

When the PMF approached me to write a piece about “The Prince of Egypt”, I reflected for a day or two on how best to frame the article. What would be interesting for fellow Production Managers to read? In the intervening days, John Young, who I bought on board as Health and Safety Consultant for the production, published a superb article in Sightline magazine, which I am sure many of you will have read. If you haven’t already read John’s article, it can be found [here](#).



The piece goes into much technical detail about the engineering, automation and special effects. Some of the specifics were enlightening even to me! So rather than risk repeating, or worse plagiarising, his brilliant article, I concluded that I should focus more on the process, from model box to opening night, rather than on the particular model of Serapid Chain or the exact PSI of the nitrogen system.

I have tried to avoid my article reading like a list of names, but I think we must all remember that a Production Manager is only as good as the team around them, and it would be remiss of me not to mention some key people. No man, or woman, is an island.

Early Days

Unusually, I was initially approached about the production by a fellow Production Manager, Simon Marlow. Simon had been slated to PM the show, but as is so often the case in our world, dates shifted, and he now had a direct clash with the opening of “Back to the Future”. By happy coincidence I had just worked with the Producer, Neil Laidlaw, on “Captain Corelli’s Mandolin”. After a couple of transatlantic video calls with Scott Schwartz (Director), Kevin Depinet (Designer) and Dreamworks Exec’s, I found myself firmly in the frame and on a plane to Copenhagen to see a version of the show currently being staged there.

The West End design had “flavours” of the Copenhagen production, but it was clear from the outset that very little of the Copenhagen physical assets would be of use.

The show in Copenhagen closed in June, but due to factors out of our control, we found ourselves rapidly approaching the autumn by the time we were in a position to really progress with a meaningful costing, with an early January load in looming. As to be expected, the initial design was over budget, but, perhaps more pertinently, unachievable in terms of the load in and technical rehearsal time. With previews already on sale, and “White Christmas” (the previous show in the venue) not closing until 4th January, we found ourselves hemmed in from front and rear. The red scissor action would need to be both extensive and rapid.

Safety First

On engaging with the design proposals, three major elements immediately presented themselves as being potential stumbling blocks from a safety – and therefore licencing – point of view.

1. The Earth Piece, a large automated piece, with both a tipping axis and a lateral movement axis, crossing the iron line.
2. A complete “ring of fire” around the perimeter of the Earth Piece, so by definition, also downstage of the iron.
3. The lateral movement of the Earth Piece (later to become known as the Tongue) travelling into the front row of the stalls, in close proximity to the audience.

An early meeting was convened at the venue (The Dominion Theatre) with officers from Camden Council and Dave Doyle from London Fire Brigade. Supported by John Young, I presented our propositions, and proposed mitigations. I think our early engagement with the authorities demonstrated our diligence, and consent in principle was given. This was hugely reassuring, as clearly an objection to any of those three items is not something to discover at the usual pre-opening licencing visit!



EARTH PIECE IN FULLY TILTED POSITION
(PHOTO CREDIT: JOHN YOUNG)



RING OF FIRE, CROSSING THE IRON LINE, ALSO SHOWING THE CENTRE LIFT
(PHOTO CREDIT: JOHN YOUNG)



TONGUE PIECE, FULLY EXTENDED OVER THE ORCHESTRA PIT AND INTO THE STALLS
(PHOTO CREDIT: JOHN YOUNG)

Scenic

It became clear very soon after being brought onboard, that a full competitive tender process was going to be impossible, due to the extreme time pressure. With this in mind, calling upon on existing working relationships, and with the blessing of the producers, I booked a substantial “slot” with **Cardiff Theatrical Services** (CTS) and **Set-Up (Scenery) Ltd**. I was compelled to make some unilateral decisions about how to allocate the various elements, based on my opinion of each shop’s strengths. Having both shops quote on all items and then “cherry picking” would have required time that we did not have. I was very upfront about this with the shops, and the producers. Both shops were superb at working with me through the various stages of cuts and re-imagining.

