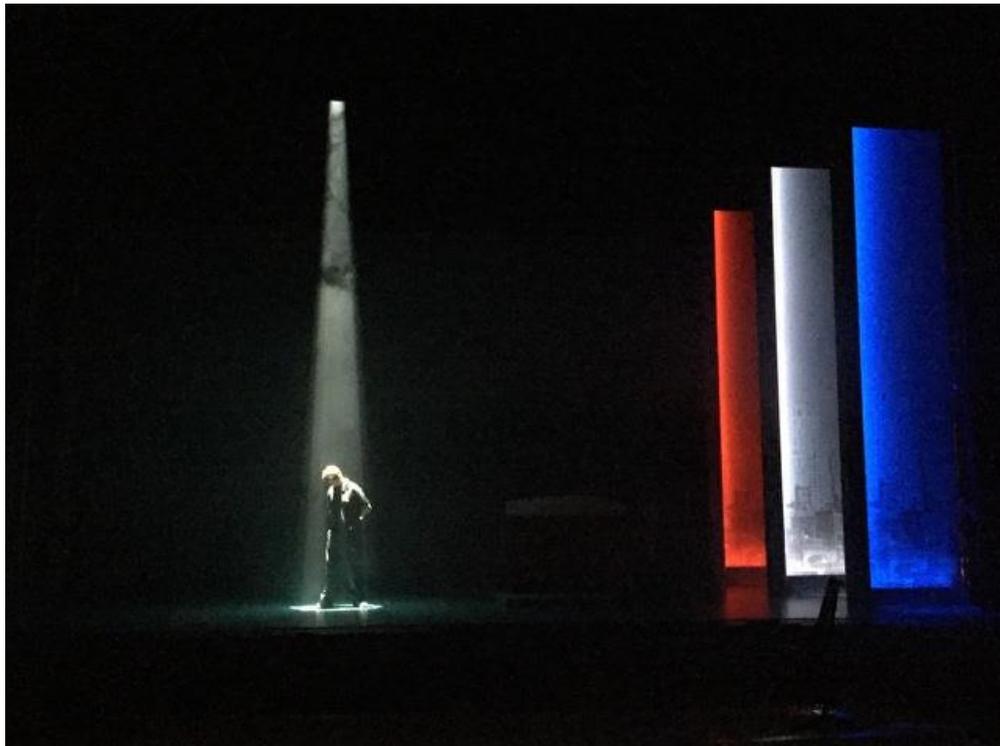


Backstage at the theatre: what it takes to power a show

Ever wondered what's involved in producing a theatre show? In this issue ABTT member James Eade gives readers a peep into backstage life and talks to some fellow members about their current projects and what the job of a production electrician entails.



Focussing. Once the system is installed, lights are positioned, focussed and programmed in preparation for being used during the show.

Theatre shows are incredibly varied in their scale and complexity, from the simplest amateur dramatics and school plays right through to big-budget West End performances. Common amongst nearly all of them is the use of power, particularly for lighting but also for sound, stage automation, video, effects and so on. Typically a production electrician will be responsible for designing and creating power systems for these as well as providing data control networks for the lighting. Production electricians are often also involved in the design of bespoke effects for performances such as flying cars (*Chitty Chitty Bang Bang*), flying elevators (*Charlie and the Chocolate Factory*) or magic wands (*Harry Potter and the Cursed Child*). These can be challenging as they have to be powered discretely and operated in a manner that appears imperceptible to the audience – it is the magic of theatre, after all....!

There is no such thing as a typical day for those involved in such projects, so what is it like to work on such shows? And how would one get started in technical theatre? We thought we'd ask four individuals responsible for many of the high profile shows that have been staged in the West End in recent years to give us their views: Nick Mumford, Martin Chisnall, Pete Lambert and Robin Barton.

Current projects

To give the reader an idea of the breadth of projects undertaken, we asked what current jobs they are working on. It should be borne in mind that some shows do have confidentiality agreements while they're in the making, so the descriptions may not be complete!

For Robin, the bulk of his current workload is manufacturing bespoke lighting systems:

"We're developing some custom control gear and LED fixtures for the National Theatre, working on an amazing new piece for Lucy Carter, a starry night sky for a whole auditorium, and a show set in a recording studio."

Far from most peoples' minds at this time of year is Panto season. But for Nick, work has already started on the planning of four of them at opposite ends of the country: Newcastle Theatre Royal, Edinburgh Kings Theatre, the London Palladium and the Birmingham Hippodrome. And that's not all:

"I'm currently the production LX ['LX' is theatre-jargon for *electrics* or *electrician*] for *Breakfast At Tiffany's*, currently playing in the West End then touring the UK, as well as being the Technical Production Manager for the UK tour of the Alvin Ailey American Dance Theater, starting at Sadler's Wells in September."

Martin has just completed a job that many would be deeply envious of:

"I've just finished *Harry Potter and the Cursed Child* at London's Palace Theatre where I was working as senior production electrician. Future projects include *The Entertainer*, the last show in the Kenneth Branagh Season at The Garrick Theatre; *Lazarus*, the new musical by David Bowie in a tent at King's Cross and The Commitments UK tour."

