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The logo for Light & Sound International (ISI) is displayed in a large, semi-transparent white circle. The letters 'ISI' are in a bold, sans-serif font, with a small pink square above the 'I'.

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Bat out of hell



Julie Harper reports from the Dominion Theatre on Jim Steinman's musical juggernaut based on the well-known Meat Loaf album . . .

Performance photography: Kirsty Taylor

Originally envisaged as a rock musical, Jim Steinman's *Bat Out of Hell* first came to fame with Meat Loaf's titular triple album in 1977 (yes, really!) which was to become one of the best-selling albums of all time.

40 years later, the show finally found the right producers in David Sonenberg, Michael Cohl, Randy Lennox and Tony Smith, and a team of musical theatre's top creatives, who developed the show's storyline over successive rehearsals before it opened for a limited run at Manchester Opera House in March 2017. Finishing touches were added during subsequent runs at the London Coliseum and Toronto's Ed Mirvish Theatre before *Bat Out of Hell The Musical* came to roost in its permanent West End home at the Dominion Theatre.

The result is a musical that is operatic in scale, theatrical in storyline and most definitely rock and roll in sound. It earned the London Evening Standard Theatre Award for Best Musical in 2017, the What's On Stage Award for Best Lighting Design for Patrick Woodroffe in 2018 (having received nominations in eight categories), plus a much-coveted Olivier Award nomination for sound designer Gareth Owen.

Set in the post-apocalyptic city of Obsidian, the story has echoes of *Romeo and Juliet* meets *Peter Pan*, when Raven, daughter of Obsidian's despotic ruler Falco, and Strat, leader of an abandoned gang of youths (strangely frozen at the age of 18!) The Lost, are irresistibly drawn to each other. The barrier between the gilded embellishments of Falco Tower and the toxic waste and urban grime of The Lost's home in The Deep beneath Obsidian, begins to falter and the ensuing battles between the factions are played out in a fast-paced celebration of huge voices, dazzling visuals and humour on an ambitious set full of gags.

Despite being set in 2030, the aesthetic is unashamedly '70s, with the costumes, co-designed by Jon Bausor and Meentje Nielsen, retaining the silhouettes and fashion trends from when the album was at its prime. "This adds to the nostalgia and ensures its appeal to audiences of all types and ages: the older ones who know the music, and the younger who come for the spectacle but fall in love with the music through the show," says associate set designer Rebecca Brower, adding: "Everyone wants to be Strat, be free and live forever!"





SET: ROCK AND ROLL DREAMS COME TRUE . . .

Jon Bausor's huge set design, full of stretched perspectives, reaches expansively out into the auditorium ("... with not a single regular angle in it," as production manager Simon Marlow notes). The lava flow of the Obsidian Mound spills from the wings, pierced by a tunnel, with a ruined Billboard and a haphazard mesh of girders overhead; The Deep is identified by a large 1.6t Drainpipe flat with some beautiful projection lending it three-dimensional depth, while the 15m high glass and steel fortress of Falco Tower dominates stage left and stretches up into the grid, backed by a massive sky cloth; a framework of destroyed buildings reaches out into the auditorium above the audience, even leaning on the edge of the FOH boxes.

"Jon's aim was to make the audience feel they were enveloped in this world with the characters," explains Brower. "He wanted the set to reach every possible wall of the theatre, so wherever you sit in the audience, you feel the impact of the grandeur of the ruined city which appears to continue forever."

Bausor worked closely with the other departments to incorporate the many elements within the set that include cameras, pyro, CO2 jets and nearly 2km of LED strip lighting. "We have a lot of lighting integrated into the set," says Brower. "I love the LED strips that run up Falco Tower which flicker across the building as Strat strums his guitar at the top of the show. It's like the building emulates the face of the guitar as little elements of each other's worlds leak into one another. It's also been fun to use projection in new ways,

for example, using the beams and colour from projections themselves as animated mid-air effects.

The main stage floor is a marbled light box, echoed by a smaller version in the bedroom in the upper levels of Falco Tower, beneath which automated sliders part to reveal a neon-lit bar. The Tower itself and the Billboard are covered with projection scrim and double as two large projection surfaces.

