

Ceremonies Communications

...delivering complexity, simply



The Inaugural European Games, Baku, 2015



The P.A. People deliver the world's largest, clearest and most innovative ceremonies communications system for the inaugural European Games in Baku, Azerbaijan.

The opening and closing ceremonies of international sporting events in the 21st century have become their own genre of epic theatre. Used by host nations to communicate their history, achievements, values and ideals, the ability to conceptualise, design and deliver these vast spectacles is the preserve of a handful of elite international creative and technical agencies. Sydney's The P.A. People is numbered among these specialists, with an impressive track record of delivering communications solutions to events such as the winter and summer Olympics, Asian Games and Commonwealth Games.

The latest major project successfully delivered by The P.A. People was providing communications, CCTV and technical services to the ceremonies of the inaugural European Games held in Baku, Azerbaijan, from 12 to 28 June. In the newly constructed Baku National Stadium, an audience of 70,000 watched 2,000 performers and 6,000 athletes representing 50 nations in 20 sports open the games with a combination of traditional music and poetry, gravity-defying aerial effects, multimedia, international superstars, and pyrotechnics.

Equipment List - key items

- 2 x Eclipse HX-Omega Fiber Linked Frames
– *Main System*
- 1 x Eclipse HX Median frame
– *Revolve system*
- 1 x Eclipse HX Median frame
– *Rehearsal system*
- 15 x HelixNet Master Station
- 150 x HelixNet Beltpacks
- 80 x FreeSpeak II Beltpacks
- 200+ x V-Station IP-enabled Intercom Panels
- 1250 x Motorola hand held two way radios
- 1400 x ClearCom & Beyer headsets
- 48 x RFT Duplex repeater channels
- 64 x Motorola Simplex repeater channels
- 46 x Sony IP CCTV cameras
- 50 x CCTV viewers
- 4 x CCTV video servers
- 12 x FM transmitters
- 12 x FM signal processors
- 6,000 x mass cast FM receivers
- 46 x Plura Timecode displays
- 125 x Custom rack mount desk lights
- 100 x GDS IP enabled cue lights
- 22 x HP Procurve network switches 2620, 2920, 5406
- 18 x Socomec UPS, 2kVa & 7kVa



Poetry in Motion

Central to the opening ceremony was the giant revolving stage set in the centre of the ground. At different times, it was called on to hold hundreds of performers, rotate to display complicated scenery, emulate the birth of a mountain range with hydraulics, and have both water and fire emerge from it. Its first big moment in the ceremony was a section called 'Miniatures', in which 300 performers and 200 trap doors were utilised to create a revolving panorama of recreated illustrations from the works of Azerbaijani national poet Nizami Ganjavi, a 12th century writer and philosopher famous for works such as 'Layla and Majnun', a story of star-crossed lovers said to have been the inspiration for 'Romeo and Juliet'.

Bringing just this one scene to life took 26 stage management staff working in unison on the stage, all on full duplex wireless comms, with a further 54 full duplex wireless comms packs and around 25 wired packs under the stage as its own separate system. The comms system as whole was vast; over 1000 two way-radios, more than 200 IP-enabled intercom panels, and hundreds of belt packs. It was one of the largest communications systems ever used in a live event. The biggest technical challenge was how to make 80 full-duplex wireless comms packs work in the same place. "It had never been done before on that scale," said Nick Eltis, Senior Technical Director for the ceremonies for creative and production firm FiveCurrents. "We have often tried to do big full duplex wireless systems and it has literally never worked, as the technology hadn't been reliable enough."

Radio Free Europe

Carving out a safe operating spectrum for such a large wireless system was a long process that involved the technical team from FiveCurrents, The P.A. People and the Azerbaijani government. "We did the initial spectrum plan and allocated how many duplex and simplex channels we needed, as well as radio microphones, in-ear monitors, WAPs and anything else with a frequency", said Carl Gosine, the game's Technical Director - Systems, for FiveCurrents. "It was all put in a spectrum allocation chart. That was sent to the organising committee and to the government. We put in our first spectrum request in September. New TV stations started coming on-line in January and we had to go back and say 'this is affecting our spectrum'. There was a lot of back and forth."

The final piece of the RF puzzle was solved by splitting up the full duplex systems. "In the end, we used two Freespeak II systems in two different frequency bands," clarified Chris Dodds. "With the support of the Azerbaijani authorities, we were able to operate one system in one local license band and the other outside of that. With the two systems co-located, we could achieve the desired 80 packs in one physical RF space to the satisfaction of all. It was a great achievement."

