PRO worked perfectly – two shows without any failure! And the sound was really comparable to cable transmission. The app made a very good impression. I think it's indispensable to be able to see, in the app, if the receivers simply receive a signal or if they are all truly in the green (good) area."

NEUTRIK KEINE Panik! satis&fy the true colours of events

VIENNA VOLKSOPER: NATURAL SOUND ALL YEAR ROUND

Built in a mere ten months and inaugurated in 1898, the Vienna Volksoper is the Austrian capital's other prestigious opera house. It is what Austrians like to call a "repertory theatre", i.e. a venue that stages opera, operetta, ballet, and musical comedy productions—around 300 shows each season (September through June).

It has over 500 employees, among them an in-house orchestra, a choir, and a seven-strong audio department. Impressive though that may sound, ten-hour days are the rule for the audio engineers, and there are only a few exceptions. While opera and classic operetta productions are performed without any sound reinforcement, apart from occasional thunder, doorbell and other effects, musical comedies rely heavily on the venue's digital audio system—without anybody noticing. How is this possible?

"Our aim is to make our sound reinforcement unobtrusive," explains Andreas Hendler, assistant manager of Volksoper's Acoustic and Multimedia department. "We want the sound to remain perfectly natural, only louder in places where there is a danger of some parts being drowned out by the orchestra, for example." So far, so good, but hiding the front-of-house and other point-source speakers from the audience's view doesn't solve the problem of a soundscape lacking depth. After all, a perfectly natural acoustic experience also means that artists standing at the back sound further away, reducing their levels while adding more reverb simply doesn't do this.

This is precisely why the audio engineers at the Vienna Volksoper have become masters at "playing" with the Haas effect, i.e. the fact that the sound that reaches the listener's ear first determines its perceived spatial location. The amplified sound is delayed by a maximum of 20 milliseconds to ensure that the acoustic sound arrives before the singer's voice is heard from the speaker system.

No Spoilers, Please

Another trick that has won the audio team quite a few pats on the back from the likes of Steven Sondheim, is that Andreas Hendler and the head of department, Martin Lukesch, discovered that what really makes an amplified vocal signal sound "amplified"—and hence less natural—is the pronounced 10kHz boost of most wireless headset or ear-worn microphones. This causes sibilants to jump out of the speakers rather than the artists' mouths. Understandable though this boost may be because of the microphones' less-than-ideal placement in most instances, the audio engineers at the Vienna Volksoper have developed a way of equalising microphone signals in such a way that they appear to be the product of the singers' voices and the venue's acoustics.

It all Began with a Track Ball

When the Vienna Volksoper decided it was time for a new mixing console in 2002, it purchased two SALZBRENNER C.A.S. Mix consoles and a number of STAGE TEC Nexus Base Devices to provide the required ins and outs throughout the venue. Ten years later, the venue decided the consoles were nearing the end of their lifecycle and began dreaming about new ones. The C.A.S. Mix consoles were equipped with trackballs, and most audio engineers at the Vienna Volksoper quickly discovered how much time this saved them in their daily routine. As smartphones were becoming increasingly popular, the team put two and two together and asked SALZBRENNER media if there were any plans for a touchscreen-based digital console that did away with the limitations of other digital desks and would also enable them to save and recall parameter settings selectively. There were indeed such plans, and so the Vienna Volksoper ordered two POLARIS touch consoles.

Based on their experience with the trackball and their enthusiasm for WYSIWYG user interfaces, they provided the SALZBRENNER media team with invaluable ideas and solutions for streamlined live operation and were one of the first clients to receive their desks, which they connected to their existing Nexus infrastructure. "Working with POLARIS touch is more than three times faster than operating a conventional digital desk," explains Andreas Hendler.

Inside the Box is Outside the Box

The purchase of the trackball-equipped consoles in 2002 coincided with the construction of a new control room, designed by the Austrian acoustician Peter Willensdorfer. Despite being a separate room, the sound the audio engineers hear is identical to what the 1,300-strong audience experiences in the hall. This impression is further enhanced by the fact that the consoles are not facing the stage but rather perpendicular to it, with the two POLARIS touch consoles set up in such a way that the engineers can work back to back.

Two audio engineers? Yes, for musical comedy productions, that is how the Vienna Volksoper works: one engineer is in charge of the voices (one console), while the other mixes the orchestra, controls sound effects and cues (second console) and communicates with the engineers on stage when there is an issue with one of the 34 wireless channels.

A Day in the Life...

The Vienna Volksoper's busy schedule is only manageable because the stage set is dismantled every night to make room for rehearsals in the morning before the set for the next show is put in place. On most nights, the show differs from the one before it and the one following it. "The Sound of Music" on Tuesday night, for instance, may be followed by "Anatevka" on Wednesday, "The Wizard of Oz" on Thursday and "Così fan Tutte" on Friday. This requires flexible digital consoles, a powerful QLab system as well as digital media servers and MIDI-controllable outboard gear. Each POLARIS touch cue transmits a MIDI message to the QLab system, which then sends MIDI program changes in all directions as and when needed. That way, the entire soundscape can be changed in a split second.

New productions are prepared in a matter weeks, and wireless microphones come into play at the third or fourth piano rehearsal—singers who will be wearing hats, caps, etc., during the show have to put on "rehearsal hats" to allow the sound engineers to find the best spot for their wireless microphones.

What about the cue list? This is prepared offline at first, which takes two to three days, and is based on what the audio engineer believes will work best for the production. There are usually several alternatives to try out different approaches without keeping everybody waiting.

In addition, the "Anatevka" production uses a choir in the choir room to support the chorus on stage, which requires additional microphones. Despite all the automation options available to the audio team, the singers are still tracked manually—by the audio engineer in charge of the voices. Andreas Hendler, who usually works in tandem with Martin Lukesch, admits that keeping the voices audible and intelligible can be quite stressful at times, especially when there are a lot of singers on stage. This poses two kinds of challenge: singers facing each other may create a comb filter effect, which needs to be corrected either by lowering a fader or by explaining that the singers should avoid direct line-of-sight positions on stage; and short passages sung by several artists need to be kept in balance and perfectly audible throughout without missing so much as a syllable.

And they all need to sound natural, of course...

(alle Bilder © Volksoper Wien)

SALZBRENNER media

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PRG LIVE ENTERTAINMENT AWARD 2016

GLAMOROUS GALA EVENT IN FRANKFURT'S FESTHALLE

On 4th April 2016, the PRG Live Entertainment Awards (PRG LEA) were presented in the Festhalle in Frankfurt in front of an audience of over 1,400 guests from the national and international music, event and entertainment scenes. With a total of 14 awards, event organisers, artist managers, concert agents, venue operators and artists were recognised for their excellent achievements in the live entertainment industry. The PRG LEA gives all creative players and organisers, who contribute great ideas and extraordinary energy to the work behind the scenes, the opportunity of having acknowledged their special achievements in the entertainment industry. Only music journalists and professionals from the live entertainment sector form the expert jury who decide on nominations. Star-studded national and international live acts such as Belinda Davids, Niedeckens BAP, Santiano, Glasperlenspiel, Sophie Hunger, the symphonic-metal-newcomer Beyond the Black and twelve artists of the Circo National de Cuba, which shows parts of the Show Havana Nights delighted the many guests with their thrilling acts on the stage.

TV journalist Ingo Nommsen gave a masterful performance as moderator through this entertaining show. Amongst the many prominent and illustrious guests were Helene Fischer, Udo Lindenberg, Alexander Klaws, Gleis 8, Lotto King Karl, Orchestral Manoeuvres in the Dark and Roland Kaiser.

Climate neutral event with the "Greenest Orchestra Worldwide"

The Live Entertainment Award will be climate neutral beginning 2016 in cooperation with the First Climate AG in Frankfurt. The Berlin Show Orchestra, the "Greenest Orchestra Worldwide", presented this year the cutaway gag and interlude music live on stage and fits perfect to the climate neutral event.

LEA success story

Since its premiere in 2006 in the theatre tent of the "Fliegende Bauten" ensemble in Hamburg, the LEA has become one of the major awards of the entertainment industry in the category of ECHO and Deutscher Filmpreis in just ten years and has established itself as one of the most important German cultural awards. The stylised concert ticket – solid bronze cast weighing 3.5 kilograms – has now become a much coveted trophy in the show and event sector. The LEA nominees and award winners reflect the entire spectrum of the live show and entertainment scenes, with all their creativity, innovative ideas and success stories.

MICROPHONE TECHNOLOGY

Technology

Since 2013, beyerdynamic supports the PRG LEA as an exclusive microphone partner and supplies all required microphones to perform such a live event. In 2016 it was new that in addition to the different live acts the Berlin Show Orchestra had to be equipped with microphones as well. Altogether 38 wireless channels, 10 IEM channels and around 120 wired microphones were used. Once again beyerdynamic's microphones showed up with an impressive and reliable performance.