"There are lots of hidden tricks in the set. We don't show everything all at once: the Billboard, for example, is not revealed until act two and the sliders beneath Falco Towers reveal what they hide only in stages. It's a way of keeping the massive, static set interesting throughout the 2.5 hours of the show. I'm not going to reveal them all here of course, but one trick is kept to within the last 30 seconds of the show just to add another layer of 'wow' factor!"

AUTOMATION: ALL REVVED UP WITH NO PLACE TO GO . . .

The set is indeed massive, with Unusual Rigging using 105 chain hoists to load it in, along with 7.5t of lighting and sound equipment in the front of house rig alone.

Within the set there are 35 moving pieces and different axes of play which use the full range of the automation spectrum: aside from a Cadillac, two slewing motor bikes, kabuki drops and sliders, there's a power-flow Drainpipe flat weighing 1.6t with two side flats that open out on a timer, a stage-depth Bedroom Wall with an additional header that is raised as it slides into position, and the usual selection of

↑ L-R from top: Sound: Mike Ryles, Gareth Owen, Matt Peploe, Laura Caplin, Andy Green, Danny Pearson

Video: Chris Bartlett, James Craxton, Jonathon Lyle, Rob Allen, Claire Buxton, Emily Malone

Lighting: Rob Casey, Richard Mence and Tom Turner

Facing page: Simon Marlow (production manager), Danny Garth (automation) and Rebecca Brower (associate set designer)

counterweight flying pieces that include a chandelier and a 3D cage with hanging corpses overhead . . .

Up in the belfry of the fly floor and responsible for keeping the heavy stuff moving where and when it should is head of automation, Danny Garth. "We are the choreographer's best friend," he says. "We devise which is the best way to move each piece according to look, weight and function - which is a collaborative process between creatives, designers and engineers - and ensure each piece moves at exactly the same speed, and is placed to within a millimetre every time at the press of a button. Our encoders provide a consistency and accuracy which is much safer, more consistent and more reliable than a human being.

"The information from our encoders enables us to programme those precise combinations of coordinated movement between pieces, and is fed to all other departments - lighting, video, sound and stage management - who often take their cues from the automation data, so the video department can track their projection with the movement of each piece, and all moving pieces are strictly coordinated with everything else that is going on."

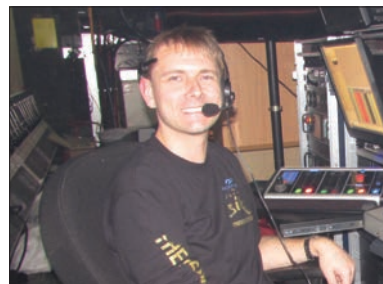
The show's multi-axis requirements are controlled via a Silicon Theatre Scenery's own STS Autostage 2000 Composer which runs the majority of automation, plus a PE2 desk from Flying by Foy for one of the show's surprise central effects, which uses Pegasus software and an Aerographer design package. "All very user friendly," says Garth.

It is not all high-tech, however: "My biggest concern in the show is the Falco Tower sliders. The guide wheel in the track can be stopped by something as small as a screw or bolt in the groove. To mitigate this, we have attached paintbrushes to the bottom edge of each slider to sweep the groove clear with each move!"

He adds: "We're here to keep everyone safe. We are not the glamorous ones, although some very spectacular things can be done with automation. There is no busking during a show for us, and we certainly don't want to be creative at this stage. Show operation is easy in terms of the amount of work required, it's the maintenance and set up that are far more technical and labour-intensive."

LIGHTING: PARADISE BY THE DASHBOARD LIGHT . . .

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the first-time collaboration between LD Patrick Woodroffe and associate LD Rob Casey. Woodroffe's experience in touring live bands was complemented by Casey's expertise with the discipline and level of accuracy demanded by theatre lighting, and they were soon to discover that the different styles made for very different approaches.

"Patrick works in broad strokes and his idea was to produce a design that was Wagnerian in look, and that lights the set as much as the cast," says Casey. "He would then give us the first cue for each scene and leave us to fill in the gaps before giving us feedback. But it was interesting for Chris [Hirst, programmer] and I to quickly develop a new language that enabled us to work at pace and create something from nothing."