Speaking Freely

The P.A. People solved this technical difficulty by using Clear-Com's new Freespeak II DECT wireless technology. DECT functions in the globally license-free 1.880 to 1.933GHz range. "The production crew did not include full duplex on the original specification," recalled The P.A. People's Managing Director Chris Dodds, "but as the artistic component of the event developed, and after we had been appointed as contractor, it was determined that a full duplex solution would constitute a significant advantage for the Ceremonies."

"The Freespeak II system was flawless," commented Nick Eltis. "It was literally perfect. There were 26 different talk groups and a global talk group for the stage management team and tech crew running the scenery on the revolve, and it was perfect." Fritha Truscott, the games' Associate Show Producer - Show Control, for FiveCurrents, was in charge of the team under the stage. "I had a staff of more than 65," she explained. "A fifth were local stage management and 18 were employed just for the opening ceremony as the 'block captains' on the revolve for the 'Miniatures' section. The comms we had on the revolve were extraordinary. I have never been on such clear-sounding comms. I had all these locals out there, that had never done anything like this before, doing their own mini show-call on each section of the revolve, and I was able to communicate with them clearly. It was awesome."



The Network

The entire comms system in Baku was delivered over a large Ethernet network. The P.A. People deployed 20 fibre connected network nodes in and around the venue, including one at the Bulvar Cauldron in the city centre some 10km from the venue. "Our philosophy is to create a network centric environment and to deliver and connect all of our comms elements over that backbone, including the matrix systems themselves, matrix keystations and partyline belt packs, CCTV cameras and viewers, timecode displays, cue lights, file and print services, and audio. Not only do we deploy our services across the network, but we also monitor almost all our sub systems using IP and SNMP technology, from the radio bases to the UPS's and everything in between" commented Paul Barrett, The P.A. People's Senior System Engineer for the project.



Clear and Clean

It wasn't just Clear-Com's Freespeak II that made it into the stadium's comms system. A huge range of equipment from the brand was used, including two Clear-Com Eclipse HX-Omega Digital Matrix systems, two Eclipse HX Median Digital Matrix frames, fifteen HelixNet Master Stations, one hundred and fifty HelixNet Beltpacks, and more than two hundred Clear-Com V-Series Intercom Panels. Clear-Com even provided two support engineers to ensure that everything ran smoothly with their gear. "This was another in a long line of great collaborations with The P.A. People," said Bob Boster, President of Clear-Com. "We really have a great partnership with them. They have highly trained and knowledgeable personnel who know exactly how to get the most out of the systems, as the deployment at Baku demonstrates."

Complementing the comms system, The P.A. People rolled out a site-wide CCTV system, providing a vital visual complement to comms audio. "We used our CCTV panel in the light booth all the time," said Travis Hagenbuch, Lighting Designer for lighting design group Full Flood. "We used it to help focus lights in places we couldn't see, we used it to mimic some TV camera angles, and even to check smoke machines under the stage. Not having to send someone to do all those things helped save a lot of time."

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MADI Integration

Another standard requirement in Baku was the need to interface with the Broadcast Trucks, but at the time of shipping the systems from Australia the Broadcast vendor was unknown.

Since the number of intercom circuits was an unknown, the The P.A. People decided to provide a MADI interface card from ClearCom as the solution. The MADI card fits in a ClearCom Eclipse HX frame, and provides a single 64ch MADI interface over either a fibre and/or a coax interface. A significant feature of the ClearCom implementation is that unlike other vendors designs the ClearCom card uses separate clock inputs and sample rate converters, both ways providing flexibility and independence from the other system.

"The P.A. People proposed the MADI solution rather than the more traditional analog four wires that we have used in previous Ceremonies. The system worked flawlessly with sixteen discrete 4 wire circuits between our Ceremonies system and the system in the Broadcast trucks. It was simple and elegant", said Ian Cooper, Technical Manager - Audio & Communications for Five Currents.





Two Way Radio bases

Similar to many aspects of the Baku Ceremonies, the sheer number of Two Way radio bases in itself was remarkable. The main system for the Stadium comprised some 40 duplex radios and 56 simplex radios each of which was coupled to a complex multi-coupling and filtering system. Commissioning this many channels and getting each of them to perform optimally would be considered a remarkable achievement in any location, let alone for a ten week temporary deployment 8,000 miles from home and jammed in amongst a whole heap of TV channels and other unknowns. "You just can't do this level of work without high sensitivity radios, quality multi-coupling equipment and the right test gear - it just results in poor coverage and interference which is simply unacceptable" noted Campbell Waller, Project Manager and RF Engineer for The P.A. People.