The challenge: Wireless microphones

To set up wireless microphones for such a big live event like the PRG LEA 2016 entails special requirements. Every single channel has to work reliably and without any disturbance all the time at every location. In times of reduced spectrum due to DVB-T and mobile radio it is a challenge to meet these requirements while offering 38 channels of wireless microphones and 16 channels of wireless In Ear Monitoring (IEM) simultaneously. beyerdynamic's TG 1000 digital wireless system was built to handle complex RF scenarios with a minimum effort. Due to its impressive bandwidth of 319 MHz it was no problem to find a frequency for each channel between all the other radio equipment. One of the bands tried to use their own wireless system with less bandwidth, but had no chance to find free channels. Therefore, they used the TG 1000 which offers the switching bandwidth for both, receiver and transmitter, and the artist were impressed by the clean and natural sound of the TG 1000 and the dynamic TG V50w capsule. All vocals of the live acts used the TG 1000 with the TG V50w capsule except one band, who wanted to use their own Beta 58c microphone head. But this was also no problem for the TG 1000, because in combination with the WA-HHA-SHBY adapter ring the artist could you use their preferred capsule with the TG 1000 handheld transmitter and therefore benefit from the same reliable and stable RF performance. This is another advantage of the TG 1000, because every sound engineer can handle special wishes of artists without having 30 different wireless systems in use. Frequency coordination with only one system is much easier to coordinate than various systems with different RF parameters.
The TG 1000 digital wireless system from beyerdynamic was again able to demonstrate its formidable performance. Especially its impressive frequency range, which offers a high level of flexibility, and the clean and natural sound makes everyone happy, artists and sound engineers.

Flexible microphone technology for moderation

In every award show there have to be presentations. Therefore, the presenter Ingo Nommsen used a TG 1000 handheld transmitter equipped with a TG V96w true condenser capsule. With this he could walk around on stage and through the audience and for interviews there was another handheld transmitter with the same capsule. Due to the high gain before feedback of this cardioid microphone head there was no problem with feedback at any place. For some special presentations which require free hands the sound engineers of the PRG decided to use the cardioid TG H74c headset with the TG 1000 beltpack transmitter. For all other presentations, the stage offered a podium equipped with two Classis GM 304 cardioid gooseneck microphones. This year another cardioid gooseneck microphone (Classis GM 302) was also in use which could automatically be hidden in the stage floor.

Microphones for live acts

The PRG LEA is the only award show in Germany which has real live acts without any playback. Furthermore, in 2016 it was the first time that the jingles were played live by the Berlin Show Orchestra. The orchestra was part of the whole show and used a wide range of beyerdynamic's live microphones. For example the brass section used the TG I57c with the TG 1000 beltpack transmitters, the guitar amp was equipped with a M88 TG and the drum sets used the TG D70d (Kick), MC 930 as overhead and the TG D58c for toms. The snare was miked with the TG D50d. For the Berlin Show Orchestra it was the first time that they used beyerdynamic microphones, but all of them loved beyerdynamic's typical natural sound.

The orchestra had their fixed places and microphone set up during the whole show. The other live acts changed and therefore a large number of microphones were in use to make the change over as easy as possible. Each live act was able to leave their backline (instruments, amplifiers, etc.) set up on risers (rolling platforms) backstage which meant that the microphones were also left on the instruments. For all vocals wireless handheld transmitters with dynamic TG V50w capsule were used. For the instruments beyerdynamic shows a wide variation of microphones for the special sound of each artist. Especially drummers are sensible regarding microphones but depending on the individual sound of the drummer there was either the dynamic TG D35d or the condenser TG D57c/TG D58c in use for toms. Furthermore, the latest addition to the drum microphone family, the TG D71c, had its crucial test in the kicks of the symphonic-metal band Beyond the Black. Everyone was surprised by the good sound of beyerdynamic's boundary with its fast attack and the smart design. Furthermore, the dynamic TG D70d large diaphragm microphone was put in the kick drum. For most microphones at the drum sets the legendary and patented MKV-87 microphone clamp was used to avoid the usage of too many microphone stands. For a good separation of the hi-hat, the hypercardioid MC 950 true condenser microphone was used. Similarly to the Berlin Show Orchestra the MC 930 was applied as an overhead microphone and the snare was miked with the TG D50d and / or M201 (snare up / snare bottom). Guitar amps were miked with the TG D50d or M160 and percussion with the MC 840 large diaphragm true condenser microphone.
Two MC 930 microphones were used as atmosphere microphones. These microphones transmit the atmosphere for the in-ear monitoring systems that the artists are using. Without them, the artists who are using IEM would not be able to hear the audience at all.
All in all, the TG 1000 digital wireless system and microphone technology from beyerdynamic was a clear winner with its ease of handling and especially its impressive sound at this technically challenging live event.

beyerdynamic

THE AWARD WINNERS 2016

ARENA/STADIUM TOUR OF THE YEAR
Winner: Helene Fischer („Farbenspiel") – Semmel Concerts Entertainment / artist management Uwe Kanthak
Laudatory speech: Arno Hartung (Olympiapark Munich) and Peter von Löbbecke (Olympiastadion Berlin)

CLUB TOUR OF THE YEAR (presented by Ströer)
Winner: Sophie Hunger („Supermoon Tour 2015") – Prime Tours & Promotion
Laudatory speech: Glasperlenspiel

FESTIVAL OF THE YEAR (presented by PRG)
Winner: Parookaville, Weeze – Parookaville Gesellschaft
Laudatory speech: Andy McCluskey and Paul Humphreys (OMD)

CONCERT OF THE YEARw
Winner: AC/DC, Red Bull Ring Spielberg, Austria – United Promoters in cooperation with LS Konzertagentur
Laudatory speech: Santiano

SHOW OF THE YEAR
Winner: „Disneys Aladdin – Das Musical" – Stage Entertainment
Laudatory speech: Alexander Klaws

CLUB OF THE YEAR
Winner: Große Freiheit 36 – MGB Musikladen Gastronomie Betriebs-Gesellschaft
Laudatory speech: Gleis 8

INDOOR CONCERT VENUE/ARENA OF THE YEAR
Winner: Stadtpark, Hamburg – Karsten Jahnke Konzertdirektion
Laudatory speech: Lotto King Karl

ARTIST MANAGER/AGENT OF THE YEAR
Winner: Nicolas Gundel – Hamburg Artist Management
Laudatory speech: Johannes Oerding

LOCAL ORGANISER OF THE YEAR
Winner: BB Promotion „The Art of Entertainment", Mannheim
Laudatory speech: Alexa Feser

EVENT ORGANISER OF THE YEAR
Winner: Dieter Semmelmann – Semmel Concerts Veranstaltungsservice, Bayreuth and Berlin
Laudatory speech: Roland Kaiser

ARTIST / YOUNG TALENT PROMOTER OF THE YEAR
Winner: Projekt „Klasse! Wir singen" – Singen e.V., Geschäftsführer: Daniel Keding
Laudatory speech: Joja Wendt

JURY AWARD
Winner: Roland „Balou" Temme – Think Big Event- & Veranstaltungsgesellschaft – and Udo Lindenberg
Laudatory speech: Wolfgang Niedecken and Peter Urban (jury speaker)

LIFE'S WORK
Winner: André Béchir (abc Production, Opfikon-Glattbrugg, Switzerland)
Laudatory speech: Carl Leighton-Pope

BRINGING MUSIC TO THE MASSES

CONTENTS

For dance music aficionados, Ultra Music Festival and its related events are global hot tickets. Billed as the world's premier electronic music festival, it attracts elite dance DJs and artists such as Martin Garrix, Har dwell, Avicii, Armin van Buuren, David Guetta, Deadmau5 and Eric Prydz who perform to thousands of people at 18 events across the world, from Croatia to Tokyo.

However, the year's biggest showcase of Ultra Music Festival takes place in Miami. With eight stages featuring the biggest names in the business, it's dance music heaven.

For those that can't be there in person – tickets sell out quickly, and travel and accommodation costs are significant – the festival provides the next best thing: a dedicated YouTube channel, UMF TV, featuring a jam packed live-stream covering performances on three stages, edited highlights from across the festival, plus studio interviews with the DJs broadcast on the Twitch platform. UMF TV has over a million subscribers, so content needs to be comprehensive, professional and exciting.

Production company NOMOBO, which specialises in live music events, is tasked with producing this web coverage for five Ultra Music Festivals each year, including the Miami event. NOMOBO has offices in the Netherlands and the United States.

Since 2015 the company has been using NewTek's 3Play platform to record, live edit and playout coverage of the event. 3Play is more often used for sports coverage, but its ability to record multiple feeds and create real-time highlights packages has proved invaluable to NOMOBO to produce its live broadcast shows for music and entertainment events.

"Producing all the live content for the Ultra Music Festival is a huge undertaking, but now that we have our workflow centred around 3Play it's so much easier," says Constantijn van Duren, founder of NOMOBO. "We have multi-camera set-ups on three of the stages and these all feed into our 3Play 4800 which is located in our MCR (Master Control Room) in the media compound. We record performances, backstage reports, artist interviews and stand-ups in 3Play, then play them out to the Ultra Live broadcast on UMF TV with a delay, as well as editing highlight clips to post later on our UMF TV video and social media channels. It's a very important solution as it allows us to continue recording while we're publishing the clips, so we don't miss anything – which is so important in live broadcasting. 3Play has quickly become the heart of our production."

As the festival evolves so does the coverage, and this year NOMOBO added a live studio set-up to ramp up the excitement, kicking off the live broadcasts on the Friday afternoon with pre-show interviews. "Backstage we had a two-camera set up where we invited the DJs to be interviewed between the performances to talk about their Ultra experiences, new albums and latest work," says Constantijn. "This set-up was also ingested into the 3Play 4800 system for isolated recording and delayed playout or publishing to multiple social media channels. We used social media a lot as another way of connecting with the audience that was not able to physically attend the event. The hashtag we used to connect with our audience began trending worldwide within minutes after we started our three-day broadcast."

