

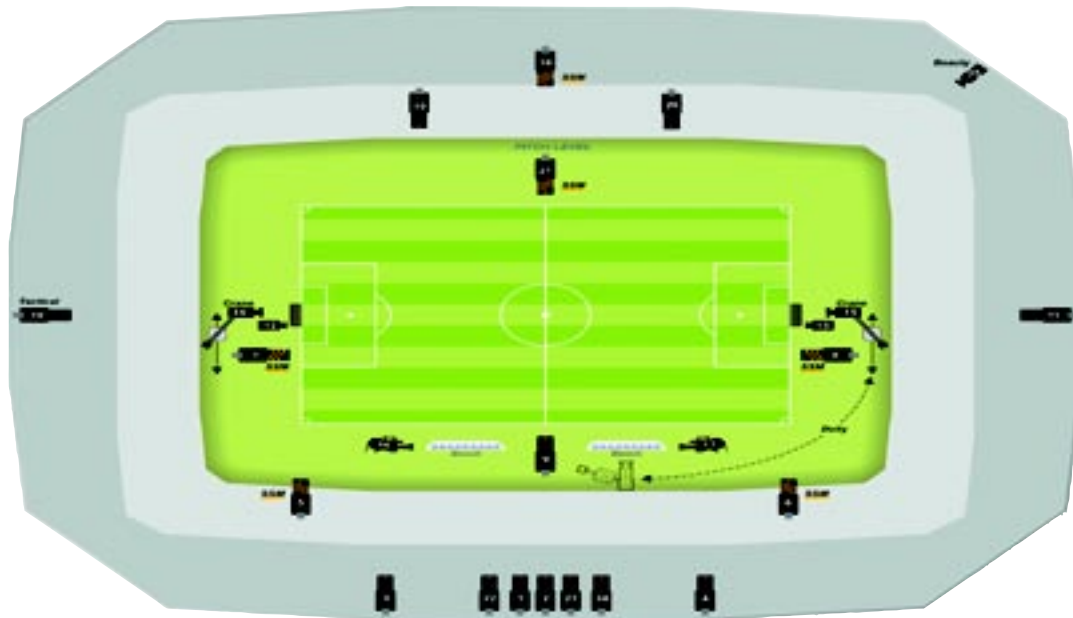
# Putting the World Cup in the net

The 2006 World Cup is done and dusted and people all over the world are getting back to a semblance of normality. However, the sporting triumph overshadowed the technical achievement running beneath it all with HD and multichannel firsts and the employment of the world's largest audio routing system. Lawo had an integral part to play in the event's infrastructure, **RESOLUTION** looks at the technology.



**H**OST BROADCAST SERVICES (HBS) chose Lawo to provide a complete audio network system that linked commentator booths at the 12 World Cup stadia to the International Broadcast Centre (IBC) in Munich for the 2006 FIFA World Championship in Germany. HBS, as the 'host broadcaster', was responsible for organising the TV broadcasts for the World Cup games and the required technical infrastructure. Lawo took on responsibility as the main contractor and the technical equipment required was supplied to HBS on a rental basis and to manage this rental business Lawo founded a new company called Audio Broadcast Services (ABS). After the event, ABS took over Lawo's used equipment and will market it for other large events to satisfy rental demand for routers and associated I-O from TV stations.

For the first time, HBS produced the TV broadcasts of all games completely in HDTV and multichannel sound. The HDTV signals were transferred uncompressed from the stadia to the IBC via a network supplied by T-Systems Media and Broadcast. Some 200 commentators in the press galleries of the stadia reported live during the games and every commentator was provided with two incoming and



two outgoing lines. One line was used for the live report via microphone, one line supplied the commentator with the studio feed and live sound via a headset, and one bidirectional line pair was provided between the commentators and their respective home TV or radio station.

All commentator lines were supplied via Lawo's Dallis I-O systems and in every stadium these lines could be freely distributed using a Lawo Nova73 HD routing system with a capacity of 8,192 mono channels. These routers also handled signals that were transferred via ATM to the IBC and, from there, were distributed worldwide. OB vans at the stadia could also be supplied directly with signals on demand from the commentator booths.

In addition, Lawo furnished the IBC with two mc<sup>2</sup>66 mixing consoles that were used to produce Dolby 5.1 and Dolby E surround signals from contributions supplied for the worldwide feeds; a stereo mix was also simultaneously generated. The TV broadcast audio was embedded in the video signal before transfer.

The audio installations in all the World Cup stadia were identical although those in Dortmund, Munich and Berlin differed in accommodating more commentator positions because of their use for the semi-finals and finals. The hardware consisted entirely of standard components from Lawo and in cooperation with HBS the manufacturer developed additional software for the control system. This software was linked via a special interface to HBS' bookings and management software, which was used for the processing of client orders.

The complete Lawo installation was monitored with the help of more than 30 TFT-based workstations. Two of these were installed in each stadium with a further four at the IBC. The system was presented to the user as a single large router, which was used to control and switch the commentator's positions and with 19,200

x 19,200 crosspoints it could be considered as the largest audio routing system ever created.