CTS took ownership of:

- the Earth Piece (alongside an as yet un-contracted engineering shop, more on that later),
- the floor,
- the subfloor including extensive backfilling of the removed area of venue modular stage,
- the forestage / orchestra pit arrangement,
- and the Sky Piece.

Set-Up took ownership of:

- the string curtains (which are extensive, both onstage and front of house, forming a vast surface for front projection),
- the custom tracking associated with the string curtains,
- and the legs and headers.

CTS’s brief was relatively standard, albeit with some complex elements. Set Up’s brief on the other hand was very unusual in the sense that the amount of traditional scenery they had to build was very minimal. Essentially Matt Bigg and Chris Petrinovic took on a project management role, handling the realisation of all the string curtain elements. The string curtain itself came from **Showtex**, but required extensive paint treatment and cutting to custom shapes; all done on Set Up’s paintframe. Custom track came from **Triple E**, and the automation from **Absolute Motion Control**. Despite several late design modifications, they handled the project superbly.

Unlit, unloved and coming out of their bags in a tangled mess, the string curtains is slightly underwhelming, but with Jon’s video alongside Mike’s lighting, and lot of combing with a customised garden rake, they ended up looking pretty spectacular.

MDM Props took on some of the scenic / prop crossover items, including the copious polycarved blocks and bricks that form a key ingredient of the design and the choreography. With much “back and forth” between rehearsals, their London location was a huge benefit, as was Stephen Medcalf’s unparalleled carving skill.

With the scenery having made it to the dock doors, Nat Lunn (my long time right hand man) led the team of carpenters onsite, backed up by (amongst others) Craig Emerson and Tom Humphrey, with Gilles Pink from **First Call Crew** as Loadmaster, managing the trucks and the dock.



STRING CURTAINS WITH LIGHTING AND PROJECTION VIEWED FROM THE CIRCLE
(PHOTO CREDIT: VICKY LORD)

Engineering

In the initial design proposal, in addition to the pieces that were eventually realised, there was a series of lifts around the perimeter of the Earth Piece, and the Sky Piece flew into the deck with the rear becoming a walkable, “actable” and “danceable” surface. Even with the Dominion’s brand-new modular floor and generous load in route, it soon became clear that the lifts were insurmountable both financially and in terms of load in / tech time. Paul Craven of **Adder Engineering** was an invaluable resource from day one, engaging with the process generously and without hesitation. By Paul’s own admission his fabrication capacity is modest, and therefore due to the lack of lead time, he was unable to take on the fabrication of the major elements, but this did not lessen his willingness to offer advice and counsel. And he made a lovely drop and slide!

After conversations with a range of engineering shops, **Brilliant Stages** stepped into the breach. With Toby Van-Hay crunching the numbers, James Kempf crunching the kn’s and kg’s, and the creatives crunching the inevitable compromises, by October we arrived at a scheme that satisfied all. I hadn’t worked with Brilliant previously, and I will confess I did have a slight nervousness about the converging of two seemingly similar but tangibly different worlds. Brilliant have a wealth of experience creating and touring pieces of engineering that make even the biggest theatre tours look like a primary school nativity (Take That’s 40,000kg LED sphere to name but one), but could this be successfully translated into the more delicate theatre world, where a different level of integration is required? The answer, thankfully, is yes. Lucas Wilkinson, Martin Radmall and numerous talented designers completed Brilliant’s team, with the whole team readily integrating with CTS on the scenic of the Earth Piece, **Unusual Rigging** on the install methodology, and Mike Jackson on the structural limitations of the venue. Brilliant’s massive bandwidth, both in terms of fabrication, but also more critically, design, meant that the pieces could be realised in an extremely condensed time window, with the further complication of Christmas just prior to load in.

After automation testing by Absolute in Brilliant's hangar, the skeletal piece was stripped down and sent to CTS where the team led by Abi Emmett and Leejay Burnell, with the backup of Olly Shapley in the drawing office, were poised to pre-fit the cladding and facilitate the install of the fire trough and various other tricks. They worked tirelessly over the festive period to ensure we could hit the deadline of the load in date.