On top of all of that, Martin also looks after the *Mamma Mia!* touring productions both in the UK and internationally.

Pete is getting his passport up to date:

"I've just finished setting up the next *Wicked* tour, which is currently in Bradford, next stop Singapore. The next two years are touring in the Far East, then slowly heading back to the UK via a couple of European venues. It's my third *Wicked* project having set it up in London 10 years ago. Also, I'm working on *School of Rock* at the New London Theatre. We're just in the bidding stage and as usual there's not enough cash to pay for the kit the designer wants! I hope they sort it out soon, we're scheduled to load in in just over a month's time...."



Lighting being rigged and cabled onto a theatre's fly bar at stage level, before it is flown out to a show height of around eight or nine metres.

Variety is the spice of life...

As you can see, the work is varied and a lot of travel is often involved. But for many in the industry, theatre shows alone do not come around frequently enough to pay the bills and so work in allied areas is common. Martin's background though has always been theatre:

"When I first went freelance I did a much wider variety of work; events, corporate, exhibitions, even a little bit of TV as well. But now I do almost exclusively theatre, although increasingly I now also teach and carry out consultancy work."

Robin's work is also mostly theatre based, although he also does some infrastructure and systems work, such as installing new lighting control networks, for example. But for him "the corporate and events market is an important sector for us too, it is not just 'filling in' between other shows."

Pete spends "a good 80 % of my time purely on theatre shows, but I go off and do a bit of corporate work mostly for a company based in Woking."

Recent years have seen Nick more and more focussed on theatre shows although "I do still occasionally get involved in a wide variety of other events. These range from conferences and other corporate events to fashion shows, site-specific productions, television work, parties, ice-rinks, sports events and so on."



Almost theatre, but not quite – backstage lighting dimming, distribution and control for the BBC EU Referendum debates in Wembley Arena.

So what do you actually do?

Nick and Martin concur on the description of the role of a production electrician as being someone who:

“Takes a designer's lighting plan and assembles all the component parts to deliver a fully functioning lighting system with which they can light the production. That involves liaising with the designers (lighting, and sometimes set designers), the lighting company that might be providing any hired equipment, the electricians in the venue (or venues), along with the Production Manager and the crew chiefs of other departments who might need power or other integration.”

Martin points out that it involves “a lot of lists: lighting equipment lists, colour lists, gobo lists, moving light configuration lists, cable lists, rigging lists, DMX [data control] addressing lists, budgets, crewing lists etc ...”

Once all the equipment is specified (and approved on budget!), the next stage is to spend some pre-production time building the rig into a kit-form to ensure quick assembly when on site. Nick goes on to explain that:

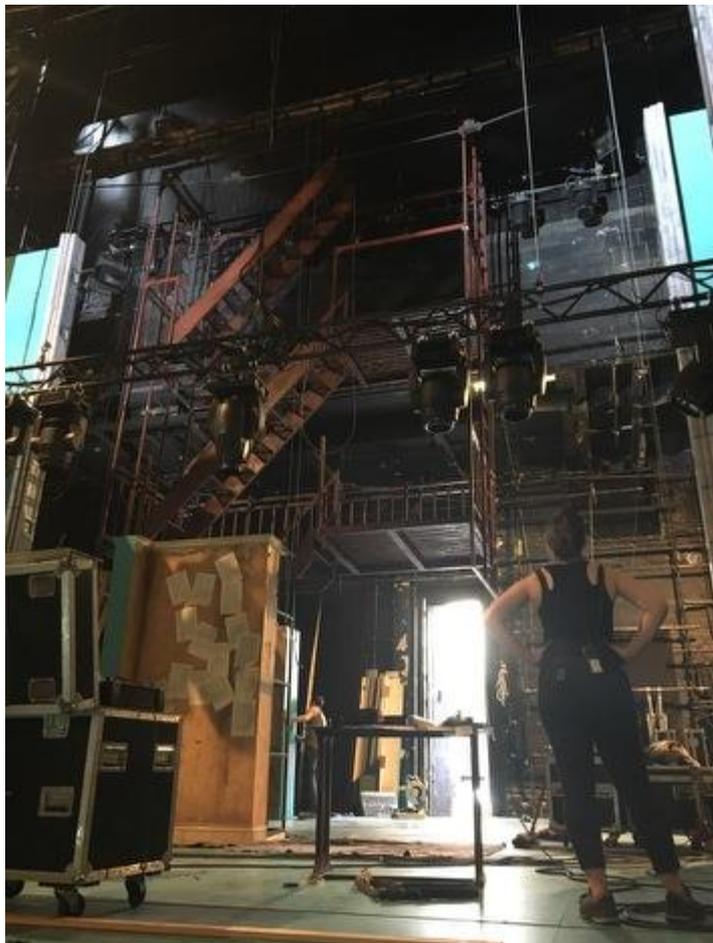
“The role then involves installing the system in the venue. That means working with the venue's local crew and guiding them through piecing together the kit that you have prepared in advance. Once everything is installed, functioning and the lights have been focussed to perform their intended tasks, the role becomes one of tech support to keep the increasingly complex equipment that is used functioning throughout the show's creation process.”