Another advantage of 3Play 4800 for this event was the additional storage capacity. "We were broadcasting for 3 long days, and the 3Play 4800 unit with its 2TB storage ensured we were able to capture everything," he adds.

NOMOBO has been working with 3Play since 2015, and from the start the team found it easy to use – and to train operators. "When we first invested in the system we organised some training days for our freelance crew. The ops needed just one day to go through the features, and since then they can just work with the system – it's really easy!" says Constantijn

As well as music festivals, NOMOBO also works with corporate brands on product launches and marketing events. The company was involved in creating a 24 hour broadcast to launch the new Ford Mustang in The Netherlands, receiving live footage from several locations into the 3Play in its central Amsterdam-based MCR to provide live streaming, instant replays, highlights packages and publishing to social media channels. NOMOBO also covered the Red Bull Megaloop Challenge kite-boarding tournament from the Netherlands, making good use of 3Play's slow motion and instant replay functions as well as being able to edit packages for video on demand publishing.

"We use 3Play in any way we can think of – it gives us a recording solution, replays, slo-mo, highlights, editing, publishing - everything we need for live broadcasting," says Constantijn. "Without 3Play we'd have to work with lots of separate recording or editing equipment and have to transport them and connect them all together. With 3Play it's all available in one relatively small and light-weight system that we can ship anywhere."

Due to the international nature of its work, NOMOBO works from portable flyaway production units that can be shipped easily around the world and can be set up in small spaces with few requirements - no heavy power generators or large footprint. "If we need to produce a show at the top of a skyscraper, we can do it with compact gear like 3Play," he adds.

NOMOBO is also looking at new ways to engage and connect with their viewers, and has plans to incorporate NewTek's TalkShow live video calling system – which enables producers to add live Skype video calls into productions, with high quality video and audio and a host of production control features - into upcoming events.

"We had a great demo of TalkShow at NAB, and could immediately see the possibilities for our events," says Constantijn. "For instance, at the Ultra Music Festival we could make our live broadcasts with the artists more interactive by inviting fans to call in and talk with their heroes during their interviews. Similarly, for our corporate events, we can involve people in remote locations so that they are part of the action. It's all about engaging with that wider audience, and TalkShow will bring people that much closer to the event. It's a very exciting product."

NOMOBO prides itself on giving viewers the highest quality live and on-demand produced content, and providing its customers the best possible service, enabling them to engage with their audiences in new and exciting ways. Using tools like 3Play and TalkShow allows this growing company to keep innovating.

CONNECTED EVENTS WITH LIVECG BROADCAST

Icon Broadcast Group integrates Social Media in Festival Live Production

For the third year in a row, Icon Broadcast Group, a production company based in the Netherlands handled the live operations for VESTROCK festival, engaging the audience through social media. Conferences, sporting events, concerts, festivals, and even television shows are connected. Today's trend for live events and live video productions is to extend the audience beyond the walls of a stadium or a concert hall, beyond a studio and spread it to the largest audience possible. Engaging fans and viewers, not only on site, or those in front of their screens, but also the one watching videos on any existing device, is a new and widely used way of production.
Icon Broadcast Group, a full service audio-visual production for broadcasting, creative audiovisual productions and video productions for events, operates the live production of the VESTROCK Festival held in Hulst in the Netherlands. The event's focus is mainly about music, art & science and mixes together various kinds of music, performing arts, theater, street art, illusionists and more....a real place of expression for artists. Nominated ten times for the European Festival Awards, the number of visitors increased tenfold since the start in 2010 and keeps growing.

Connecting the Audience

When you think audience engagement, social media pops automatically in your head. What social media bring today to live productions is interactivity with the audience. You reach the audience in real time and you get an instant feedback from followers. Adding social media into a production is not that easy and generally involves high costs. LiveXpert is one of the actors in the video industry who thought about user-friendly, affordable and intuitive solutions.
Icon Broadcast Group needed a system, easy to set up, easy to dematerialized, easy to use and most importantly easy to give to use by anyone. LiveCG Broadcast is available in two versions. LiveCG Broadcast SDI connects with any video mixer and fits in all workflow configurations. LiveCG Broadcast IP connects with a NewTek TriCaster through IP connection and supports NewTek NDI protocol for complete production over IP.

LiveCG Broadcast offers an exclusive tool called Social Hub. The Social Hub is an application to be installed on an external computer, giving the ability to connect with a wide selection of social platforms, to receive feeds from them, monitor them, and send a selection of the messages to go live! Social Hub supports connection to Facebook, Twitter, Flickr, WhatsApp, Skype, Instagram, Line, RSS feeds, emails accounts and even SMS through its GSM modem. Social hub has also a connection to Open Weather Map to select which weather information per city to be displayed by LiveCG Broadcast.During VESTROCK Festival, the Social Hub was receiving RSS feeds and incoming messages from Twitter® and Instagram®. These feeds were sent live on several big LED screens on site. The LiveCG Broadcast was also used for the "Meeting Point", as a service, for broadcasting messages about children who lost their parents. Managed by the Festival's organizers themselves, messages from What'sApp® were sent directly to the big screens without the need to go though validation by the PR officers who were in charge of the Social Hub.

Mobile Production on site

The Social Hub was used in two different ways and managed by two different teams. Jan Warnier, CEO of Icon Broadcast Group, and his team did an unexpected and brilliant thing for this festival live production. "To gain space in the control room and to make the production mobile and more versatile, we used IT virtualization techniques. We virtualized several systems on one physical server, including the Social Hub, the social media management system integrated in LiveCG Broadcast." Therefore, the incoming messages from Twitter® and Instagram® were managed and sent live by people who could be located anywhere all around the venue.
Managing the messages in the Social Hub installed on a virtual machine made it possible to have the user interface available on any device and anywhere. The persons in charge of the Social Hub could manage and have a complete control over the Social Hub from any computer or any iPad, wherever they were on the festival's site. "When producing live, it's important to have everything ready before the show", says Jan Warnier "but most importantly not to be disturbed by any unexpected element during the live operation. With LiveCG Broadcast, my graphics and the social media interface were completely independent from my video mixer." On another "virtual machine" they installed an android Operating system with WhatsApp® application to receive text messages from the lost and found meeting point. Programming the Social Hub, along with other applications on a virtual machine, made all these applications accessible out of the OB van, on any device, even on an iPad, from anywhere, in the Festival PR office or on the field.

Live Production over the Network

LiveCG Broadcast, is also a multi-layer graphic generator from the LiveXpert line of products. It is a powerful system in a 1U rack with a dedicated interface to generate all kinds of graphics, crawlers, banners... to implement into a live production. "Another advantage of LiveCG Broadcast is that you can do your graphics and text during live production without interfering with it. You don't work on the system, you work on the network!" The graphic elements in LiveCG Broadcast are called from a simple Excel spreadsheet making it so much easier to manage live production content, as it can be changed without interfering with the live production operations. For the VESTROCK festival, Icon Broadcast Group used a NewTek TriCaster 8000, the most powerful system of the TriCaster ProLine. The TriCaster was the centerpiece of the control room of the festival's live production. The video mixer was receiving feeds from 12 cameras, including IP camera's installed above the stage to shoot scenes from the top. Jan concludes that "Being able to work on the graphics, to make last minute changes, and connect with social media, without interfering with your live operations, and do all that over the network, these are just a few key points that make LiveCG Broadcast a professional tool, available at a consumer price!"
Yes, Icon Broadcast Group has got some special skills and expertise in IT. Dematerializing LiveCG Broadcast made the system more versatile and easily adaptable to the festival's needs. In the end it gave to thousands of remote fans the opportunity to join the crowd on site, and be a complete part of the VESTROCK festival.

Icon Broadcast Group
www.iconbroadcastgroup.com/

www.vestrock.nl/

TAKING BROADCAST PRODUCTION

ON THE ROAD

Cologne based Filmwerk has been a leading player in television, digital media, corporate and commercials for more than two decades and has worked on some some of Germany's most watched television programs, including "Supertalent" and "Kleines Wunder großes Glück." With a team of more than 45 production professionals, Filmwerk has gained a reputation as one of Germany's leading media production specialists.

Integral to that has been the company's technical collaboration with systems integration partner, Systempiloten. Director, Thorsten Feldmann, undertakes an ongoing process of research and testing of the latest in video production workflows. "I refer to our work for Filmwerk as innovation scouting," he reveals. "It's our job to ensure that Filmwerk remains at the forefront of technical innovation in order for its production teams to have access to the very best creative workflows."

With growing demand for multi-cam productions from its clients, the next step was for Filmwerk to develop a mobile offering. "Putting Filmwerk's production capabilities on wheels was a logical development in expanding the production company's services," explains Thorsten. "So much of this work is location based, where space is quite often tight, so the practicality of being able to drive up to a set with a ready to production gallery was appealing."

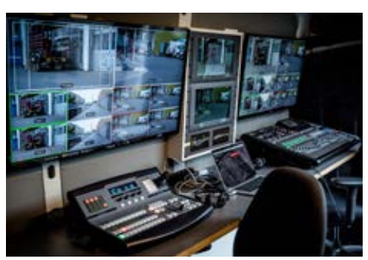
Flexibility was a key requirement for the outside broadcast (OB) SNG, as Filmwerk produces such a wide range of content; from commercials to live streaming to recording for episodic television series. Taking that into consideration, Thorsten was tasked with developing a multi purpose vehicle that could be adapted to manage both live-to-tape and live stream OB workflows.