Under those conditions it is very important to have a familiar, solid team in support, so Casey brought in Chris Hirst, "probably the best theatrical MA2 programmer in the country", and Richard Mence, "a good friend and very good, flexible production electrician." He also has a close working relationship with video designers Finn Ross and Adam Young of FRAY Studios, video systems engineer Jon Lyle and programmer Emily Malone, all of whom know each other from past shows and operate in the same 'language'.

"We took Patrick's remit and developed an idea that was flexible with lots of 'looks', ideas and variables that could be developed or removed as the show began to take shape," he says. "A lot remained undecided until everyone met in the theatre in Manchester, and with three

different contractors working on the set it was always going to be tricky working from three sets of instructions. Luckily, Richard and his team are very adaptable and willing to change things on site, and we now have a bullet-proof set up for the permanent installation."

Casey describes the set as 'a gift to light' because of its multiple layers and the shadows that can be created through it. Unusually, the rig is trimmed very high with three overhead electrics positions rigged at 15m above the main playing area. "This is partly because of the scale of the set and partly to obscure the technology from view, but it allows us to make lots of visually impressive backlight looks through the industrialised scenery and scenic girders overhead," he says. Martin Viper Performance and GLP impression X4 L washlights are instrumental in this, forming 95% of the overhead rig.

Casey continues: "We mainly use back and top light for each scene, with just four Lycian M2 followspots to provide the main front light for the main characters and duets throughout. There are no FOH positions at the Dominion, and the upper circle is very far away and flat, plus the two main lighting surfaces - the Tower front and the Billboard - are also projection screens, so there aren't many places to 'lose' light. There's also a comprehensive cross light system in the proscenium provided by Source Four Lustr 2 units which give full stage cover

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for big ensemble numbers, and various show-custom positions at the back of the tunnel and elsewhere, which developed during the creation of the show." Philips Color Kinetics Colorblaze TRX units are used to light the cyclorama which is backed by a bounce cloth.

The main stage lightbox floor, fabricated by Andy Hardy Engineering, is made up of 80 individual panels each lit with approximately 10m of LED tape installed, appropriately enough, by HELL (Howard Eaton Lighting Limited). LED strip also outlines the Billboard mirror box and the front of Falco Tower, both constructed by TR2. The bar beneath Falco Tower is festooned with neon signs, industrial bulkhead lights and more LED tape. Additional scenic elements including traffic lights, embedded monitors, and Walk/Don't Walk signs add edgy character and realism to the set.

"We have a huge amount of set electrics and practicals, 334 separate channels in total," says Casey, "90% of which are supplied by Howard Eaton Lighting, and the remaining 10% by Lamp & Pencil." Casey likes to add these at an early stage as a starting point for each state: "Almost every scene has a tag, like the Cadillac's headlights, brake lights and the all-important dashboard lights! It gives you something to hang that scene's thread on."

The Obsidian Mound, built by Souvenir Scenic Studios from translucent fibreglass, conceals Chroma-Q Color Punch 6 fixtures inside the rocks which light some carved translucent sections from within, enhanced by video projection on the outside. "It's almost impossible to tell which is which," says Casey.

Additional atmospheric effects include three Look Solutions Viper smoke machines in the stage and pit, two MDG Atmosphere APS haze generators in the tunnel and fly floor, and three Look Solutions Cryo-Fog low-fog machines in the deck feeding up through DMX-operated low-fog pop ups in the floor fabricated by HELL. HELL also devised a customised cone of smoke that shoots from the tunnel, a second custom smoke curtain under the Billboard, and multiple CO2 and flame jets.

Four Atomic strobes and 23 High End Dataflashes are embedded in the set and rigged in the auditorium where they are used as audience blinders in the more dramatic reveal sequences and help bring the audience closer to the action. "We increased the quantity and added them to the circle delay bar at the Dominion to ensure those in the back of the stalls experience the same impact as those closer to the stage," says Casey.

Two grandMA2 light consoles (one acting as back-up) provide show control, with an MA2 and three NPUs running 1,100 lighting and video cues (a mix of called, MIDI and timecode) across 16 universes of DMX.

"The division between lighting and video on the show is approximately 50/50, so Finn and I worked closely to get the balance right between lighting for a camera feed or the human eye during the live camera sessions," explains Casey, "occasionally compromising by iris-ing down on the camera so we could raise the light levels for the audience."