EARTH PIECE SHOWN AT FULL TILT, LOOKING FROM SL WING
(PHOTO CREDIT: JOHN YOUNG)



UNDERSIDE OF EARTH PIECE
(PHOTO CREDIT: JOHN YOUNG)

Automation

Much like Paul Craven of Adder Engineering on the engineering front, Absolute Motion Control and in particular at this stage Ben Phillips, were attached to the project from very early on, working with me on the various design iterations. Absolute have supplied automation on a number of my plays, and I quickly came to admire their collaborative spirit and flexibility as much as the high end, beautifully designed equipment and control which they supply. I was extremely keen to have them by my side on this large musical.

Ben, alongside Rob Raskovsky (who also programmed the show), were instrumental in ensuring extensive testing of all the key pieces happened offsite prior to the load in. This proved to be totally invaluable, and without their diligence on this front, we would have found ourselves in grave difficulties onsite during the load in.

Onsite, Ben and Rob supported the show team headed up by Aimee Tither throughout a complex technical rehearsal process. The Earth Piece was a particularly complex piece in terms of ensuring we did not exceed its designed parameters once working with the cast. As to be expected there were a number of limiting factors in terms of the load capacity. The allowable load varies depending on the exact placement of people and scenery, and also the tilt angle of the piece. To enable us to be scientific and robust in our approach to this, load cells were incorporated into the Serapid drives, meaning Rob could monitor real time data as the tilt and cast placement changed throughout scenes. This enabled us to know, categorically, that we were within the allowable limits, removing the need for any “estimating” and therefore alleviating any worries.

Venue

The venue staff, led by Dave Sutherland and Stuart Plume, were engaged and pro-active throughout. The venue was the proud new owner of a new modular floor, designed by Mike Jackson and realised by Unusual Rigging. We needed to remove and backfill a large area of this floor to accommodate the earth piece and lift. Without this new floor, and in particular its time efficient design, many days would have been added to our load in; time which we did not have. We were also blessed with ample roof capacity front of house, which was of particular importance due to the extensive front of house environment.

That said, the extremities of the FOH trussing extended wider than any previous installs at the Dominion, meaning two additional rigging points, and therefore holes in the plaster ceiling were required. The venue worked willingly with Mike Jackson, Unusual and **Hayles & Howe** (fibrous plaster ceiling experts) to enable these works to take place.