"Our goal was to deliver a solid, yet adaptable vehicle that would not only surpass the demands of Filmwerk's current projects, but would also be a future proofed platform to assist the team in years to come. The majority of Filmwerk's current projects are produced in HD, but of course, Ultra HD is already here, so it made sense to ensure the vehicle had this capability." Nothing in the market existed with Filmwerk's desired file based workflow, and so they opted to build their own solution.

Systempiloten had just three weeks to plan, specify and build the OB SNG van following the client's brief. An IVECO Daily 35 was chosen as the housing vehicle. "It is large enough to accommodate a five strong production team, but it is still small enough that it can be driven into almost any location," explains Thorsten. "We took a modular approach to the design, creating dedicated workspaces for the technical director, ingest operators and audio technicians."

Having had a huge amount of previous success with Blackmagic Design, Thorsten was confident in basing the OB workflow on the same proven technologies. "Blackmagic hardware has formed the backbone on many client projects, and it has always proven itself to be highly reliable, and robust, even in the most demanding of circumstances."

Designed based on a file based workflow, the goal was to allow Filmwerk's production team to produce content with a live on tape workflow, where each ISO camera feed and program signal is recorded onto either one or multiple ingest servers, or a live production set up, where the program mix can be streamed directly from the van.



Currently the van is equipped with six Sony XDCAMs, however the solution is scalable and can handle up to a maximum of twelve when working on larger scale productions. Each camera is equipped with an ATEM Camera Converter, providing talkback and tally, and allowing Filmwerk to use optical fiber to send camera signals back to the OB, giving production teams the ability to set up over greater distances, without compromising on signal quality. A series of ATEM Studio Converters receive the optical fiber and convert back to SDI.

The ISO camera feeds, together with pre-recorded VTs, graphics and additional media are taken into an ATEM 2 M/E Production Studio 4K switcher, where the vision mixer produces the program mix using Blackmagic's ATEM 1 M/E Broadcast Panel.

Thorsten explains that the van has been equipped with extensive preview monitoring to ensure that production values remain high at every stage of the workflow. "It's not uncommon that we'll move between locations on a job and so it's important that we can get set up quickly and ensure that everything is consistent. So not only does the OB feature Blackmagic's UltraScope's on board, but also two large screens displaying a multiview output, providing the whole team an immediate view of everything that is happening."

All of the video and audio signal distribution onboard is handled by a Smart Videohub 20x20 from Blackmagic Design, and distributed using the Videohub's software control. The OB SNG handles both file based audio, as well as embedded audio in the SDI.

File based audio is mixed using the Behringer Midas X32 and recorded via IP to a 64-track Dante equipped multi-track audio recorder. The 8 channels of digital audio embedded in the SDI video signals are de-embed using a Mini Converter SDI to Audio 4K, mixed and routed over the Smart Videohub 20x20 matrix to the desired ingest channels.

"In terms of broadcast, it depends on the client's requirements, but the OB SNG has six HyperDeck Studio Pro SSD broadcast decks on board, which act as back up recorders, and sit alongside the ingest server, while also offering the ability to encode and stream onboard. So it really can be configured to fit any production requirements," explains Thorsten. "Filmwerk is also able to deliver in a number of industry standard codecs and formats, again, making certain the unit is flexible enough to adapt, regardless of the end-client or their needs."

In order to offer that level of flexibility, the OB van has been equipped with a KA-Band satellite and with encoder. Not only does this offer an upload bandwidth of up to 10 m/bits, and the same again down-stream, but it can also be used as a WLAN hotspot when on location. The OB SNG also features TVU's wireless LTE uplink solution, housed in a backpack, providing dual transmission encoding whilst roaming on location.

Filmwerk will look to develop its Ultra HD productions in the short term future, and as all of the Blackmagic infrastructure on board is able to handle formats up to Ultra HD 4K, Thorsten is confident the van will not only be a central element of Filmwerk's production workload, but will also form a blueprint for other production companies across Europe to follow.

"The majority of European production houses are having to balance ever tightening budgets with extremely high production values and need for flexible, cutting edge workflows. With the advent of simpler, file based workflows, we've been able to implement best practice from live OB and combine this with broadcast quality video workflows, to deliver a highly effective and multipurpose SNG solution that can be adapted in minutes," he concludes. "Flexibility will continue to be a decisive factor in production, and those companies who take stock now to ensure they are fast enough to adapt will be the ones reaping success in years to come."

Video

- ATEM 2 M/E Production Studio 4K
- ATEM 1 M/E Broadcast Panel
- ATEM Camera Converter
- ATEM Studio Converter
- AVID DN x I/O (AVID MediaComposer)
- Ingest Server, 6-channel HD-SDI
- Blackmagic Design HyperDeck Studio Pro
- 39" Screens for Multiview
- Blackmagic Design UltraScope
- Riedel Intercom

Acquisition

- Sony PDW-700 XDCam
- Canon HJ14ex4.3
- Canon HJ22ex7.6

Audio

- Midas X32 Dante Mixer
- SoundDivice 970 Multitrack SSD Recorder
- Genelec 8030 Monitor
- Mini Converter Audio to SDI

RTL2's Kleines Wunder großes Glück

A groundbreaking look at the drama and emotion of a German maternity unit, from the perspective of the parents-to-be and maternity ward staff, Filmwerk has been involved in the production of this observational documentary series for the last three years.

Filming of the series, which is produced by Saga Media, a Cologne based production company, takes place at the Südstadt Rostock University teaching hospital. Unable to rig up a temporary studio space inside the hospital, Saga Media brought in Filmwerk to supply a OB SNG solution in order to provide all of the studio facilities necessary to deliver the the four month long production.

The ability to provide a fully equipped television studio on location was an essential component in successfully producing the series, particularly with production crews requiring an unobtrusive, round the clock presence on site in order to capture the story of each birth as it unfolds. "With our OB SNG solution, we were able to offer the customer a state of the art, studio based workflow, on site at the hospital. This meant that multitrack sound and camera rushes could all be acquired and cut on location, quickly and efficiently," explains Dirk Wojcik Geschäftsführer, CEO of Filmwerk.

FILMWERK PRODUKTION

http://filmwerk.com/home/

Blackmagicdesign

systempiloten

SOCAL RENTALS DRIVES LIVE EVENT PROAV, BROADCAST AND REALITY TV PRODUCTION WITH AJA KI PRO ULTRAS AND MORE

SoCal Rentals was founded in 2008 to provide clients in broadcast, reality TV, live event production and AV/staging with full service audio, video and LED solutions offering production-specific engineering design, equipment rentals, expert technical management, project consulting and crews.

The company recently added 12 AJA Ki Pro Ultras into their rental pool, which already includes massive quantities of AJA gear including hundreds of FiDO fiber and Hi5 SDI to HDMI Mini-Converters, 30 Ki Pros, 20 Ki Pro Racks, multiple FS1 and FS2 frame synchronizers, KUMO routers and more.

"We've always preferred AJA products for their performance. In the rental business, gear is truly put to the test and is constantly in rotation—our AJA gear has proven to be more durable and reliable, and their support is outstanding," said Eric Broderson, Founder, SoCal Rentals.

The company's recent purchase of 12 Ki Pro Ultras will service broadcast clients working in 4K and UltraHD, "We're building a 4K flypack and are using Ki Pro Ultras as our record source. Ki Pro Ultra provides a really inexpensive solution for 4K workflows and the way that two of them fit perfectly side-by-side into a rack is super convenient. The built-in LCD screen is a huge benefit and the upcoming Pak-Adapt-eSATA option and Avid DNxHD and DNxHR support are features we're really excited about too," Broderson continued.

Despite an increasing demand for 4K solutions, productions don't always have the budgets to accommodate more expensive hardware requirements. Explains Broderson, "We see clients who want 4K but are still operating on an HD budget—and they want to avoid the typical large rastersize cost overhead. Many of them will accept Apple ProRes files as their final deliverable, and with Ki Pro Ultra we can accommodate their needs while offering a significant cost savings and still delivering top quality 1080 HD or 4K files."

In addition to providing rental packages to reality shows that include "Teen Mom," "Celebrity Rehab" and "Family Therapy," much of SoCal Rentals' business comes from live event ProAV setups for the MTV Movie Awards, the VMAs, the Grammys, the Kids Choice Awards and more.

For live awards shows, SoCal Rentals has built and designed custom press bridges for signal distribution from the red carpet, press room, performance stages and more. These events often utilize hundreds of AJA FIDO fiber converters to transmit signals reliably.

"We've been providing press bridges for The Grammys, and last year designed about 20 of them, all using AJA re-clocking DAs, AJA's openGear frames and HD10AMAs to do audio embedding and de-embedding. Most recording, broadcasting backup feeds and press tent activities were recorded to Ki Pros. We used FS1 to sync video, keep it referenced and downconvert from HD to analog. AJA's FS products are great for unpredictable client deliverables—in this case it was HD-SDI with embedded audio, SD-SDI with embedded audio and composite video with 32 channels of analog mono audio!