VIDEO: OBJECTS IN THE REAR VIEW MIRROR MAY APPEAR CLOSER THAN THEY ARE . . .

"I wouldn't want to work with a team that didn't have that close relationship," states video systems engineer, Jon Lyle. "Lighting and video are intrinsic to one another and a close collaboration is the only way to make an integrated design that really works." As proof of this, all Finn Ross' Tony and Olivier Awards are co-credited with other departments as bringing together all aspects within each show.

Ross's design incorporates a lot of live camera work to enhance the live experience for the audience. An on-stage camera operator using a Sony PXW-X200 handheld camera with Boxx Atom wireless solution, follows the performers closely around the stage; the feed is projected upon the large projection surfaces of Falco Tower, the Billboard and the bedroom walls, adding a sense of immediacy and of private life lived publicly. Three remote Sony BRC-Z330 cameras with pan/tilt/zoom capability are built into the set and focus on areas of the stage to capture different images from out front. "There's hardly any

surface that we don't project on, and there's even a set of monitors downstage which 'dress' the set and act as relay for those with limited sightlines so they can still see what's on the Billboard," says Lyle.

"The whole system is networked, with main and back-up computers and cameras, and a Ross Ultrix Matrix allows us to switch between them as needed. Because the cameras are so critical to the narrative throughout, the back-up cameras are running continuously so we can change to them instantly should anything go wrong."

The cameras feed into three disguise 4x4pro media servers (a master, slave and understudy) from where programmer, Emily Malone, manipulates the camera feed with Notch software to generate live effects like grading or chromatic separation of the imagery to give a blurry, dream-like quality. Additional video content is provided by FRAY Studios' animators, Adam Young and Ash Woodward, and all video cues are triggered by the main grandMA2 console.

There are five FOH projectors: four Panasonic PT-RZ31k 30K laser projectors, two that cover the fascia of Falco Tower and one each covering the Billboard and Drainpipe Flat/Obsidian Mound. A Panasonic PT-DZ21k 20K projector covers

the show cloth at preset, with a second at the back of the tunnel creating shapes, colours and movement through the smoke. "It adds another level of movement to embellish the lighting effects," says Lyle. In addition, four Samsung UD55E monitors fill a shop window upstage selling 'XXX videos'.

Lyle chose the Panasonic laser-source projectors because their bright, crisp output gave that vital rock and roll quality. "We've always used Panasonic projectors because of their superb light quality, image quality and colouring, and because of the great support we receive from Panasonic. So, when the 30K laser projector was released just before we started at Manchester, it was the obvious choice, and ours were amongst the first units to be used in the UK," says Lyle. "For the amount of light they generate, the PT-RZ31k is comparatively quiet and incredibly small. That said, we still needed to reinforce the support for the four units FOH which, between them, weighed around 1000kg! This also gave us the chance to integrate them structurally to reduce the visual intrusion for the audience. The major advantage of the laser technology, however, was the ability to turn the projectors off and on during the show. This meant we only turned them on when we needed to use them, which considerably mitigated noise levels in the quieter sections."

"It is a big show to build and install and all departments are pushed to the limits, with lighting, sound, rigging, automation and pyro all fully stretched ..."

Simon Marlow

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The Panasonic PT-RZ31k 30K laser projectors, like all the show's lighting and video equipment, is supplied by PRG XL Video.

SOUND: YOU TOOK THE WORDS RIGHT OUT OF MY MOUTH . . .

So how do you succeed in making musical theatre sound like a rock and roll show? The task fell to Gareth Owen of Gareth Owen Sound (GOS). "Our goal was to deliver accurate surround sound to the entire audience - which is traditionally very difficult to achieve in theatre," explains Owen. "Our immediate challenges were the acoustics of the Dominion, and living up to the legacy of the outgoing Queen musical, *We Will Rock You*, which was a truly dazzling-sounding show - that put us under pressure from the start! Luckily, we had the full support of the producers who were willing to give us all we needed to deliver the sound they wanted - but then we had to deliver on our promises!"

