Lighting and a second s

Jubilee 2002

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Hooray for Bollywood

Bollywood has come to London Victoria in the shape of Bombay Dreams. Produced by Andrew Lloyd Webber's Really Useful Group (RUG), could this be the first blockbusting Indian musical production to hit the West End?

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For the splendid Deco Grade II listed Apollo Victoria Theatre, the coming of composer A R Rahman and lyricist Don Black's colourful, fast-moving extravaganza meant a complete refurbishment. Having hosted *Starlight Express* for 18 years - for which it had been specially adapted - the theatre was in need of a major technical and infrastructural facelift.

Central to this work (which included the removal of the skating track used for *Starlight* and the replacement of some of the seats lost to accommodate it) was the need for a complete electrical upgrade. *Bombay*'s production LX, Fraser Hall, was consulted early on and his input shaped the design of the new wiring and dimmer installation. One of the most visual elements of the upgrade is a massive LED lighting installation by Stage Electrics (see page 80) which is integrated into certain scenes in the new production, fusing auditorium and stage action together.

With much of the infrastructure in place, the *Bombay* production team moved in earlier this year. Leading this team were director Steven Pimlott and working with him were designer Mark Thompson, choreographers Antony van Laast and Farah Khan, lighting designer Hugh Vanstone and sound designer Mick Potter.

For Hugh Vanstone and Mark Thompson, the main challenge was in taking the barn-like auditorium space and the intimate story and somehow welding the two together. This task was made all the more difficult by the fact that the theatre was originally designed as a Cinetheatre - a cinema that would also stage some live entertainment - so is very small in terms of stage facilities, with a narrow grid and no wing space.

Undaunted the two set about researching the Bollywood genre. For his part, Thompson went to Bombay, where in a highly compressed schedule, he visited slums, temples, houses, TV studios, streets and a myriad of other locations. Working to a tight budget - for a musical his series of sets create tones and texturing for the piece, bringing numerous environments alive onstage - from the slum scene with its vast twinkling Bombay skyline trailing off into the distance, to the huge pillars and arches of the temples and the tall, imposing prison grilles. The centrepiece of the slum scene is a massive water pipe, curling around the revolve, on which people sit, chatter, gossip and put the world to rights. "It's not literally like India," says Thompson "But there's definitely an essence of it. The show is also Westernised and modern in many ways - it operates on many levels." There is a sense of the cinematic too, achieved by the large yellow box effect filled with vibrant pictures.

The show has numerous scenic changes and the automation for these comes from an Acrobat control system supplied by Stage Technologies, operated by Ian MacDonald. There are 18 axes of movement, including a scenery revolve track, curtain, trap, stage lift, the big prison scene and two large prison doors. The prison scene alone weighs 4.5 tonnes. The main down-stage curtains, (hung from Triple E Unitrack curved to match the shape and rake of the stage) are an integral part of the production. The Unitrack is powered by a Stage Technologies Big-Tow winch, mounted on the stage-right fly floor. The tight-squeeze rigging for the production was undertaken by Unusual Rigging Ltd.

For his part, Hugh Vanstone didn't get a trip to India to fuel his research, but based his interpretation on viewing as many Bollywood movies as he could lay his hands on and reading up on the culture and history of India's rich filmic heritage. With such an abundance of colour, the lighting design for *Bombay Dreams* is markedly different from much of Vanstone's previous work. Yet despite a seemingly blank canvas for creativity, "a shortage of space at the venue meant equipment chosen for the lighting rig had to be carefully thought through," he says. As a result, the small grid is tightly packed with a mixture of fixtures - all supplied by Vari*Lite Europe.

A thrust stage was included early on in the design process to eke a little more space out of the theatre, with a circular truss above,

THE APOLLO'S LED FIRST

Audiences arriving for Andrew Lloyd-Webber's new production of Bombay Dreams in London find themselves immersed in a unique visual experience even before they take their seats. The 72-year-old Apollo Theatre in Victoria boasts the world's first all-LED auditorium lighting system, taking the original architect's concept of simulating an undersea world into the 21st century with the latest in lighting technology, designed by Hoare Lee Lighting and NJO Technology and installed by Fagan Electrical and Stage Electrics.