Live event production can be incredibly stressful but between our Ki Pro, FS and vast collection of AJA Mini-Converters we're always able to find that "OBTW," or as we call it, the "Oh by the way" product that delivers a quick fix when the deadline-driven world of live production presents us with a seemingly unsolvable workflow challenge," concluded Broderson.

SoCal Rentals will continue to expand their inventory of AJA kit as they plan to grow with a new location opening next month in Atlanta, and more soon to follow in San Francisco and Las Vegas. For more information visit www.socalps.com.

About AJA Video Systems, Inc.

Since 1993, AJA Video has been a leading manufacturer of video interface technologies, converters, digital video recording solutions and professional cameras, bringing high-quality, cost-effective products to the professional, broadcast and post-production markets. AJA products are designed and manufactured at our facilities in Grass Valley, California, and sold through an extensive sales channel of resellers and systems integrators around the world.

AJA® VIDEO SYSTEMS

For further information, please see our website at ***www.aja.com.***

GLOBAL BROADCAST SOLUTIONS

Bexel expertly delivers unparalleled production services and bespoke solutions for the live broadcast market, with expertise in hire equipment, systems integration, fibre solutions, managed services and product sales.

BEXEL

With a global footprint that has recently expanded beyond North America to include Europe and Latin America, Bexel is equipped to deliver the most important sporting and entertainment events to a worldwide audience.
The company has earned the reputation of an innovative broadcast services provider with international aptitude, where dependability and expertise come standard. Whether local, or on location, Bexel's operational excellence is evident by the company's ability to adapt in technically challenging and high profile environments.
Bexel has mastered the art of service, with a distinctive approach that demonstrates that no two projects are the same. On any large-scale project, Bexel evaluates the site parameters, technical environment and production expectations to ensure a unique solution scaled to the client's needs, creating a true partnership. The company has a keen ability to anticipate risks for technical failure due to environmental conditions, shipping logistics and tight deadlines. The combined experience, knowledge and technical expertise of Bexel's team make up the company's competitive edge.
As a Vitec Group brand, clients benefit from access to a remarkable range of Videocom equipment with presence in North America, Europe and Asia, bringing complete engineered solutions for around the camera, in the studio and outside broadcast. Most notably, Bexel's portfolio of top tier production services companies is comprised of Autocue Hire/QTV Teleprompters, Autoscript Hire, Bexel ESS, Bexel TSS, Camera Corps and The Camera Store. Operating globally, Bexel's expansive footprint is positioned to provide technical support 24 hours a day, seven days a week.

Equipment Hire and Production Services

Bexel continually invests in leading broadcast equipment and technologies to meet the needs of the market. From the latest 4K and HD broadcast camera systems, to robotic, super slo-mo, and specialty cameras, Bexel has a host of equipment to complement any production, including lenses, recorders, server solutions, LED lighting, fibre optic solutions, graphics and virtual production, custom flyaway systems, RF audio and intercom, 4K monitors, and terminal gear. All equipment is maintained to the highest standards by a rigorous QC process conducted by in-house certified engineers for inbound and outbound equipment.
Bexel is able to fulfill the needs of some of the most high profile networks and broadcasters, do in part to the company's continual expansion and investments in key trends. Bexel's 4K assets have extended to include Sony HDC-4300 camera systems, Fujinon UA80x9BESM 4K telephoto lenses, and the Sony BVM-X300 4K OLED critical monitor. Unique terminal investments include the Leader LV5490 4K waveform monitors, For-A ESG-4000 4K test signal generator, and For-A SCV-8000 bi-directional 8K and 4K signal processors.

The company's talented engineering team has an ongoing commitment to enhance and evolve the media production experience. Through comprehensive site surveys, transparency in logistics and project planning, and their ability to anticipate on-site challenges, Bexel has a proven track record for meeting the requirements of mission-critical projects.
Bexel provides bespoke production systems and uncompromised engineered solutions to help capture the essence of live event production. The company has a rich history in supporting many of the industry's largest and most respected broadcasters, and have since developed long-term relationships with:

ESPN (USA)	*NFL (USA)*	*Turner Broadcasting (USA)*
NBC (USA)	*CBS(USA)*	*Boomdog (Mexico)*
BBC (UK)	*Netflix (USA)*	*Telemundo (Mexico)*

Bexel's ability to design, build and support technically advanced, scalable production environments with an exceptional engineering team has been their recipe for broadcast excellence.
Bexel's mastery in fully managed production services support large-scale, technically advanced projects involving fibre optic solutions, RF intercom and audio, graphics production, specialty cameras, workflow solutions, flyaway systems and mobile facilities. The company's operational excellence has played an integral role in the broadcast success of some of the world's most recognized events.

Project: Pope Francis' Apostolic Visit to Ecuador

Bexel was contracted by Secretaría Nacional de Comunicación (SECOM) to support the broadcast of Pope Francis' apostolic visit to Ecuador by providing the host feed infrastructure.
To capture Pope Francis' welcome ceremonies and mass in both Quito and Guayaquil, Bexel built two International Broadcast Centers (IBC's) across both cities. To ensure the most complete coverage possible while the Pope traversed public routes, Bexel installed wireless camera systems in a lead vehicle and a chase vehicle around the popemobile, along with two stabilized camera systems mounted on two police helicopters for city-wide coverage. This maximized flexibility in securing coverage between locations in both cities.
The company received, managed, and reviewed all program signals from the eight Outside Broadcast (OB) mobile units stationed along the Pope's travel routes, and distributed the feeds from their IBC to broadcast to a worldwide audience. In addition, the company provided the press distribution in both cities. Bexel's international aptitude was key to delivering the best-in-class production services that offered viewers a unique experience of the historic event.

Project: Super Bowl 50 heads to California

Bexel supported CBS Sports in building a large post-production and graphics facility for the broadcast of Super Bowl 50 from Levi's Stadium in Santa Clara, California. The facility included fully outfitted Avid editing suites sharing 64 terabytes of ISIS storage; Adobe Premier editing systems; Adobe After Effects, Red Bee, and Vizrt graphics systems for a CBS production team that numbered approximately 80 people.
The company also had 14 technicians onsite to provide support for a host of broadcast equipment: seven Sony HDC-4300 super-slo-mo camera systems (including two 4K systems), five Fujinon lenses, 11 EVS XT3 12-channel systems, 40 EVS IPDirectors, seven EVS XT Access systems, 20 Autoscript teleprompters, more than 100 Litepanels lighting systems, and 15 miles of fibre-infrastructure within the TV compound and around the stadium to connect three CBS Sports sets.

Project: An eventful summer in Rio de Janeiro

At this year's summer events in Rio de Janeiro, Brazil, Bexel once again proved it's unparalleled ability to support the broadcast of large-scale, multi-venue events in the most efficient way. Among a number of unique location and logistical challenges, the Bexel team was tasked with supplying more than 61,000 kilograms (or 135,000 pounds) of production equipment ranging from flypacks, cameras, fibre, audio processing and monitoring, video conversion, video monitors, recorders and terminal to help a large number of international broadcasters cover the multitude of sporting events.
Bexel had 25 skilled engineers and project managers on the ground to support nine fully equipped multi-camera flyaway systems, consisting of Sony and Grass Valley camera systems, Evertz routing, and Sony and Grass Valley switchers. The company supplied over 50 Sony and Grass Valley camera systems (including 4K and slo-mo), 30 Panasonic P2 ENG camera packages, over 50 Canon and Fujinon HD lenses, complementary camera supports, RF intercom, and terminal accessories, in addition to over 5 miles of fibre to cover a variety of sporting venues, including beach volleyball, diving, cycling, golf, gymnastics, rowing and rugby.
The summer games in Rio de Janeiro spotlighted the breadth and expertise of Bexel's broadcast capabilities, ensuring the success of a high profile, multi-venue event for a worldwide telecast.

Systems Integration and Managed Services

For decades, Bexel has designed robust systems to meet the demanding requirements of broadcasters across the globe. The creation of the company's specialized business segment, ***Bexel ESS***, offers that same level of experience and engineering expertise, focusing on the vital part technology plays in media and broadcast production. The ESS team offers clients a unique view on the selection, implementation and integration of broadcast and media technology. Since it's introduction in 2012, Bexel ESS has been the choice vendor for custom systems integration, managed services and fibre optic solutions for high-profile broadcasters and networks. Bexel ESS designs and installs complete turnkey solutions for permanent facilities, major events and live game production. Their custom solutions are fine tuned to deliver outstanding product performance and broadcast workflow. From small multi-camera systems and flyways, to completely integrated control rooms and studios, Bexel ESS is a long-term partner in engineered broadcast systems.

Whether it is a stadium, arena, entertainment venue, campus or a remote environment, Bexel ESS has the experience, equipment and renowned technical expertise to deploy complex broadcast solutions. Bexel ESS provides a full complement of services, expert optical equipment installation, and infrastructure solutions for live event production, partnering with some of the most notable stadiums and arenas:

AT&T Arena	***University of Notre Dame***	***LA Coliseum***
US Bank Stadium	***University of Arkansas***	***Texas Rangers Ballpark***

Bexel ESS has a unique industry perspective and understands the future of broadcast-specific technology and its impact on the market. As a result, the ESS team can advise its clients about future technology applications and how to properly plan for them while designing a facility or preparing for an event, maximizing their client's investment.

