

## Master of ceremonies

State-of-the-art audio networking technology got Turin's Winter Olympic Games off to a stunning start. Dan Goldstein reports

**ITALY:** A fashion parade, Euciano Pavarotti, messages of world peace from men in smartly tailored suits, and enough moving lights to illuminate a hundred nightclubs... It could only be Italy, and it could only be the opening ceremony of the 2006 Winter Olympics. These days, no major sporting event is complete without some kind of festive inauguration, and somehow, nobody arranges this kind of thing with quite the same panache as the Italians. Who else, after all, would completely rebuild a crumbling inter-war football stadium merely to host opening and closing cere-



A D5 was used during many of the ceremonies in the Medals Plaza

monies, with no actual sporting events taking place there in between?

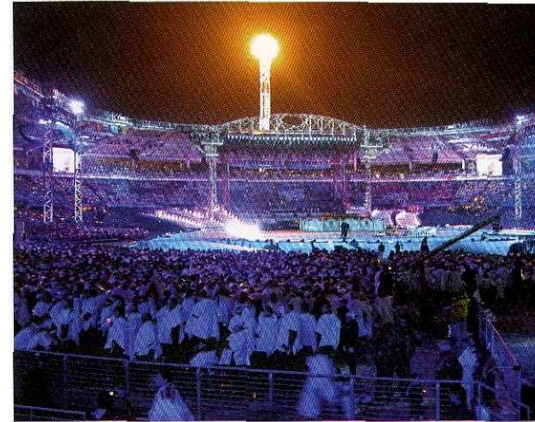
The arena in question is Turin's Stadio Comunale, a classically oval-shaped football ground designed in 1933 and completely rebuilt for the 2006 Winter Olympics, with entirely new seating areas and a new roof - only the listed facade of the original building remains. The new stands have given the stadium (now renamed the Stadio Olimpico) a capacity of 25,000, and for the opening and closing ceremonies this was extended by the provision of 6,000 temporary seats, constituting a heart-shaped VIP area at pitch level towards one end of the arena's oval. At the other end was the stage from which some of the ceremonies' biggest names performed, while in between, an extended, tongue-shaped temporary catwalk was erected to act as a platform for ancillary performers and the parading Olympic teams. Once the athletes had completed their parade during the opening ceremony, they congregated in a 'mosh pit' between the catwalk and the VIP seating.

The audio show designer for the opening and closing ceremonies, Gary Hardesty of Sound Media Fusion, originally conceived a conventional FOH system which would have seen line-array clusters hung either side of the stage, with additional clusters being flown at various points further down the arena, each one being given an appropriate delay. However, according to Daniele Tramontani, engineer for L'Aquila-based rental company Agora, which supplied much of the sound and lighting equipment for the ceremonies: "This idea was rejected by TV broadcasters who didn't like the idea of large numbers of loudspeak-

er boxes being close to or around the stage. The solution was to adopt a distributed design, with line-array clusters being hung from gantries around the stadium and further clusters and associated subs being installed at pitch level for content delivery and performer monitoring."

As well as providing appropriate sound levels for these multiple zones over a 360° area of coverage, the ceremonies' audio network also had to supply broadcast feeds for radio, television and the internet. Such a complex system required a very robust distribution network, and Hardesty's solution was to deploy a 1Gigabit fibre-optic Ether Sound backbone, with eight distribution zones supported by 1Gb and 100Mb Cat-5e cable. Data traffic and network redundancy were managed by DLink Ethernet switches and transceivers using the Spanning Tree Protocol (STP), by which full network redundancy is maintained at all times - should any item in the network fail, the backup network automatically replaces it, with no noticeable delay between the two.

POM digital audio data was transmitted across the network via EtherSound-enabled devices from Digigram. Some 15 Digigram ES881 S-channel AES/EBU digital-input Ether Sound interfaces were used to transmit the source material onto the network and extract it as needed for broadcast or live sound reinforcement, along with six 8-channel analogue-input ESSiii Ethernet Audio Bridges and eight analogue-output ESSout Ethernet Audio Bridges. A pair of two-channel ES220-L EtherSound network interfaces, user-switchable as analogue inputs or outputs, were also used. Agora sup-



The opening and closing ceremonies were held in a rebuilt sports arena

plied all the equipment and Tramontani did the detail audio network design and management for the EtherSound network, with the technical support of Marco Cappellotto and Dario Sari from Digigram's distribution partner for Italy, Prase Engineering.

The main speaker system used for the ceremonies was the unusual 'high-definition' line array which Hardesty designed for Panasonic, first used for the Athens Olympics of 2004. For the playing field, Hardesty and his colleague Rob Hunt deployed MILO and MICA arrays from Meyer Sound, supplemented by 700HP subwoofers from the same company which were hidden within the stage structure. Forty units of Outline Butterfly CDH 483 Hi-Pack were used alongside the five Olympic 'rings' to provide additional reinforcement.

Each of the system's 45 loudspeaker clusters was given its own XTA DP226 speaker processor, fitted with optional AES/EBU digital input interfaces to ensure that the signals from the EtherSound boxes remained in the digital domain throughout their journey around and across the stadium (the most XTA units for any one event). ...