## DOME AND STUDIO RECORDING

Sony's Andrew Hingley (L) and sound designer Chris Hey with the Sony OXF-R3

# Slow motion, fast food

DOME INVOLVES COMPLEX SURROUND PANNING – FOR WHICH ITS SOUND SCULPTORS HAD TO ENDURE NOCTURNAL SHIFTS, AN IMMOVABLE DEADLINE AND INSTANT BURGER BARS. PHIL WARD AND DAVID ROBINSON DONNED HARD HATS TO GET THE HARD FACTS

Beneath FOH: racks of Digidesign I/O, MADI cabling, BSS control

Visitors to London's Millennium Dome this year will find among its attractions a live performance in the round – in a circus-like ring at the epicentre of the structure – combining dance and *son et lumière* elements to the accompaniment of pre-recorded music.

That this music has been written and recorded by Peter Gabriel will please countless fans: that it was mixed in surround actually inside the Dome only a few days before its completion will probably be lost on them, but is astounding nonetheless.

The Gabriel show runs for around 40 minutes three to five times a day, for the duration of the Dome's life in its present form: the year 2000. The sound reinforcement, designed by Spenser Hey Associates' Chris Hey, is elaborate to say the least. Hey suggests one thinks of the Dome as 12 wedged-shaped cinemas forming a circle, each with its own 7.1 mix. In addition, 360° panning movement effects around the whole room are possible, plus 'Z-plane' movement to a cluster flown in the roof.

When the Dome is operating normally, 40 tracks of audio are played back from five DAR OMR8 hard disk recorders, piped into a BSS Soundweb and then routed to the various Funktion One speakers around the structure.

Unique in the preparations for the show was the on-site audio mixdown: fifty-six tracks of audio from a Pro Tools rig were mixed through a Sony Oxford OXF-R3 console and recorded to the 40-track master. For several weeks at the end of 1999, the Dome was the biggest studio control room in the world.

"We all wanted to mix it in situ, because the acoustics of the average control room vary marginally from the Millennium Dome," says Hey, who manages a joke even though he worked through the night right up to the New Year deadline under enormous pressure. All of the audio preparations took place overnight, when most of the hard hats were hung up. "Because it was a building site, it was rather noisy, so working at night was the only option," Hey points out.

The Sony Oxford was nominated as the mixdown console at an early stage. "We mutually agreed it would be an extremely desirable way of doing it," says Hey. "Not least because it's the same desk they have at Real World and they could bring their automated mixes over on disk.

Real World were doing preliminary mixes, bringing them over, we pressed go and then we could update the mix to accommodate the change in acoustics."

As a live/studio hybrid – part mastering, part soundcheck – the mix was performed by Gabriel and his long-standing engineering partner Dave Bottrill, representing the 'studio ears', in conjunction with Hey and FOH engineer Huw Richards, inputting their live experience.

At Real World Gabriel, with Mike Large, Dickie Chappell and Richard Evans, recorded onto a 64-channel Pro Tools systems (with a 48-track HR backup), and dispatched 56 channels to the Dome on the system's 18Gb removable hard drive. Some 5.1 monitoring was carried out at the Wiltshire studio, but only for "very rough" mixes, according to Real World's Owen Leech. Little was re-recorded in Bath in light of the vastness of the Dome, though there was some re-EQ'ing – and an ambitious placing of the studio monitors "as far apart as possible" according to Leech. The studio has recently installed a 5.1 system comprising three KRK E8s and two KRK E7s.