Case Study – Crewless Studio

With thousands of hours of live event, news and originally programming annually, Fox Sports 1 and the Big Ten Network needed a flexible way to easily contribute remote interviews into their broadcasts. Traditional methods, like satellite links, take too long to commission and are costly. Bexel ESS designed and built a cost effective and efficient solution, helping broadcasters gather interview content quickly, and with more flexibility. The Crewless Studio is an innovative system that enables the analysts to go on-air immediately. The Crewless Studio's Haivision HD encoders stream bi-directional, low latency video over a private or public network, encoding up to 1080p video for interactive communications between the remote commentator to the studio during a live broadcast. The units also include an AW-HE60SN Panasonic camera and Litepanels 1x1 Bi-color panels, both of which can be controlled remotely, allowing the client to pan, tilt, zoom the image or adjust the light intensity. The custom case includes a UPS to control power, an IP power switch, a network switch that keeps the circuit open, and audio/video support that provides the IFB and camera feeds. Doug Levy, VP, post production for Fox Networks Engineering and Operations commented, "Speed to market is crucial in the world of sports news, and these in-home studios have been very effective for us in delivering breaking news. Bexel ESS was the most appropriate choice for this project. They have a long and extremely good track record as both a rental house and an integration company, and we knew their team could get the job done."

Product Sales

Bexel's specialized business segment, Bexel TSS offers competitive pricing on new and used broadcast video and professional audio equipment. From complete camera chains to lighting systems, audio mixers and converters, Bexel TSS provides customers with comprehensive solutions to support a variety of production needs and budgets. Backed by Bexel's world-class engineering and a proven track record for reliability, Bexel TSS ensures the best in audio and video technologies.

Project – CCI Communications

When CCI Communications upgraded their Gerling production truck to high definition, Bexel TSS helped meet their goals on time and on budget, with added capability and flexibility for future projects. CCI's Vice President of Operations, Steve Selinger, commented, "Working through Bexel TSS, we were able to secure equipment from top-of-the-line manufacturers, and remain within the confines of our budget. What separates Bexel from other equipment providers is the high level of product they carry, both in their rental and sales departments. The company provides quality equipment that is reliable, and their customer service personnel are dependable. I was confident that all purchases would be in good condition, and if an issue arose, I was just as confident that Bexel would stand by their products and work to reach a resolution."

Bexel Liquidation Services

The company has recently introduced an additional service to their offerings, assisting companies with asset removal and auction coordination. Clients are able to maximize return on marketable equipment, and properly dispose of equipment in compliance with environmental regulations. Bexel Liquidation Services offers routine auctions throughout the year to assist in a variety of equipment sell-off needs.

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General Contacts

BEXEL

Bexel United Kingdom Camera Corps
111 Chertsey Road
GB-KT14 7AX
Byfleet, Surrey
services@bexel.com
Tel +44 (0)208 618 0236

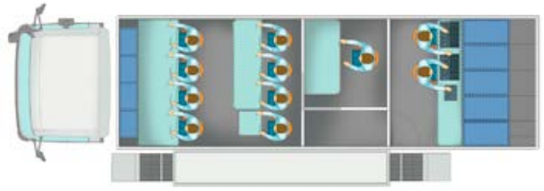
Bexel United Kingdom Autocue/Autoscript/ The Camera Store
Unit 2 Heathlands Close
Twickenham
Middlesex TW14BP
services@bexel.com
Tel +44 (0)208 618 0236

Bexel North America
2701 North Ontario Street
Burbank, CA 91504
Tel +1 800 225 6185
services@bexel.com
www.bexel.com

Bexel ESS – Systems Integration
1000 Nolen Drive, Suite 100
Grapevine, TX 76051
+1 972 870 2318
ESS@bexel.com

Bexel TSS – Product Sales
2701 North Ontario Street
Burbank, CA 91504
Tel +1 818 565 4339
sales@bexelTSS.com
www.bexelTSS.com

GEARHOUSE BROADCAST SELECTS HITACHI TO PROVIDE NEW MIDDLE EASTERN AND SOUTH AFRICAN OB VEHICLES



In the international Outside Broadcast (OB) market big is not always most beautiful. From its state of the art design and manufacturing centre in Istanbul, Hitachi Kokusai Turkey (HKT) has developed a range of compact and versatile OB vehicles that provide a range of highly cost-effective production solutions.

First established in 2013, HKT works with a number of international broadcast clients. Its advanced design, engineering and coach-building capabilities are such that HKT can take a standard vehicle and adapt it to the exact needs of a broadcaster or service provide in any market, operating in any climatic conditions. One company that Hitachi works closely with is international broadcast solution provider, Gearhouse Broadcast. Recently, the company has invested in two new OB vehicles – one each to support client business operations in South Africa and Qatar.

Vision View Productions

Working together, Hitachi Kokusai Turkey and Gearhouse Broadcast have delivered a ten camera full HD outside broadcast truck to leading South African services company Vision View Productions. Following extensive systems design, integration and testing at Hitachi Kokusai Turkey's facilities, the vehicle has been commissioned in South Africa.

Using a locally sourced 26 tonne Mercedes-Benz Actros truck to meet South African fuel and emission regulations, Gearhouse Broadcast and Hitachi modelled the workflow as closely as possible to its OBLite trailer that Vision View purchased in 2014. The new vehicle is equipped with nine Hitachi HD-SK1200s and one Hitachi HD-SK1500 slow motion camera and Canon lenses as well as two Q-Ball point of view cameras.

Inside the spacious unit is a Ross Carbonite Black CB3X vision mixer, two EVS XT3 live production servers, a NewTek 3Play slow motion instant replay system and a 32 channel Studer Vista 1 audio console. It also offers discrete 5.1 surround sound audio through an extensive set of Sennheiser microphones including the Esfera SPM 8000 with SBP800, four MD 42s and six MKH 416s.

Mafadi Mpuru, managing director at Vision View said, "To put it simply, this new truck is beautiful. We're delighted with the build quality, how well it performs and how comfortable it is to work in. Its size gives us the ability to cover larger events, but still be flexible to take on a wide variety of jobs. The similarity in workflows and equipment with our Gearhouse OBLite trailer means we can switch crews between the two seamlessly."

Nigel Haniff, account manager at Gearhouse Broadcast added, "As Vision View has demonstrated with this investment, there's a growing demand from operators for mid-size and smaller OB vehicles that give them the flexibility to deliver productions of different sizes."

Gearhouse Broadcast Gulf

A second compact multi-functional outside broadcast production vehicle with sophisticated DSNG capabilities has been supplied by Hitachi Kokusai Turkey to Gearhouse Broadcast Gulf, based in Qatar. The Iveco 70C17 is fully 3G and HD compatible and is available to rent throughout the Middle East.

Ideal for use both as a small, flexible production vehicle and in the field newsgathering, Gearhouse's new van excels on productions where a larger OB truck would be impractical or cost prohibitive. The state of the art van comfortably seats a crew of seven and is available to rent across the region on a dry hire basis or complete with a crew of skilled and experienced operatives. The seven tonne Iveco truck is fitted with 62,000 BTU air conditioning – perfect for the Middle Eastern climate – and measures approximately 4m (h) x 8m (l) x 2.5m (w) with an expanded fully operational total width of 4.5m.

Flexible and featuring the latest technology from many leading industry vendors, the vehicle is well suited to provide facilities to local production teams or international crews shooting in the region. Its implemented workflow is suited to servicing a number of events including outside news broadcasts, political events, award ceremonies or sports.

Small footprint, powerful functionality

The brand new production truck with DSNG capabilities runs six main Hitachi SK-HD1300E cameras with two optional Vislink 1700 RF cameras, and a wide choice of lenses are also available. It's

fitted with a 36 input switcher with 2ME's, 48x48 video router and Imagine Communication's glue that includes frame sync, audio de-embedding and embedding facilities. A multiviewer and a Sony HDW-M2000P digital recorder and player are also installed in the vehicle and an EVS XT3 live production server can be added on request. The vehicle comes fitted with a Yamaha DM1000VCM 48 input 18 fader audio desk and a 32 port talkback system.

The vehicle's satellite is a fully motorised, redundant 400w DSNG 1.5m 1+1 Ku band 2 port system. It features an encoder/modulator to support SD and HD MPEG-2, MPEG-4 and AVC codecs in 4:2:0 or 4:2:2 8 or 10bit sampling rates. To support the truck's facilities an on-board 15KVA generator has been fitted.

"With the introduction of this new production vehicle and its DSNG capabilities, Gearhouse Broadcast Gulf has addressed the growing demand for access to a privately owned state of the art portable OB solution throughout the Middle East," said Eamonn Dowdall, managing director of Gearhouse Broadcast Gulf. "The region has become a major media hub and is now a booming market so we're delighted to be able to offer it access to the latest in production solutions."

Hitachi Kokusai Turkey

Hitachi Kokusai Electric Turkey (HKT) is headquartered in Istanbul, Turkey and also has a manufacturing facility in the Tuzla free trade zone near Istanbul. From its 8.000 square metre production facility, HKT designs and manufactures some of the broadcast market's most cost-effective high-end products, systems and solutions, serving customers in the international broadcast industry and government institutions. In the past three years the facility has grown strongly to become one of the largest OB vehicle design and manufacturing facilities in the region. HKT customer list extends far beyond the Middle East region: the company serves customers in Europe, MEA and Asia

Hitachi's strategy has been to create a centre of excellence in OB facility creation and broadcast systems integration all under one roof within the Tuzla free trade zone. The company has brought together many of the broadcast industry's most creative minds: their skills stretch from strategic conceptualization and systems integration, through to specialist coach building capabilities.
HKT utilize a blend of their own broadcast system components and also equipment from many of the world's leading technology vendors. The objective is always to blend the perfect combination of production tools to meet the specific requirements of each customer.