When the time came to remove the elaborate Starlight Express set and prepare for the glitzy arrival of Bollywood, Apollo Victoria owners Clear Channel Entertainment commissioned London-based architects Jaques Muir & Partners to restore the interior of the huilding

Part of Muir's brief was to replace the original interior lighting, which consisted of 3,500 GLS lamps on two separate circuits. In conjunction with London-based Hoare Lee Lighting's Dominic Merritt and Orri Petursson and NJO

Technology of Cumbria, he came up with the idea of using specially designed clusters of LEDs.

The other three players in the story are the main electrical contractor, Fagan Electrical of Liverpool; Stage Electrics, whose team, headed by Nick Ewins, carried out the complex lighting and control installation whilst production rehearsals for Bombay Dreams were in full swing, and Terry Carnes, project manager for Clear Channel.

Orri Peterssun says: "We experimented with various light sources including cold cathode and xenon festoons, and finally LEDs. It was clear straight away that LEDs were perfect for this, because of the flexibility they would allow for colour changing, the high light output compared to cold cathode, and the fact that the wiring would be far simpler since each LED control unit is individually addressable. In all, some 88,000 LEDs are packed into 987 fixtures of two types, 'compact' and 'linear', manufactured by NJO.

NJO Technology has been working with LEDs for some eight years. The company developed the luminaire fittings and a control device to interface the LED units with four channels of DMX512 (red, green, blue and intensity). NJO's Annie Rawlinson comments: "We were on a fairly tight timescale – Starlight Express finished on January 12 and 987 units, plus 44 control units, had to be built and installed during March."

The compact extrusion fixture itself was Hoare Lee's design, and NJO developed the longer linear fixture to help achieve an even wash of light on the longer runs, particularly in the stalls. From then on it was a matter of working out the two module sizes to fit into the various nooks and crannies, and devising a polycarbonate diffuser to increase the dispersion angle.

Stage Electrics had already installed four new 72-way ETC Sensor dimmers early in 2001. On Starlight's departure, this was to be matched with an entirely new infrastructure including new socket boxes on both fly floors in the four corners of the stage and a large dim rail patch panel in the front-of-house organ loft, running to the front-of-house lighting positions. The company also installed a Stage Electrics stage management system incorporating a Howard Eaton Soft Cue system, along with a new sound and comms infrastructure.

And then there was the little matter of a lighting 'world first'. Stage Electrics' project manager, Nick Ewins, explains: "There was a requirement from English Heritage to light the auditorium in a similar way to the old system, but to achieve it using a new, unique lighting source and with modern-day health and safety standards. The quoted expected luminaire life is conservatively stated, simply because nobody has done









anything quite like this before. The estimate is 25,000 hours per LED at full output, after which there might be a drop in light output, but in terms of actual use they should easily last 25 years before we need to fit any replacements."

Fagan Electrical, the lead electrical contractor, has worked with Apollo Leisure Group (now part of Clear Channel Entertainment) since 1986, handling many large projects for the group including the rebuilt Lyceum Theatre. Rewiring the listed building, says Tom Fagan, entailed working in conjunction with English Heritage and the Theatres Trust to ensure the restored building matched the original as closely as possible. "We eventually succeeded in making it far better than the original," he comments. "With the LED fixtures we're running at five per cent of the original power loading, and they avoid all the hassles and safety problems of replacing lamps in terribly restricted roof voids and tiny spaces behind the architectural features."

In the listed building, cable routing was a primary concern, and Stage Electrics installed low smoke and fume cables, with all low voltage cables on cable trays, and discreet bracketry to position the LED luminaires precisely. A large DMX address system was devised with technical manager Dave Rose and Hoare Lee, and installed by Stage Electrics using proprietary buffer boxes, along with a new circle-front lighting position and cleaners'/emergency lighting.

The auditorium today presents a glorious spectacle. The hidden LED clusters, divided into 186 lighting 'zones' arranged around architectural features, allow unlimited pre-show states, while others can be visually linked to the stage production itself. In the case of Bombay Dreams, at selected points the grandMA Ultralite controlling the LEDs – supplied by AC Lighting – is cued from the Vari*Lite Virtuoso board which runs the stage show's lighting. In a fireworks scene, for example, the LEDs burst into vibrant action, taking the spectacle to the back of the stalls and balcony. For architectural effect, the domed ceiling might be lit in pale blue, with parts of the stalls in amber, others in maroon and the translucent alabaster 'stalagmite' features picked out in turquoise – or whatever takes an LD's fancy. Colours can be pale and muted, or vivid and intense.