Rigging

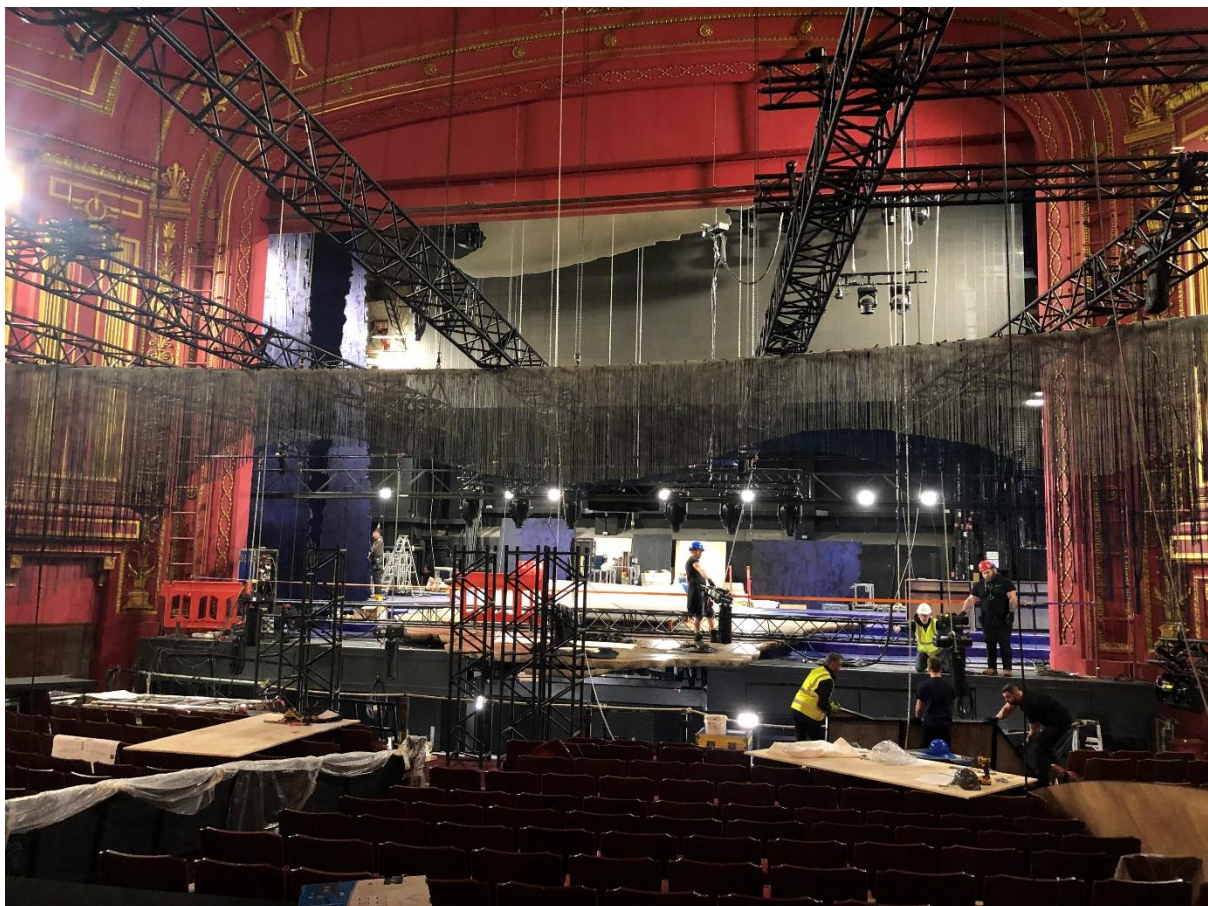
With Unusual Rigging’s knowledge of the Dominion, coupled with my working relationship with them, they were the obvious rigging contractor for the job. There were challenges with the overstage rigging, but it was with regards to the front of house environment that Unusual really earned their glass of warm press night wine. Simon Stone (Director of Theatre) and Emily Eggleton (Design Engineer) took the lead on the project initially, with Harrison Snelling (Production Rigger) joining a little later in the process.

Emily had the unenviable task of co-ordinating the requirements of scenic, lighting, sound and video, all requiring extensive amounts of space and kit, and all whilst trying to avert the prospect of the entire auditorium looking like the roof of the Excel Centre. The brief was the Red Sea, not a Sea of Truss. After several transatlantic screenshare sessions, countless conversions from metric to imperial and Vectorworks to AutoCAD, Emily piloted us to something that worked for all. There were, inevitably, some tweaks and changes onsite, but it certainly got us to a great starting point.