This process is then reversed if the show is touring and it gets packed back up and loaded onto the trucks to go to the next venue to be re-created. This happens multiple times on tour in different locations, often under fairly intense time constraints.

Robin highlighted the close liaison with the creative minds involved in a show:

“Sometimes we are involved from the conception, other times *slightly* later, but we are always there until the end. A large part of our role is to interface between the creative and engineering disciplines. From my perspective we specialise in delivering unusual projects – from miniature ‘invisible’ items to larger projects such as flying 100 kg of lighting equipment across a stage in a 24 m by 9 m arc.”

Martin agrees that “the designer and I must work closely as a team and occasionally my advice or opinion may be sought. Sometimes I can’t help myself and offer my opinion anyway! Sometimes a designer may have an idea but not know the best way to achieve it in practice, or know if it is even possible. I may be asked if I know of a fixture that has a particular set of features, or produce a special effect.”



Different scenic and technical elements jostling for position halfway through a show build.

Nick notes that “whilst the lighting design is not your responsibility as the production electrician, an understanding of it is essential to be able to specify and manipulate the equipment in such a way as to make its delivery possible.”

Pete acknowledges that “as I get older there are an increasing number of youngsters picking up the baton. I really enjoy working for them and being paid ‘from the neck down’ – sometimes when you’re in charge you don’t get to do some of the basics, like actually using a light. That’s something I have always enjoyed.”

Electrical design work

The electrical considerations are not quite the same as ‘traditional’ electrical design as Martin explains:

“I work out how everything is going to be plugged up. Where is every piece of equipment going to get its power from? How long a piece of cable will it need? What size cable with what connector on the end? Does it need a dimmer or non-dimmed power? How many dimmers and MCBs in total will I need? How much total power will I be likely to need? Will I need to get more dimmers, or distribution equipment, or even more power? How many DMX slots does it require? Where will it get its data from? How will the lighting equipment be physically rigged? How will it be maintained?”

Nick neatly describes what they all agree on, and that is that the electrical planning and prep time is hugely important.

“Whilst it is a reasonably short period relative to the amount of time a production may be on the road or sat in a specific venue, how productive that period is really dictates how smooth your life will be for the foreseeable future.”

The electrical equipment used on theatre productions is very much of a ‘plug and play’ nature. This is to enable the quick assembly of systems and to be able to take them apart again quickly too. Often this needs to happen in a few hours overnight, possibly the day before putting it all together again a couple of hundred miles away.



Mains distribution equipment backstage. The rack on the left is a 108 x 10 Amp channels of single phase power distribution, in the centre is a 16 way three-phase distribution unit, the rack on the right is control data distribution.

The starting point of the electrical design is really concerned with the safe loading of these distribution systems when they are hooked up to the power supplies available in the theatres that the show is visiting, the electrical characteristics of which are often unknown. Nick explains:

“A sensible level of discrimination is necessary, both from a safety point of view (earth faults, isolation and switching etc.), but also from the point of view of user friendliness and ease of operation. Given that these systems are being repeatedly taken apart and put back together by different crews each week (albeit under the supervision of the production electrician), the system needs to be robust and clearly labelled to make sure it is assembled as per the specification each time.”

A certain amount of flexibility needs to be designed into that system too. You can be sure that, certainly in a show's early days, there will be changes to the lighting design. The creative team are not generally concerned about how many spare ways you have left on your distribution equipment or dimmers. Nor do they worry about how you are dealing with phase balancing during a show where the demand is constantly shifting as different lights are used in the different scenes being played out onstage. From a design point of view, they might suddenly require the biggest light they can find to be rigged in the most inaccessible position possible, where you previously had no power or data infrastructure in place.”

As well as the instruments lighting the stage, there may be electrical elements that form part of the production's scenery. At this point it can become part of the production electrician's role

to specify and install some of this, whether that is more lighting or other practical, electrical items. This can sometimes be more of a traditional 'install' type of job, where the electricians are more permanently fitted to remain part of the set as it travels. Often now it is a job for a separate electrician, or team of electricians, given the tendency for many bits of scenery or props to have to light up. Since the arrival of LEDs, this has become an area that can involve wiring jobs that are much more bespoke, involving a soldering iron rather than a plug and socket.

Martin noted that the job is also 'systems integration':

"Taking a load of random equipment from different manufacturers and making them all work together to produce a show. Increasingly I also need to be a computer network engineer as increasingly there are as many IP as there are DMX addresses to be configured."

But Pete sums up the process quite elegantly: "As an old friend and colleague, Dobin, used to say, "we turn the ideas and dreams of the designer into a working reality".

In the next issue of Wiring Matters, James speaks with Nick, Martin, Pete and Robin about their best and worst experiences, and advice they would give to those wanting to work in theatre.