Tom Fagan comments: "There was a certain amount of nervousness before the first units were installed, simply because it had never been done before. When we first switched them on, everyone in the theatre looked in amazement; they worked 10 times better than anybody thought they would in a dramatic and unique way. From our point of view it has been a very interesting and special project, working with the latest technology in a listed building." mirroring its shape. The majority of the moving lights are Vari*Lites, including 18 of the new VL1000 convection-cooled fixtures, featuring their tungsten source and programmable shutters. They're joined by 35 VL5s and 20 VL2Cs - all programmed by Andy Voller using a Virtuoso console. Vanstone is unequivocal in his praise of the VL1000s: "Finally the answer to my prayers! I had a chance to try them out on The Winter's Tale for the RSC at The Roundhouse, although I had already specified them for Bombay Dreams. They have proved enormously useful in both shows; the zoom is fantastic, the framing shuttering is easy to use, plus the frost works well and proves very useful. The entire rig, provided by Vari-Lite Europe, went in with few problems thanks to close liaison between production electrician Fraser Hall and Peter Marshall at Vari-Lite."

The conventionals list includes over 300 ETC Source Fours, plus a host of other generics. "By short-yoking the Source Fours I was able to save valuable space on the cross light ladders. In my opinion, the ETC Source Four is by far the best conventional theatre light," continued Vanstone. The rig also includes 20 six-lamp standard Digital Light Curtains and 8 six-lamp DLCs with pitching yokes, plus two double gobo rotators from DHA Lighting. Used in two groups, the pitching DLCs provide generalpurpose backlight for the show, with the remaining standard DLCs used to light the cyclorama. According to Vanstone, the Digital Light Curtain is especially effective when used in this way: "DLCs have been a favourite for years! They allow me to concentrate the heat of the light at the top, middle or bottom of the cyclorama, producing colour gradations from top to bottom, to create an increased variety of lighting effects. In a situation where space is key, this is a definite bonus."

They show also uses two of the new Le Maitre LSG carbon dioxide-chilled hazers, two MDG atmosphere haze generators, 31 Wybron 7.5" Coloram II colour scrollers (deployed on the cross-lighting), four Systems Imaging photoflash strobes, three Colour Arc 2kW Xenon followspots, and four Martin MAC 2000 Performance units, employed, projector-style, for set treatment.

Lighting the show's big dance sequences was challenging because it's a totally different type of dance, explains Vanstone. In true Bollywood fashion, there's a big 'wet sari' dance number - Shakalaka Baby - characteristic of older Hindi films - to circumvent the censorship!

Water plays a central role in the show, the recreation of monsoon rain and the water fountain for Shakalaka Baby being two of the more complex features. Any Effects was the company responsible for supplying and installing the water systems and, in the case of the monsoon rain effect, found themselves presented with a challenge they hadn't faced before - creating warm water so that the actors didn't suffer too much. This meant they had to gen up on health issues such as Legionnaire's disease, and include safety features to ensure it had no chance of developing.

Thus the rain is designed as a total loss system, whereby fresh water is taken in each time. The mains water in the roof is tapped into, re-chlorinated and then brought down to two large tanks in the organ loft. Here, it's heated to 60°C to kill off any marauding bugs, before being pumped through a thermostatic mixer valve and amalgamated with cold water to reduce it to 45° or 50°. However, by the time it's dropped 20 metres to the stage, the temperature is cooling rapidly. A water control system was custom-built to manage the effect and operates on a semi automatic basis. The 13 dancing water jets for Shakalaka Baby are supplied and fitted with all the pumping equipment in a system that works on re-circulated water, controlled by a pump and pneumatic air valves.