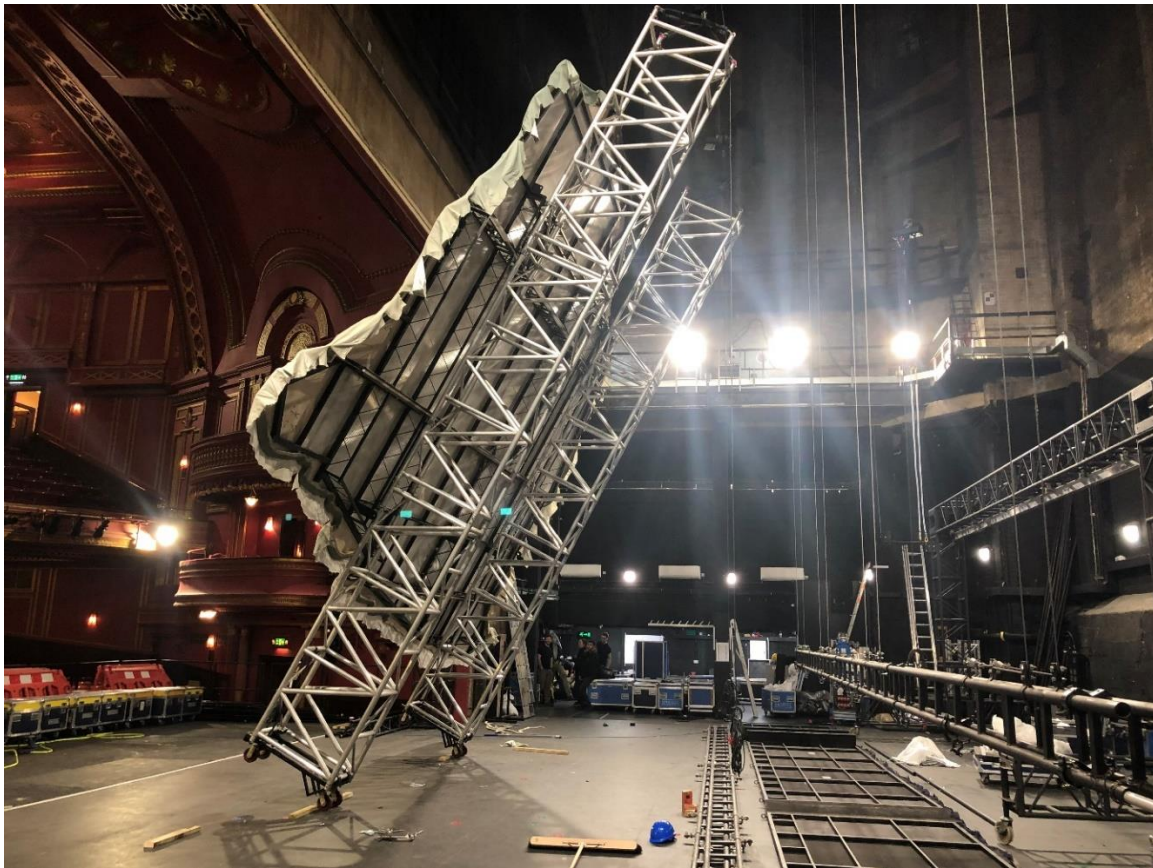
Prior to the load in, Simon Stone took a backseat, and handed the baton to Harrison Snelling who would be our Lead Rigger throughout. Harrison did an incredible job running his team. With continuing changes throughout technical rehearsals, and even into previews, Harrison found himself having to work around others at a point when the riggers are normally long gone, but never a grumble was heard.

Onstage, due to the Sky Piece taking up a large amount of real estate centre stage, and automated tracks running upstage to downstage for the Red Sea string curtains, virtually every flybar had to be split and diverted, or else replaced with custom truss and motors. So this also provided ample head-scratching opportunities for Emily, Harrison and me.

The Sky Piece Kinesys system was supplied by Unusual. Initially this was slated to be an LED surface, but ended up being a front projection surface. The piece needed to be covered seamlessly, which due to the size of the piece had to be done onstage. Working with Unusual and CTS, we devised a methodology of build trusses and custom dollies, to allow the piece to be covered face up at stage level, flipped over on build motors and then being transferred onto Kinesys motors at height.



A SMALL PORTION OF THE FOH TRUSSES AND STRING CURTAIN, EARLY IN THE LOAD IN
(PHOTO CREDIT: JOHN YOUNG)



SKY PIECE, SEEN FROM THE REAR, MID WAY THROUGH GOING UP ON BUILD TRUSSES.
(PHOTO CREDIT: JOHN YOUNG)

Lighting

The lighting designer was Mike Billings. As with the set, the lighting package took an extensive journey through the red scissor department, with the first rental quotes being substantially over budget. Much of the set electrics unfortunately got cut at costing stage, but nevertheless the package remained large, and Tom Johnson and his Production LX team had a tall order to be ready for focus, bearing in mind that for much of the load in the Earth Piece prevented access to the overheads, most of which were on custom, diverted bars. **White Light**, led by Louise Houlihan for this production, were responsive and supportive throughout.