HKT design, develop and manufacture mobile antenna systems, controllers and SATCOM components, which are integrated into customized DSNG (Digital satellite news gathering) vehicles, special purpose vehicles or Outside Broadcasting trucks that the company designs and manufactures within its facilities.

HKT's DSNG systems are based on the Mercedes Vito, Sprinter and Iveco vehicle models, weighing up to 7 tons. Vehicles from other leading car makers can be converted as well. For system integration purposes, the company uses its range of antenna systems, Satcom equipment and components, making turnkey solutions economically efficient.
HKT's broad base of experience in the design and systems integration of high-end video production studios is used to convert large vehicles into mobile digital studios (OB vans), giving broadcasters all the mobile production and broadcasting capabilities they need. HKT compact OB Vans can support up to 16 HD cameras. The company specializes in developing smaller, more versatile and cost effective OB solutions.
OB-BOX is a fully featured modular OB facility, which is delivered to the customer and then mounted onto a vehicle's chassis using a proprietary fixing kit.

OB-BOX comes in three different configurations which support four, eight and 12 production cameras. The option of a booth side extension adds further flexibility to unit sizing. In addition, an ability to connect two OB-BOX units in a cascade configuration adds more versatility and facilitates many different sizes of OB unit up to 20 camera mobile facilities. Each OB-BOX is specified, designed and manufactured at Hitachi's Istanbul-based facility to meet the customer's OB needs. The unit provides all of the video, audio, transmission and infrastructure capabilities needed to create a stand-alone outside broadcast facility. The technical specification of the unit is such that it will support any broadcast signal from serial digital to HD and 4K production. Alongside satellite and fiber connectivity, the units integrate powerful Ethernet connectivity, which provides the production team with internet facilities on site. At the same time, OB-BOX features sophisticated Cloud capabilities, which enable the users to send 4K content back to the broadcaster's production centre quickly and easily.

Broadcast system cameras

Alongside its OB facilities, Hitachi Kokusai supports one of the broadcast market's largest ranges of system cameras. These include the SK-UHD4000 4K Ultra-HDTV broadcast camera system. And the newly developed SK-HD1300 Series which are fitted with 3G 2/3 inch 1080p native 3MOS sensors. Also available is Hitachi's Z-HD6000 1.5 G 1080i portable dockable HDTV studio and EFP cameras providing 1100TV resolution. All these cameras feature High Dynamic Range (HDR) and real-time lens aberration correction (RLAC) functionality. Further versatility is offered by Hitachi's new DK-H200 3G 1080p Box Type POV camera, which is well suited to multi camera broadcast applications.All Hitachi cameras feature the company's enhanced triax and fiber transmission technology, which significantly extends cable length possible between camera head and control unit, by around 4000m with hybrid fiber and 1800m with triax cable.

Company details:

HITACHI
Inspire the Next

Hitachi Kokusai Electric Turkey
Palladium Ofice, Halk Caddesi No:8/A
Atasehir 34746 Istanbul-Turkey

Branch office & Factory:
Hitachi Kokusai Electric Turkey
Istanbul Endüstri ve Ticaret Serbest Bölgesi
Akif Kopuz Cd. No:3
Aydınlı-Orhanlı Tuzla 34957/ Istanbul

Tel: +90 216 394 29 08
Fax:+90 216 394 29 09
E-mail:cemal.yilmaz@tr.hitachi-kokusai.com
www.hitachi-kokusai.com
www.hitachi-kokusai.co.jp/global

ENHANCING SOUND STUDIO FLEXIBILITY AND PRODUCER EFFICIENCY

COMBINATION OF AVID S6 WITH IHSE DRACO TERA KVM SWITCH

The revolutionary Pro Tools | S6 control surface is the ultimate tool for audio professionals. Its modular and flexible architecture allows operators to design the perfect mixing surface for individual workflows. For even greater functionality and convenience, the Draco tera KVM switch has been integrated into the Pro Tools | S6 system. With this combined solution any Pro Tools workstation can be placed on any screen and instantly accessed by a simple button press.

The ability to construct sound studios with all equipment in a centralised location is a highly attractive proposition; offering the possibility of accessing and sharing editing tools between separate studios. With a central KVM switch connected to banks of editing workstations, content storage devices and audio tools individual studios can be assigned to projects rather than dedicated roles. Equipment can be nurtured and maintained more effectively and expensive software licences assigned as needed, rather than for each individual studio.

Editors and sound mixers can use the most suitable room, which greatly enhances the deployment of valuable resources and makes studios re-assignable: a boon to facilities that operate on an hourly-fee basis. In today's multi-national production industry, this solution allows multi-national post-production organisations that operate on a global basis to construct all facilities to the same standard. It means instant familiarity to producers who can cross the globe, knowing that they will meet the same set-up and system configuration everywhere and immediately resume work on individual projects in any editing suite, in any country.

The absence of local computer hardware with accessible input and output ports enhances security: rogue software cannot be loaded or valuable content copied and removed. The content itself can be more rigorously controlled and backed-up and editors can be sure they are accessing the latest and correct versions.

Like the S6 itself, the Draco tera compact switch acts and feels like an extension of the Avid editing software. Delivering instant response and complete flexibility, the Draco tera switch is an essential element of every professional audio mixing installation. It allows operators to focus on the job in hand, rather than become distracted by the equipment. Studios can be built to operate with utmost flexibility and efficiency.

Deluxe Entertainment Services Group

Deluxe currently operates studios in 25 regions throughout the world, employing over 7,000 of the most respected artists and technologists in the industry. Beginning as a film lab in 1915, Deluxe has established a legacy as a trusted partner for top content owners, creators and brands. Its comprehensive suite of global digital delivery solutions enable clients to move, manage and monetize content, and it offers world-class creative services that underpin some of the most ground-breaking and meaningful projects in entertainment and advertising.

The Deluxe facility on Seward Street in Hollywood was designed around Avid | S6 Consoles and Pro Tools | HDX, which, as Doug Higgins, Deluxe director of audio services explains, delivers significant advantages: "At the core of our operation is the ability to be dynamic and flexible, seamlessly moving Pro Tools sessions between mix stages with minimal setup and turnover times. Keeping all of our work and automation recallable across any of our mix stages from the temp mix to the final print master is invaluable. We have to be able to move quickly and an Avid infrastructure efficiently facilitates most workflows. The learning curve on a S6 mixing surface is generally faster and easier because our teams and clients know Pro Tools. From an internal facility maintenance and support standpoint, having a modular mix console throughout our infrastructure eliminates nearly any stage down time.

Deluxe global approach

Adding a KVM matrix switch to the infrastructure delivers additional flexibility of equipment and studios: "Having a central machine room and controlling systems from anywhere in the facility gives great flexibility. All systems are on an IHSE Draco tera KVM switch, through which we can completely dynamically allocate any system to any room rather than the older model of 'being directly connected'. It also means that we can quickly reallocate systems without any downtime should a failure occur."

The approach adopted by Deluxe globally is to standardise all studios on a common format. Higgins says, "We knew that customers needed to be able to come in and out of Deluxe with their audio content and not have any lost time in lengthy recalls or setups.

Draco tera compact KVM switch

With the shrinking budgets and timeline compression, efficiency is more critical than ever. We need to quickly move projects and mixes around the world on a uniform platform, not just from our own facility, but Deluxe and our partners worldwide.

Recent installation

The recent upgrade at the Deluxe audio facility in north-west London reflects this approach with equipment supplied and integrated by Scrub, a division of HHB Communications. In an intensive 10-week integration period, Scrub, the UK's leading Avid Pro Tools | S6 solutions partner, installed and commissioned a 10ft-wide dual operator Avid Pro Tools | S6 M40, one of the largest S6 control surfaces in the UK, at the heart of the site's flagship room: Theatre 1.

Combining two M40, 24-fader configurations controlling multiple Pro Tools | HDX systems, the S6 also benefits from the addition of two Pro Tools | S6 Joystick Modules. Scrub supplied an IHSE Draco tera | S6 KVM switch at Deluxe's request. Devin Workman, of Scrub was impressed by the solution: "Draco extender products provide the highest quality DVI video transmission. For enhanced flexibility, Deluxe chose to add the Draco tera | S6 switch, enabling any Pro Tools system to be placed on any screen. The Draco switch integrates directly with the S6, making it possible for the console-mounted DVI screens and USB devices to follow whichever Pro Tools workstation is selected from the console."

Separate quotes:

"Everything has to be very dynamic to move quickly and an Avid infrastructure is key to what we're seeing now and where we think workflows are going."

Doug Higgins, Deluxe.

"IHSE Draco tera | S6 provides the highest quality DVI video transmission and integrates directly with the S6, making it possible for the console-mounted DVI screens and USB devices to follow whichever Pro Tools workstation is selected from the console."

Devin Workman, Scrub.

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ES BROADCAST: A YEAR OF GROWTH

2016 has without a doubt been a year of significant growth for ES Broadcast, not only for the sales division, but in all areas of the business. There have been a number of additions to the team over the last 12 months, across all departments, securing the company's ability to expand into new aspects of the broadcast market, maximising the services we are able to offer to our growing list of valued customers.

