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Safety And Spirit

FIFA World Cup Scores With Converged Audio And Life-Safety Systems

BERLIN AND MUNICH—The FIFA World Cup 2006 chose Germany to host the battles of footballers this year. Two of the major stadiums—the Allianz Arena in Munich and the Olympiastadion in Berlin—chose Telex for what the company considered to be a "total system solution" approach to life safety and sound reinforcement.

Electro-Voice and Dynacord life safety, paging, and pro sound systems are in place in compliance with the stringent European EN60849 standard for the use of sound systems for emergency purposes. Telex Communications, recently acquired by Bosch Security Systems, reinforces the belief held by many in this industry about the convergence of entertainment technology and building technology in being a major pro audio company able to provide pro sound products with which a stadium can be evacuated and still be compliant with EN60849.

The installations at the Olympic Stadium in Berlin and Allianz Arena in Munich are shining examples of how to sound great whilst ensuring the safety of tens of thousands of fans.

The system at the Berlin Olympic Stadium is comprised of a Dynacord ProMatrix (ProAnnounce in the U.S.) life safety system, 171 XLC127+ line array boxes, and 38 P1200RL, 43 P3000RL, and two P900RT remote-control amplifiers running IRIS-Net software. The historic stadium is complemented by a vast steel framed canopy, inside which the amp racks and XLC arrays are mounted in specially designed weatherproof enclosures.

The star of the system at Munich's Allianz Arena installation is its network of 23 EV NetMax N8000 digital signal routing, control, and monitoring units, which integrate an unprecedented level of sound reinforcement and life safety flexibility. While at the same time it offers connectivity into the stadium system, comprised of 82 Xf, 72 Xi-2181, and 96 EVID 6.2T loudspeakers; four P900RT, 14 P1200RL, and 53 P3000RL amplifiers; 49 Dynacord DPA4245, 68 Dynacord DPA4260, and seven Dynacord DPA4140 amplifiers, and one Midas Venice 240 console.



Oliver Sahm leads a tour of the intricate audio and life safety components in the Allianz Arena, a completely new build in Munich, Germany. This along with the Berlin Stadium were two big projects led by Sahm, EVI Audio's project and sales manager for permanent installations in Europe.

SPEAKING WITH THE PROJECT MANAGER

Oliver Sahm is EVI Audio's project and sales manager for permanent installations in Europe and here he documented many of the groundwork details on the projects as he was at the epicenter of these installations.

ALLIANZ ARENA, MUNICH

Who was the designer of the system?

Oliver Sahm: The actual system design was done by myself and EVI Audio. We did the acoustic design, EASE simulations as well as the network design. We had a functional description and requirements from the general building contractor and from the general electrical contractor.

Was there a bidding process? How did Telex win the bid?

Yes, there was a bidding process when the general electrical contractor was looking for a subcontractor for the sound system. Telex won the bid because of its integrative approach for PAVA and ProSound, the unique combination of Dynacord and Electro-Voice components, and because the general building contractor was convinced about the sound quality. Additionally Telex fulfilled all international requirements for life safety (e.g. EN60849) and FIFA specifications. We had very good references, especially with all the installations for the Summer Olympics in Athens 2004.

How long of a process was it from concept to project completion?

The very first concepts were designed and calculated very early, long before the official bid. After the general architectural competition for the building, we have been out of the process for a while. Then we had an inquiry from the general building contractor because of a press article about the sound system installations in Athens for the Olympics. So we came back into further negotiations. The contract between the general electrical contractor and Telex EVI Audio was signed in November 2004. The commission to the owner was set to the end of April, thus we had only five months for the final design.

Describe why each of these systems are the best suited for the application.

The system in the Allianz Arena is completely custom tailored. It is a perfect integration of ProSound and PAVA life safety system. Every operator has the interface he is used to having or what he wants to have: the fire fighter has a simple push to talk microphone with more or less general zone selection. The police and security officers have big paging consoles with a detailed zone and group selection, to make dedicated announcements to individual zones. The paging is operated similarly by the ProSound and by the life safety system. Vice versa the operator in the sound control booth is used to having a mixing console and a touchscreen to operate the sound system. He can operate the bowl ProSound system like he is used to operating a concert sound system and additionally he can send up to seven different signals like BGM to individual assignable and adjustable zones, which are normally only paging zones.

At the same time the whole system provides outstanding remote control and detailed supervision. The detailed system check of the remote amplifiers gives information about every single loudspeaker component. The acoustic design provides even coverage and high enough SPL to overcome the fan noise. The speech intelligibility is very high, even in the empty stadium. Additionally the frequency response is very wide. Each mid/hi

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system has a double-18-inch-subwoofer to extend the low frequency range reproduced.

What do each of the control systems do (Dynacord, ProMatrix, and EV NetMax?)