Sound

Thankfully the sound package required less of a journey than the lighting package, and I was fairly quickly able to agree a deal with Phil Hurley at **Stage Sound Services**. The Sound Designer, Gareth Owen, was using d&b's Soundscape system on the show, meaning speaker placement, and in particular front-fill placement was even more critical than normal. The orchestra pit and forestage area are in this instance, a crucial part of the scenic design, interfacing and moving with many of the automated elements, meaning there was much management of this delicate area to be done. The same is true of the FOH environment, where, without careful consideration, much of the PA could have been obscured by layers of string curtain. Even with everything drawn in 3D, the physical reality of the string curtain didn't quite reflect the drawing, resulting in some sensitively managed onsite adaptations.

Video

As is often the case, video and scenic were intrinsically linked, with the String Curtains forming a large part of the projection surfaces. The design and placement of the String Curtains ended up being slightly more organic than we might have liked, particularly front of house, meaning Projection Designer Jon Driscoll and his team had to adapt to evolving parameters. They did an excellent job of doing so.

To get the best value and the best kit, the video rental was split, with projection and servers coming from the aforementioned Stage Sound Services, and LEDs coming from **Universal Pixels**.



PROJECTION SHOWN ON FLOOR, SKY PIECE AND STRING CURTAINS
(PHOTO CREDIT: TRISTRAM KENTON)

Special Effects, Flying, Magic and Lasers

With assistance from Chris Fisher, I found the integration of special effects, performer flying, magic and lasers, demanding a substantial portion of my increasingly overflowing brain. **EventFX** took on responsibility for the flame effects, with Ed Samkin working alongside CTS to pre-fit as much of the system to the Earth Piece in CTS's workshop as possible.

Flying by Foy, led by their General Manager Nick Porter, took on all of the performer flying, along with some tricks proposed for the auditorium, which unfortunately got cut during previews. Grid real estate was extremely limited, necessitating much collaboration between Foy's, Unusual and the other departments.

MDM Props produced a simple but effective "levitation" lift, which allows Moses to levitate (who remembers their RE lessons?). CTS integrated this (along with various other tricks), into the floor and subfloor structure, and Absolute provided motor and control.

Lasers had been on the cards from the outset, to help create some of the magical moments of the show. I approached **ER Productions** on a recommendation from Jon Driscoll who had worked with them on Kate Bush show at the Hammersmith Apollo, and we soon found ourselves on a Kent industrial estate in a demo room with Mark Payne, who had recently joined the company after many years as a concert / music lighting designer. Lacking anyone within the existing Creative Team to “own” the laser design, Mark willingly stepped into the fold as a pseudo-creative. Unfortunately the reality of combining the laser effects with the other elements of the design in a way that wasn’t jarring to an audience proved problematic creatively, so even after several “laser sessions” during technical rehearsals the lasers also found themselves victim to the large red scissors. Mark’s enthusiasm for his lasers and his desire to collaborate with the rest of the creative team was duly noted and very much appreciated.

Stage Management

I couldn’t end this rambling piece (congratulations for getting this far!) without mentioning the Stage Management team. As we know, on a show of any scale the Production Manager / Stage Manager relationship is key, but on a show of this size, tech’d at the incredible speed required, it was even more vital. Dominique Pierre-Louis’s tenacity, drive and unflappableness (did I invent a word?) piloted us expertly and in high spirits through the long days and even longer weeks. I hope, in return, I was able to be a support to Dom and her team (Ryan Quelch, Tracey Farrell, Charlotte Johnson, Chrissy Huxford and Simon Humphris) with regards to pre-empting issues, limiting the number of surprises, and reacting quickly where required.

This show, more than any other in my career to date, has felt like a true journey. I think as Production Managers we all enjoy the moment of standing at the back of the stalls or the front of the circle, usually just as focus is getting underway and having the moment of “ah yes, it looks a bit like the model box”. But with Prince of Egypt, it wasn’t until having our first full audience that the production really came alive. The curtain call of the first preview, standing in a box alongside Dom, watching 2000 people give a standing ovation is a moment that I hope will stay with me for a good while to come.



END OF ACT 1

(PHOTO CREDIT: TRISTRAM KENTON)

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