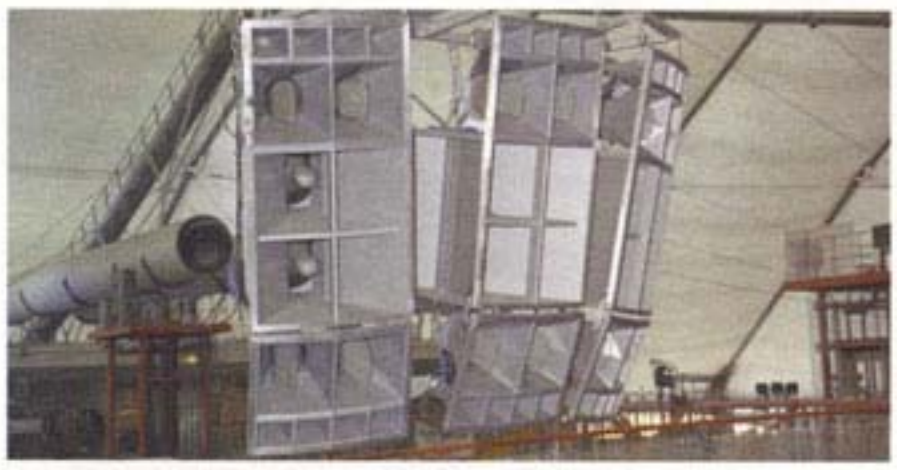
Once in the Dome, the hard drive was reunited with seven banks of Digidesign 888 I/O, its 56 channels then routed internally to one MADI cable, and on to the OXF-R3.

Reportedly the Oxford, running newly-upgraded software, performed perfectly throughout the run-up. "And we had to turn it on and off several times too because of construction-related issues, which is not what you'd ideally do," adds Hey.

For the 360° sound and the Z-plane placement, signals were routed to an Out Board Electronics TiMax system and an Ambisonics controller. "The Z-plane was a little problem because nobody makes a 3D controller – so we just turned the processor sideways and used the X as a vertical," says Hey. From here the audio was fed to five DAR OMR8s, where the 'musical' groupings of Pro Tools were 'geographically bounced' for the Dome. Of the 40 tracks operating now, six carry the sound for each 'wedge': L, LC, RC and R boxes are flown from a central sway pole, with additional flown 'pods' carrying the rear left and right. (The seventh channel of the 7.1 is derived from the rear two.) The bass – the '.1' – is pumped out from subwoofers located beneath a central performance platform.

There are 12 tracks for the 360° placement, one for each wedge, and another 12 for delayed sound to additional pods further behind the audience seating. There is also a mono feed for truss in-fills, while another feeds fills covering hot spots around the stage. Six extra cue tracks have been especially created for the show's performers, who are wearing in-ear moulds.

During preparations, the monitor mix at the Sony console was a collapsed version of the 7.1, to a pair of KRK E8s. This FOH setup is now, of course, long gone, as is the 'engine room' of playback and mastering gear which resided in a freight container lurking below the FOH position; here lay the TiMax, Ambisonics and Soundweb control,



**Funktion One delay speakers hanging in the Dome**

and the Pro Tools and DAR rigs. Left behind is the DARs, their data now locked; TiMax; Ambisonics; and Soundweb – each of which allows slight tweaking of room parameters as the weeks pass.

"Everything moves at the front – the stage opens up like the magical box at the beginning of *Camberwick Green* – and it all has to be adjusted for time delay," observes Hey. "All the bass is misaligned once this happens, so the bass is delayed back to reform the ring. Any changes in design or choreography will result in acoustic adjustments..."

Untitled, Gabriel's music comprises a prelude plus around eight separate movements. Which sounds very classical in structure, but another cultural dimension to the Dome is revealed by Real World's Mike Large, who has one abiding memory of the Millennium Experience.

"Dave Bottrill started part of the mix one Saturday night, and it took about four nights to complete," he says. "By that time, an entire McDonalds restaurant had been built from scratch behind the FOH position..." PSNE

**Additional hardware FOH**

Quantec 2402/F Yardstick (released at AES Munich)
TC 2290 digital delay
Lexicon PCM42 digital delay x2
Eventide H3000 Ultra-Harmonizer
Lexicon PCM91 x4
AMS RMX16 digital reverb
EMO Systems power supply
Tascam DA-40 DAT
Denon DN600F CD player
BSS Soundweb and Omnidrive
KRK E8 monitors