The Dynacord ProMatrix is the heart of the life safety and paging system. The EV NetMax is an audio extension and the heart of the ProSound part.

The DPM 4000 processors are interconnected via data interface, dry contacts, and supervised audio connections with the N8000 controllers. So the whole administration and supervision of the paging consoles is done by the DPM4000s. If the permission for a call is granted by the DPM4000 master of the paging system all other DPM4000 processors have simultaneous control over the paging and priority matrixes in the N8000 processors to organize the audio routing accordingly.

The priority matrix is a unique software element of the IRIS Net software in the N8000 controllers. Status and failure messages can be exchanged between the N8000 and the Dynacord ProMatrix system, thus the operator at the PC with the IRIS Net software could have messages from the paging and life safety relevant signal paths on his screen, the operator at the Dynacord paging station can have a status message or the message "ProSound failure" for example in his plain text LC display.

The Dynacord ProMatrix has all the responsibility of the paging aspect. The EV ProSound combination of N8000 and the remote control amplifiers have the responsibility for the whole ProSound aspect, like audio networking.

OLYMPIASTADION, BERLIN

Who was the designer of the system?

Telex had started to work on systems designs in the year 2000 already. But the consultants and contractors relations changed several times. So the official tender was released with a decentral design: mid/hi systems at the front edge of the roof, fullrange delay loudspeakers flown in the rear part of the roof and directional subwoofer arrays in between. The design which was used for the installation was based on the good experience TSE [the subcontractor for the sound system] had with EV line arrays before. TSE supported by a German consultant and acoustician, Dr. Anselm Goertz, had the idea to use EV XLC line arrays in the way they are installed now. The detailed system design was verified and counter calculated at EVI Audio in Straubing, Germany. EVI Audio also coordinated between the loudspeaker engineering and the contractors for the custom modifications on the XLC line array cabinets.

With respect to the sound emissions and as acoustic and scientific consultant for the town of Berlin, the acoustic consultant ADA, Dr. Ahnert, was involved in the project also. **Was there a bidding process? How did Telex win the bid?**

TSE in Berlin won the bid, as dealer and partner from Telex/EVI Audio. The unique approach with line arrays in combination with EV remote controlled DSP amplifiers convinced the general contractor for several reasons:

1. A very good acoustic concept with non-distributed loudspeaker arrays, to provide the sound reinforcement from single line array sources for the whole upper and lower tier. The loudspeakers could be integrated perfectly into the roof. A very even coverage with good speech intelligibility.

2. Fulfillment of all life safety regulations to use the ProSound system for Life Safety PA as well and fulfiling the FIFA specifications for sound performance at the same time, when the requirements for reducing the sound emissions were fulfilled.

3. The detailed remote control, supervision, and system administration in combination with decentralized audio DSP in the EV remote control amplifiers.

What sound systems were in place before being upgraded to the new systems?

The Olympic stadium in Berlin was completely renovated and had no complete roof before. The old sound system was used for paging and announcements only. It had not been used for entertainment. For bigger events like American football, TSE provided sound with ground-stacked EV X-Line systems along the 400-meter running track on a rental basis.

The new installation could make use of a completely new roof. The system performance requirements have been completely new: wide frequency response, high SPL, good speech intelligibility, very good music reproduction, and speech sound reinforcement for entertainment and PA. **How long of a process was it from concept to project completion?** The very first design approaches and contacts to consultants were made in the year 2000. The official bidding process took place in summer 2003. TSE got the contract and Telex/EVI Audio September 2003. The official opening of the stadium was July 31, 2004. The sound system installation was one of the earliest accomplished.

Describe why each of these systems are the best suited for the application.

The complete new approach with more or less horizontally flown line arrays did incorporate several advantages:

The sound is provided over the whole frequency range from a consistent sound source at only 19 locations in the roof, high enough SPL inside, good speech intelligibility on all audience areas. At the same time the requirements to minimize the sound emissions were fulfilled. The line arrays provide a good backwards sound pressure level damping and a very well defined coverage to the front without lobbing effects or unwanted interferences.

What do each of the control systems do (Dynacord, ProMatrix, and EV NetMax?)

For Berlin, Telex delivered the ProSound loudspeakers and amplifiers. The network was done with Optocore components, the mixing console is a DiGiCo. Effect sound processing like the surround sound is processed with BSS Soundweb 8088 processors. The whole signal processing, which is relevant for the correct function of the line arrays, is done in the EV remote control amplifiers. The life safety PAVA in all internal areas was installed by a competitor (Siemens) with a competitor's product (Variodyn 3000). But they needed an interface to the ProSound system which is fulfilling the life safety standard EN60849. That's why a Dynacord ProMatrix is used as interface between both worlds: EV ProSound and competitor's PAVA. >EVI Audio...www.eviaudio.com

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