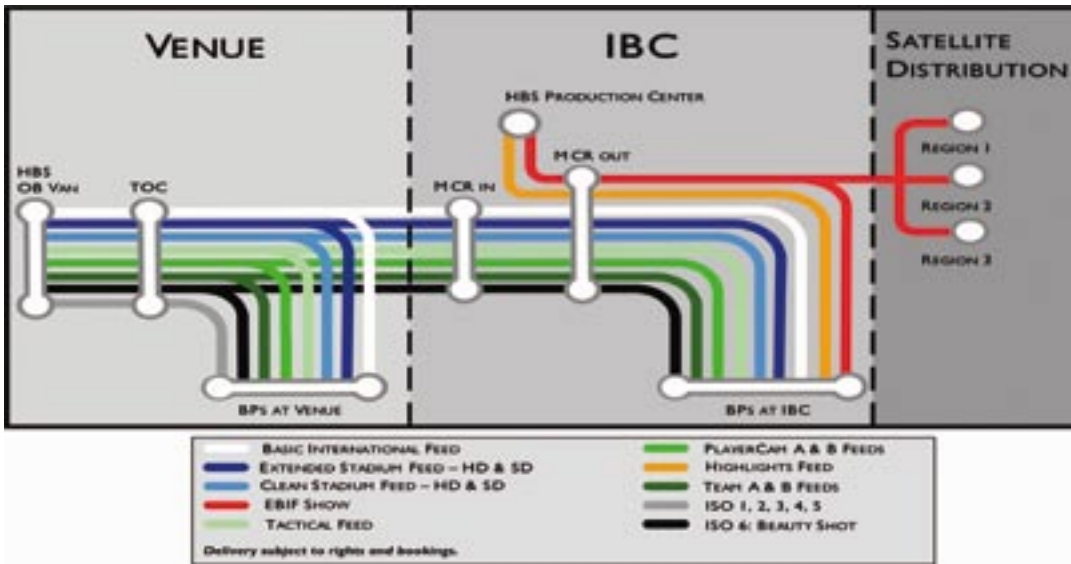
The entire audio network was controlled at the IBC using a workstation with a simple touchscreen interface. Any switched connection was seen immediately on all the other workstations, which were operated by HBS technicians. All the commentators' PCs were connected to a networked server system.

Each stadium had two commentary control room managers in addition to a group of technicians and trainee students for whom HBS, in partnership with German universities and technical institutes, offered practical training. This is standard HBS practice at every large event in all host countries.

The flexibility of all the systems and networks used for the 2006 Soccer World Championship played a central role for HBS and this related particularly to the high-speed lines provided by T-Systems Media and Broadcast, on which the audio installations were based. 'Also with Lawo we found a very reasonable redundancy solution,' says HBS CEO Francis Tellier. 'It is important to us, for example, that we can simply replace defective audio boards during operation, without the system being affected. Luckily, all the Lawo boards are hot-swappable.'

The Lawo HD cores were also designed with complete redundancy and integrated two router modules, and all I-O units supplying the core provided a so-called additional port-redundancy connection. Every I-O unit also had two optical fibre connections to the core to achieve maximum flexibility with only one core.

'Of course, there were alternatives to Lawo,' admits Tellier, 'but at the end of the day it was Lawo's technical concept, particularly the computer-based switching possibilities, which replace traditional manual patching, that convinced us. We are also very satisfied with Lawo's redundancy solutions, the number of router ports and the outstanding quality of

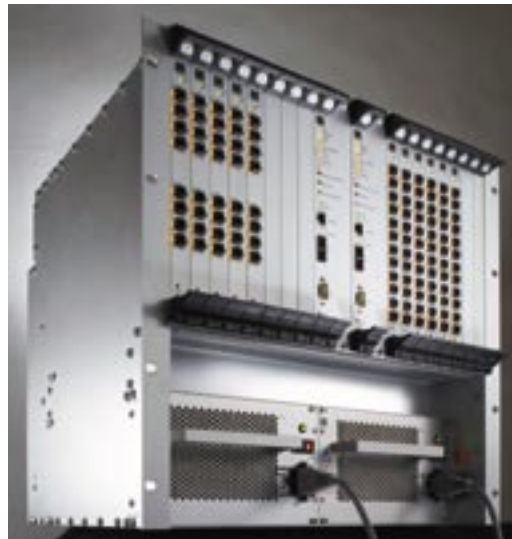


Signal distribution

the audio signal transfer from commentator booths in the stadiums to the IBC. Altogether this is a very good technical solution which, in addition, is even cost-effective.'

HBS and Lawo co-operated in June of last year during the Confederations Cup in Germany. Then the installations were restricted to two stadia: one Lawo Nova73 HD router and one Lawo Dallis I-O system were installed in the football grounds in Cologne and in the Broadcast Centre at the Frankfurt stadium. The ATM connection between the two venues had a redundant design. This installation provided HBS and Lawo with a kind of test setup for this year's World Cup — they had already used part of the line infrastructure, supplied by T-Systems, in the 2005 test.

Dallis units, with AES-EBU and analogue audio interfaces, in combination with the Nova73 HD routers



Lawo Nova73 HD router



transferred audio data with automatic bidirectional switching via the redundantly designed ATM connection from Cologne to Frankfurt. The matrices were optionally controlled locally in the stadium or centrally from Frankfurt. A Lawo mc<sup>2</sup>66 was tested for 5.1 surround sound. According to Tellier the tests underlined the capability and conceptual advantages of the individual Lawo products, as well as the overall solution. However, he doesn't want to over-evaluate the use of Lawo for the ConfedCup: 'The large audio network that we now have from Lawo is far from being comparable to that used in the ConfedCup installation. And it is also the first time that we have a complete Lawo solution in use at a Soccer World Championship,' he says.

The technical installation at the IBC started in early March, followed by extensive cabling and the setup of all other systems. Audio cabling in the twelve World Championship stadia was carried out in May, and by the beginning of June everything was ready for action. A warm-up match in the Munich Allianz Arena was the occasion for a successful functional test, which also served as a demonstration of the technology to all the broadcasters participating in the Championship.

Since then, the games have started and finished with most of the world watching them on TV. And it has to be said that they sounded pretty good. ■