Perfect Timing

Synchronising playback, lighting, cameras and cues involved displaying SMPTE time code throughout the control rooms and in other system control locations, another responsibility that fell to The P.A. People. "Our time code solutions are distributed over an Ethernet backbone alongside IP key stations and the CCTV system" commented Scott Davidson, who managed the equipment deployment in the control rooms for The P.A. People. "For this ceremony we added a new network based cue light system to assist stage management where a stage manager may not have been able to get close enough to a cast member to provide a reliable cue."

Ted Wells, a Senior Lighting Designer with Full Flood, is a veteran of massive sporting events, and now knows The P.A. People well. "Baku was the second time I've worked with The P.A. People team," he offered. "The first was at the Winter Olympics in Vancouver. Both times the comms clarity has been excellent, but Baku was exceptional. I couldn't get over the clarity; no operator said they couldn't hear me! The clarity was the best I've ever experienced, and my colleagues expressed the same opinion. We had 26 positions for follow-spot around the stadium and had no problems at all understanding and communicating. There was no static and no buzz. Follow-spot operators are dependent upon cues, and for me it means they're on-point if they can hear you. I can't say enough positive things because this is what makes the difference between a good show and a great show."

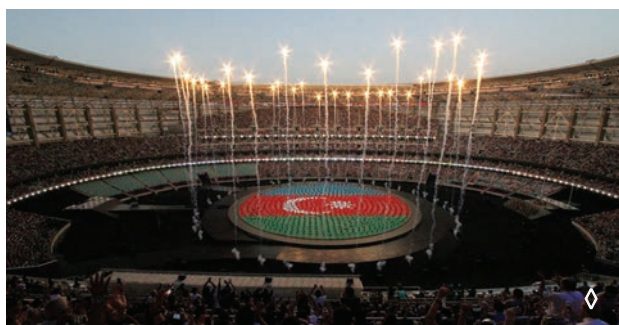
The symbols located in the bottom right of each image indicate photo credits for: ◇ Jo Nisbet and ∞ Chris Dodds



Lines of Communication

Travis Hagenbuch concurred. "Everything supplied to us worked flawlessly, was flexible, and was intuitive to use, and I've never seen a comms system this large and complex. The integration of all three of Lighting's radio channels into the headset panels was a life-saver when trying to talk to the crew and find someone quickly - that's a feature I wish was on a lot more shows. The P.A. People's staff made communication on this project effortless. There was always a quick reply on the comms channel, and help was always quick to come if we needed anything, even up to our 6th floor booth. The importance of good communication multiplies with the scale of a show this large, and we were very happy with the system and support we had."

"Communication is everything. If you can't talk to the people you need to talk to, you can't do your job," observed FiveCurrent's Fritha Truscott. "The best thing about The P.A. People is their people. Everyone's willing to do whatever they have to, to make it work for you. There was always a raft of comms technicians listening to every word I said, so if I said 'Sorry, I can't hear you' someone immediately popped into the room to make sure there wasn't an issue. It's about response and customer service, and they're the best."



Delivering Complexity, Simply

FiveCurrents are no strangers to this scale of production. Their recent portfolio includes London and Sochi Olympics and this Northern Summer they also produced ceremonies in Toronto and Los Angeles. "Using the comms system in Baku was a superior experience; a super-integrated solution" said Scott Givens, President of FiveCurrents. "We work all over the world - and having a turnkey system that works - is essential" he said.

"These are very big, very complex systems," FiveCurrents' Nick Eltis pointed out. "One part of delivering on a project like this is having the gear, another part is having an understanding of the technology and how to make it do what we need it to do, and the third part is all about customer service. The P.A. People understand that you can have all the greatest hardware and technology in the world, but if you don't service the end-user, there's no point. Comms is all about end-user experience, and The P.A. People know how to make that a good experience."

"There's not a lot of people that can deliver the scale of system we needed," added FiveCurrents' Carl Gosine. "While we needed a system that was very robust and very flexible, the equipment is just equipment. When it comes down to a communications company, it's having people that can work with others that makes them strong. The P.A. People's staff are great to work with. They were flexible when we needed them to be, and provided some very good solutions working with our team. They came with a positive attitude in order to get the job done, across the board, for everybody."

Scott Givens continued "the service level and personnel from The P.A. People is the key. It's definitely something I saw with you guys - working with our team in Baku in pre-planning was great; there was nothing that was left out and the system had all the resilience; it delivered - PLUS."



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