Owen chose an Avid S6L mixing desk, Allen & Heath DM64 and ME-1 monitoring system, and the biggest d&b system ever used in West End theatre, all of which was supplied by Orbital Sound. "I went with the tools I've had success with in the past - I'm a long-term user of

d&b and Avid and I have a workflow and a methodology with this kit that gets results I know people will be happy with."

It's a formula which seems to work for Owen and his team who currently have four new musicals running in the West End and three on Broadway, and is the first sound design team to have shows in the 'holy trinity' of London's three largest theatres: the Dominion, Theatre Royal Drury Lane and the London Palladium. "It's a tribute to the combination of technology and the fantastic team at GOS, without whom I couldn't begin to do what I do as a sound designer. We have some of the best guys and girls in the business working for us," says Owen.

"Avid is also the manufacturer of the industry-standard Pro Tools mixing system," he continues. "The S6L offers a live version of that which instantly gives us access to all the same plug-ins and presets that our music team have in the studio. For *Bat Out of Hell* we use McDSP, Sonnox, Brainworx, Empirical, Flux and Waves plug-ins. It also has integrated virtual soundcheck which allows us to quickly identify and fix problems. No other desk has this level of plug-in support. It's a really powerful tool for us and means we were all singing from the same song-sheet."

The main PA system is made up of d&b J Series speakers, a centre cluster of d&b V8s, d&b V Series subwoofers with B22s and J-INFRA, and a lot of E8, E6 and E5 boxes for the surround sound delays and infills. To achieve the accurate surround sound required, Owen departed from the traditional arrangement of delay speakers, opting instead for triple clusters facing forward, left and right. "With dozens of speakers in the auditorium, this provided an immersive surround sound to every seat in the house," he says.

Fitting the enormous sound system into the large and complicated set was always going to be a challenge. "We have huge line arrays on either side of the proscenium and few places in the stage where we can put stage foldback speakers," says Owen. "Jon Bausor was very helpful in creating niches for us to fit speakers into his epic set, and we have around 35 speakers embedded all over it to cover the many performing areas at different heights. Emily Egleton at Unusual Rigging also pulled off miracles with a rigging plot that could handle the weight of the speakers, lighting and scenic elements in the grids of theatres that were not designed to take that weight."



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The cast radio microphones are Sennheiser SK5212 transmitters with 3732 receivers. Some cast members use Sennheiser G3 in-ear monitors (chosen for the smaller pack size) at some points in the show, and the four-piece band that occasionally appears on stage use fully wireless systems, including Shure PSM1000 in-ear monitors.

The orchestra, which is squeezed into the pit around some hefty scenic engineering and a large water tank, use a combination of Audix microphones for the drum kit, DPA for the brass and reed section, Radial DI boxes for the guitars and bass, and a mix of Sennheiser, Shure and DPA for percussion. An Allen & Heath DM64 monitor desk with individual ME-1 mixers give the musicians a nicely versatile monitoring solution that allows them to quickly personalise what they hear.

"The show control element is very important as every song runs to click track, and we distribute timecode and MIDI signals to all other departments to sync lighting and video effects," says Owen. "Our associate design team spent a lot of time in pre-production working with music on the timecode and rehearsal tracks allowing other departments to program offline before we even got to the theatre. Timecode locks the show together tighter,

but adds hugely to our workload - it's a big responsibility."

The man holding all the departments together, calm, unflappable, and definitely not given to hanging upside down by his feet from the grid, is production manager Simon Marlow. "*Bat Out of Hell* is one of the most challenging and rewarding shows I have worked on," he says. "It is a big show to build and install and all departments are pushed to the limits, with lighting, sound, rigging, automation and pyro all fully stretched. It has gathered a group of very talented people to put it together and operate it.

"There is a great feeling backstage: everyone is happy they have so much technology to play with, and it's very rewarding for the show crew because they are constantly busy. The audience have a great time and it's good to see them enjoying the technology and the spectacle. There are some fantastic moments, like the realisation of the *Bat Out of Hell* number; when all departments come together everything crystallises into a great moment.

He concludes: "Our producers don't do things by half - they know what a spectacle should be. Having said that, I am relieved it has found its permanent home." ✕

"There's hardly any surface that we don't project on, and there's even a set of monitors downstage which 'dress' the set and act as relay for those with limited sightlines..."

Jonathon Lyle

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