

NT + 10

NATIONAL THEATRE

A report on how the technical installation at the National Theatre has performed in ten years of use.

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Ten, nearer eleven, years ago Britain's National Theatre opened after one hundred and twenty five years of talk and ten years detailed design and planning. It was architecturally and technically ambitious, very different from the conventional nineteenth century theatres of London's west end but also, in scale and financing, from the post-second-world-war theatres built in the provinces. Three auditoria were built together with generous dressing rooms, wardrobe, workshops and offices to make a self contained theatrical kingdom with its own company and resources; equally able to stage new works or the classics on proscenium or open stage, to experiment in a studio space or to welcome visiting companies. After ten years the artistic achievements of the enterprise are on record for all to see and applaud, but how did the technical installations work out?

The technical innovations at the National were well reported during the building phase and the plans laid by the development team and theatre consultants Theatre Projects met with general approval, though mixed with varying amounts of doubt and envy. After the three auditoria had opened and the achievements were there, more-or-less, to be seen, the doubters were apparently proved to have been right, at least about the stage machinery. It wasn't ready and some said it never would be.

Now, ten years later, how much of the original technical installation has proved it's worth; how much had to be thrown out; and what could have been done better?

Lightboard

First, an undoubted success.

In the early 1970's when the choice of lighting control for the two main theatres had to be made, computer memory systems were only just gaining acceptance in theatre. Q-File led in the television world but it's adaption for theatre had not gone far enough in the eyes of many top theatre lighting designers. Strand's DDM and MMS were at a similar stage of development and the same seemed to be true of the very few overseas manufacturers in the business. So, since Richard Pilbrow knew what he wanted and since Strand, still smarting at the bite Thorn had taken out of their market, wanted to develop a new generation board, Theatre Projects wrote a specification and Strand

accepted the challenge. This is not the place for the story of that development: sufficient to record that the Strand team led by David Baker and Martin Moore produced convincing prototypes and the South Bank Theatre Board were persuaded to place the contract – the first of their affirmations of faith in British engineering and the new technology of the computer age.

Lightboard used a mini-computer, the DEC PDP-11, plus a lot of Strand made controls and interface boards. Innovations included the first theatre use of VDU data displays, formatted to avoid cluttering the screen with information about unused circuits; the option to compose lighting using individual dimmers (called sockets for clarity), groups of dimmers, and fully balanced memories all together on a 'palette' control; complex cross fades with up to twenty-four sets of lights starting at different times and moving at different speeds; a stalls control with full facilities; and a discontinuous socket numbering system that allowed, for example, sockets on Bridge 1 to be numbered 101, 102, 103 etc. and Bridge 2 to be 201, 202, 203 etc. Patching was avoided as a matter of principle with the result that there were 498 dimmers in the Lyttleton and 720 dimmers in the Olivier, plus houselight and non-dim circuits also controlled from Lightboard.

Lightboard worked and worked well and established a new high standard for dimmer memory control systems. The Strand Galaxy and Gemini of today owe everything to the precedents established by Lightboard. Not that it didn't have any faults. Two bitter lessons were learned. Control rooms and computer rooms must be properly cooled and mains supplies for lighting computers have to be well protected from the dirty waveforms generated by the dimmers. These problems were solved fairly rapidly, but the former probably left a legacy of overheated components that, by the mid 1980's, resulted in a growing maintenance burden for NT staff.

Maintenance

Maintenance was, of course, recognized as a special problem at the National. Two Lightboards plus a smaller control for the Cottesloe; computer controlled flying systems in both big theatres and the complex drum revolve in the Olivier could be expected to require more attention than

could be provided by operational staff or maintenance contracts. A special systems engineering department had to be organised and this was set up, a year or two after the complex opened, by Douglas Isham, a professional engineer, previously with the Royal Air Force. He set about organising staff and a maintenance policy appropriate to the complexity of the equipment and the intensive use generated by the repertoire system and long days and nights of rehearsal. His policy combined providing in-house expertise to solve routine problems, a generous holding of spares, full co-operation with manufacturer's maintenance teams and adequate installed backup systems that could be used to continue performance or rehearsal without serious disruption. Ian Napier, a systems maintenance expert was recruited to take charge of the details.

At first the problem of back-up for the Lightboard seemed straightforward. A ten fader peg matrix connected to every dimmer was provided in both control rooms and seemed good enough because the presumed high reliability of the computers, duplication within the control system, readily available plug in spares and the knowledge to use these effectively was expected to more-or-less eliminate sustained failure. And, with a few significant exceptions, this was the case for many years. However, computer manufacturers are notorious for making their systems obsolescent and as a consequence spares and the manufacturer's ability to repair even small faults became, during the early-1980's, progressively harder to obtain, putting a growing strain on the maintenance team. Nevertheless, since the Lightboard was highly thought of and since there seemed to be no satisfactory alternative on the market it was decided to improve the back-up.

Galaxy had been launched by then and this incorporated a sophisticated back-up panel. So, although in Germany complete Galaxy boards were installed as Lightboard back-ups, The NT settled on the Galaxy back-up alone, connected alongside the Lightboard and peg-matrix. Now, once rehearsed on Lightboard and copied into the Galaxy-backup, near perfect repetitions could again be guaranteed. A good idea that worked well except for one problem, it took a lot of time and trouble to manually copy the Lightboard memories into back-up and although a routine was set up to do this overnight