To handle the audio aspects of the production, sound consultant Nigel Wright,







The scale of Bombay Dreams is impressive considering the lack of space the team had to work with. Below left, sound designer Mick Potter. Next to him, set designer Mark Thompson (left) with LD Hugh Vanstone

who produces Andrew Lloyd-Webber's albums, recommended sound designer Mick Potter who joined the team in December 2001. He observes that, unusually, he received a very precise brief from A R Rahman, who is best known for his screen writing. The feeling Rahman wanted to evoke was that of a book musical, with a cinematic feel and an architectural edge lots of large pads and string sounds.

Potter comments that Mark Thompson was extremely accommodating in terms of building the speakers into the set. He needed to be - as the six-a-side Meyer M3D line array cabinets are a serious size! However, they are carefully disguised from the audience in giant, ornate pillar-like enclosures, perforated with thousands of small holes, blending seamlessly into the set.

Bombay is a first for the Meyer M3D in a theatrical production. Potter chose the system because the show needed plenty of dynamics and lots of low-end level. The cardioid design of the M3D made it the only speaker with sufficient low frequency control to fit the brief. He also admits to the decision being partly based on his fondness for Meyer. The under-hang speakers below the M3Ds are Meyer CQ2s, and UPA 2Ps are used for the centre cluster. A further eight CQ2s rigged on a FOH truss

are utilized as balcony delays. For upstairs and downstairs delays there are 53 d&b audiotechnik E3s whilst 48 of the tiny new d&b E0s ('E zero') are used for the surround sound in conjunction with E12 subs.

All audio equipment was supplied by Orbital Sound, who have plenty of world-class West End productions under their belt. The company also has a reputation for pushing the digital sound control and processing envelope, so when Potter chose a Yamaha PM1D as FOH console, he knew he was in good hands. It was the first time he'd used the desk - picked for the demands of the show which needed a



flexible desk with loads of programmability. He has been impressed by the recall facilities, EQ level and the scene-by-scene effects processing.

Apart from that, the console's expedient size and relatively light weight enabled the audio department to join lighting down in the central stalls during the initial stages of the production period. This gave Potter the advantage of being close to the stage action and directly next to the director and other members of the creative team. With large analogue consoles this has never been a practical option.

The only external processing comes from two TC M3000s and four Avalon analogue EQs;

the remaining EQ and delays are all achieved within the PM1D. Potter is using all 96 of the desk's inputs with many configured as direct AES digital pairs, thus keeping the signal from keyboards, samplers, the M3000s and Mackie hard disc recorders entirely in the digital domain. A Yamaha 03D is located in the pit for a 10 into 4 sub-mix of all keyboards and e-drums per side.

The band is secreted in an understage pit. The foldback system is run using two small Crest XRM monitor mixers bussed together,

and each musician has his/her own custombuilt 0T2 24 input mixer, a 1U unit system combining stereo and mono inputs specially designed for orchestras. Potter worked closely with musical supervisor Chris Nightingale to ensure the band had the requisite technology - far more than would normally be found on a conventional musical - and make it work for them. Potter opted for the miniature Sennheiser 5012 radio transmitters for the cast of 40: "They're tiny, reliable and sound great," he says. These have to contend with some water abuse during the monsoon and the enthusiastic frolickings of Shakalaka Baby below the impressive fountain. The mics used are DPA 4061s, apart from in the wet scenes. where the principals wear Countryman B3s for their additional water resistance, augmented with the skilful application of clingfilm technology.

The show's dynamics have proved an interesting area for audio - encompassing performance mediums ranging from big cinematic Bollywood numbers to a traditional musical. The theatre's auditorium and plentiful reflective surfaces gave Meyer's technology a good run for its money in attempting to keep the images off the walls and ceilings. Potter and his team used Meyer's MAPP (Multipurpose Acoustical Prediction) software programme to ascertain precise speaker interaction. On this system simulation aspect, Potter worked with Luke Jenks and Dave Dennison from Meyer.

For sound effects, the show uses G-Type software, running two Akai S6000s and two Mackie HDR24 hard disk recorders. The comms system is an extensive RTS arrangement, again supplied and commissioned by Orbital Sound. Working alongside Potter is production sound engineer Greg Clarke, associate designer Tim Clark, and operator Nick Sagar.

Bombay Dreams has been generally well received by the critics, so much so that it has recently extended its run to March 2003.

Photos: Louise Stickland