More Partner Manufacturers, More Staff, More Support

At the beginning of the year we proudly announced that we had become a fully authorised Sony Professional Solutions Specialist (SPSS) for broadcast and professional products.

This was a great leap forward for the business as it added to an already impressive list of manufacturers that we support and represent. Amongst the 50+ brands ES sell are the likes of Canon, ARRI, Fujinon and Vitec and the addition of Sony means that we now offer a vast array of products to the market with more competitive pricing than ever before.

Along with forging new manufacturer relationships, we have also recruited additional experienced staff members to the team including further sales, engineering and customer service personal to provide our clients with the best possible service.

At the beginning of summer we appointed Ben Murphy as Commercial Director. Ben has nearly 15 years of experience in the broadcast industry, having previously held management and directorship appointments at broadcast equipment supply and integration companies. His in-depth understanding of the market and technology will ensure ES Broadcast continues to forge ahead as a market leader.

Flexible Solutions – We Help You Get the Assets You Need Now

As a reseller of both new, used and ex-demonstration equipment, ES broadcast can offer flexible options across a wide variety of equipment from cameras, lenses and grip to routers, glue and servers. Whatever the requirement – whether it be the latest 4K technology, HD equipment or even old SD legacy items – the expert team as ES Broadcast are here to make it simple for clients. In house engineers fully test every piece of used equipment to ensure quality and reliability. Our team comprises of knowledgeable individuals with a combined experience of over one hundred years in the broadcast industry.

We also offer an array of finance options though a variety of funding partners in the UK, Europe and further afield. Hire purchase, operating leases, payment holidays and many other creative solutions can help your business manage cash outlay when you need to grow your equipment fleet, our team can guide you to find the best suited option for your business.

Our hire division goes from strength to strength

At the start of 2012, ES Broadcast launched ES Broadcast Hire as its own entity with a single focus: to service the Outside Broadcast market - providing companies worldwide with the very latest, high-end broadcast equipment for both short and long term hire.

At the helm of ES Broadcast Hire is Managing Director, Warren Taggart, who joined the team with a wealth of experience and knowledge around all aspects the OB market and the associated equipment.

As the first rental house in the UK to make a major investment in 4K outside broadcast equipment, ES Broadcast Hire now has a very substantial fleet of the cutting edge products. This includes Fujinon UA80x, UA14 and UA22 lenses, Canon UJ90x, CJ12 and CJ20s and a fleet of nearly 20 channels of Sony HDC-4300 4K cameras, with more to be added over the coming months.

ES Broadcast Hire has grown very rapidly and at the beginning of 2016 the operation was greatly expanded with the outright purchase of Gearbox Rental – now integrated and rebranded under ES banner. Along with adding a large volume of assets to our rental fleet, this acquisition also brought further expertise to the team with Stephen Ratcliff joining as Hire Director. Stephen brings with him two decades of industry experience meeting the needs of OB companies, broadcasters, studios and production companies all over the world.

In addition to our expanding base in Greater London, a new office in Manchester means ES Broadcast Hire is now able to offer equipment and support not only to hubs like Media City, but right across the north of the UK.

But the expansion in 2016 has not been limited to the UK: next to join the team was Charles Alexis based in Munich. A fluent multilingual speaker, Charles is ideally placed to service our growing European client base and understand their rental equipment needs.

Decommissioning

Another service offered under by ES Broadcast is decommissioning of pre-existing studio or broadcast facilities and have completed decommissioning projects for major broadcasters all over the world.

We bring a team of professionals to carefully propose, plan and then dismantle installed equipment within client's spaces handling all the logistics and safe disposal obligations. The most popular reason we find people have for making use of this service is that is takes away the headache of what to do with all of that obsolete or no longer adequately utilised equipment taking up valuable space, all the while adhering to all of the Health and Safety regulations governing the disposal of electrical equipment.

Should there be any value in the equipment that we remove, a part-exchange figure is offered against replacement equipment. This has proven to be an invaluable service to many of our customer who may not have realised they have the budget to invest in the items on their 'wish list' until they learn the value of the used equipment filling up their racks.

Projects

When gearing up for a major live broadcast event, one headache that must be solved by the rights holders is where to purchase the kits for each various aspect of the broadcast - For example the build-up, pre-recorded athlete/player profiling, after-event interviews and of course the live feed of the game.

ES Broadcast has recently been commissioned to manage a project which included crew, logistics and a large number of ENG kits including camera, lenses, lighting and audio for a major football event. This enabled the customer to keep their costs down while at the same time using brand new equipment, specifically tailored to their needs, that we then put up for sale post the event.

Throughout all of our projects we are fully involved from planning phase, testing, purchase, logistics and eventual return of equipment. We are now fully equipped to offer this solution to other organisations and will actively look to grow this area of the business.

Outside Broadcast Vehicle Sales

A very important part of our business, that has been thriving in recent years, is our outside broadcast vehicle sales division. We started focussing on this in 2011 and ES Broadcast has now successfully sold trucks all over the world in various different sizes, configurations and standards.

With the vehicle often being the single greatest capital purchase for and OB company, finding a way to reduce this cost is one way to significantly reduce cost base and give a company a competitive edge often allowing customers to invest more of their budget in other essential areas such as the latest cameras, EVS and lenses. Equally an under-utilised vehicle on the books can be a big problem and turning this into cash quickly is essential. BU (One of many HD outside broadcast vehicles currently available for sale with ES Broadcast). ES broadcast has a wealth of contacts globally in the OB market and excel at matching vehicle buyers to sellers and vice-versa. We can assist in valuations of trucks and then use our vast customer network - amassed over the last 8 years - to advertise these vehicles on behalf of our OB clients through various digital and printed media to ensure we are able to find a new home for their vehicles. As an equipment sales company, we are able to couple these vehicle sales expertise with close relationships with all of the major manufacturers of OB equipment unit to offer a "turn-key" solution for our customers - ensuring that their production vehicle fully equipped to begin serving productions as soon as it is delivered.

Case Study

At the start of 2014 we were contacted by one of our major European outside broadcast clients and tasked with the project of selling 12 SD outside broadcast vehicles in various sizes as they looked to build HD Vehicles.

On the face of it, this seemed like a giant task, however never one to shy away from a challenge we swiftly rolled up our sleeves and began the process we always follow when selling any used OB vehicle. As these were SD vehicles, we did of course have some slight reservations over the remaining need for SD vehicles in mainland Europe.

However, upon fully inspecting the vehicles we saw for ourselves how well they had been looked after during their working life and how many of them would present an easy opportunity to upgrade many of the chassis to HD. As we began to complete sales on many of the vehicles we were reminded how diverse the market within Europe actually is. Although much of the news which drives the industry tends to be about the latest and greatest technology, there was certainly still appetite in the market to continue to invest in good quality SD vehicles to add to fleets. Throughout this process we were also able to couple the vehicles with plenty of SD equipment be it cameras, lenses, EVS, vision mixers etc from our existing used kit stock and our client base who were looking to upgrade their SD assets to current technology. This also enabled our customers to clear much of the store rooms - equipment all OB companies undoubtedly have lurking in their facilities -and provide plenty of customers with complete systems ready to begin work.

Overall we were able to complete the project ahead of schedule - all 12 vehicles had been sold before the year was up. This is just one instance that shows how we as a business are able to diversify our model and adapt to our clients' changing needs and expectations - providing good quality equipment in both the new and used; SD, HD and 4K marketplaces.

ES BROADCAST HIRE

TVC DELIVERS TAILOR-MADE SOLUTIONS FOR THE BROADCAST INDUSTRY

For the past 20 years, TVC has been a system integrator, designing broadcast systems and tailor-made OB vans designed to provide better results for broadcasters on a world-wide basis.

The company's history started back in 1976, with the TV Broadcast institute in Šiauliai (Lithuania), where all the broadcast equipment for CIS countries and OB vans were manufactured for the Moscow Olympic games in the summer of 1980. In 1996, following the Soviet Union collapse, a team of engineers established TVC. Over the years, the company has constantly grown and now works on projects around the globe.
With its head office still located in Lithuania, and subsidiaries in Kazakhstan, Georgia, Belarus, Ukraine and a wide partner network within Africa and the Middle East, today TVC offers a wide range of systems integration and solutions. These include coachbuilding and broadcast systems, which are customized to each client's needs, and delivering turnkey projects in both the private and government sectors.
TVC is one of the fastest growing, independent systems integrators in Europe and has completed hundreds of projects over the years, often acting as the main contractor. As well as being an expert in outside broadcast and TV studio integration services and coach building, the company also provides mobile surveillance solutions and complete installations for digital cinema, sports and entertainment arenas.
Taking on challenges is TVC's passion. Being able to offer a turnkey service is something the company is proud and which they believe gives them a competitive edge when delivering product, in terms of quality, cost-efficiency and providing a future proof approach.

TVC's customers believe in their solutions and know that by choosing them, they are guaranteed a highly quality experience and a reliable partner that offers a flexible, tailor-made approach, using the solutions that best suit the needs of its clients. By integrating equipment from the world's leading broadcast equipment manufacturers, TVC ensures seamless operation of multiple systems. This gives the highest standards of service throughout the lifetime of any project; from the initial idea, through implementation, to maintenance of the system.

TVC

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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
Evelyn Ode
Tel +49 89 41 55 97 02
Mobile +49 173 73 09 545
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