

# ALD # FOCUS

The Journal of the Association of Lighting Designers  
"More art, less tools..."

December 2019/January 2020

*In the candlelight this issue:*

- Carols at King's
- Remembering Ali Grant and Chris Ellis
- Postcards from India and Austria
- The trouble with LED
- ...and much, much more...

Price to non-members £5.00

*Carols from King's  
Lighting director: Bernie Davis*

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# From the chair...

As 2019 comes to a close and a new year begins it's interesting to know that it's the time of the Winter Solstice, the time of returning light, where in the deepest darkness of winter we can reach to the sun and herald in the beginning of the new light – a time of year that gives us all a little time to pause and reflect on our journey throughout the year and to start to develop our plans for the future year to come. I use the word reflect, because I feel in these days of social media and fast goals we often mark everything through success and fame when often our achievements are so much greater than that.

Our real achievements as entertainment lighting practitioners are in the smaller joys of sharing what we do with others, whether that be giving entertainment to children over the Christmas period, which many of our members have been doing tirelessly for the past month, or working on a production that has stimulated an audience into looking more deeply into the world, or creating a moment of beauty in a place with the use of light. We are all providing a great service to our communities which we can be proud of.

As the year comes to a close for the ALD, I'm also reflecting on the amazing achievements of our Exec team over the past year. These are the people who give

up their free time to make our industry just a little bit better. They give up their time to organise events, attend union meetings, celebrate young talent through awards, and help make us become an organisation that wants to help and listen to our members, whether young or old looking for advice or support when needed. Every Exec member has at some point this year given up some of their own precious free time for someone else and for that I am very grateful and would like to thank them from my heart.

Sadly, this year the Exec saw the loss of one of its team players, Ali Grant. Ali was clear headed and practical about all aspects of what we do as lighting people. I will miss his clear and often insightful input into many debates around the Exec table. He was willing to give us a greater understanding of his role as production electrician and how that translated into the work of the Exec. My deepest condolences go to his wife and family at this time.

But what to the future at the ALD. We are adding lots of new contracts and supportive advice to the website. We are starting discussions with producers about what we do and how that affects our work. Robbie Butler is now the chair of the Equity Designers Committee, and though their process is often seen as quite a slow upward struggle, we are starting to see



Johanna Town  
ALD chair

some movement and most importantly an understanding of the work we do in the 21st century. We closed this year with some great meetings, including a fantastic and insightful discussion with Peter Mumford, chaired by Vicky Brennan, on Peter's career in lighting design. Peter was also honoured with a fellowship of the ALD for his contribution as chair and his amazing career in theatre. There are plenty more interesting events and meetings already being planned for 2020 so do keep a look out for ALD bulletins.

My wish for the coming year is to see the work of the ALD continuing towards a more diverse and open community, continuing to encourage lighting design and lighting practice as a sustainable career choice, and being a light in a dark space that members can turn to. As an organisation we are growing and building, and with your help I hope to see us grow even more over the years to become an active and most importantly proactive organisation for us all to enjoy.

I would just like to wish you all a very happy 2020, and see you in the new year.

# The ENO and fixed rigs

Lucy Carter on how to make the most of a fixed rig



I have just been designing for an opera at ENO: *Orphée* by Phillip Glass, directed by Netia Jones, with set designs by Lizzie Clachan. It was my second experience working for ENO, a full-time opera company, based in London. Its performances are sung in English at the London Coliseum, a spectacular venue to work in. Its vast auditorium and extreme proscenium opening are quite daunting when you first begin lighting a production there.

Designing for repertory opera and ballet is quite a different process, and I have written about this before in one of my previous articles. What I always find fascinating, however, is what the standard or fixed lighting rig offers –

what is included and what is missed off. I am always aware that each standard rig has developed over many many years, with many lighting experts contributing options and opinions as to what should be included. The rig at ENO is no exception, having been originally created as a copy of the Sadlers Wells Opera Company rig when they first came and did their touring season (yes, the Coliseum was considered a touring venue for them, travelling all the way from the suburbs of Islington into town!).

At present the lighting rig offers a large degree of flexibility while maintaining a lighting rig that can, when needed, still service the ENO's older repertory. They still have over 50 "live" shows in their repertory to draw upon, and this season they are performing one of their oldest productions in rep, *The Mikado*, which was premiered in 1986 and is lit by Davy Cunningham. Alongside this they are creating four new operas that all have different lighting designers: *Orpheus in the Underworld*, lit by Malcolm Rippeth; *Orpheus and Eurydice*, lit by Jon Clark; *The Mask of Orpheus*, lit by Peter Mumford; and *Orphée*, lit by me.

So the basic ENO lighting rig needs to support those five lighting designs and

offer enough flexibility so that the lighting team can do a changeover during the afternoon from the previous night's opera and get the next opera ready and focused for the following night.

I decided to try to find out more about the origins of the ENO basic lighting rig, and so I grabbed a coffee with Kevin Sleep who is head of lighting and has been since 2002. He took over from Dewi Evans who had been at the ENO since 1974 and who became head of the lighting department in 1990. Dewi still works at ENO as the technical resources manager, and he managed to join us for coffee as well. It was such a privilege to sit down with both of them to hear how things have changed over the last 45 years.

Dewi tells me that the infrastructure of the basic rig, the lighting positions and systems they still use were put in by Charlie Bristow, the chief electrician from the Sadlers Wells Opera, when the company moved permanently from Sadlers Wells to the Coliseum in 1968. He basically created a larger-scale version of the Sadlers Wells lighting rig. So positions such as the box boom, speaker boom, pit edge, dome and gallery have all

*Orphée*  
English National Opera  
Director: Netia Jones  
Set designer: Lizzie Clachan  
Costume and video designer: Netia Jones  
Lighting designer: Lucy Carter  
Photographer: Catherine Ashmore



existed for decades. The equipment has obviously changed and been updated but the locations of the different systems of lighting have remained the same.

Then, of course, the rig consisted of stalwart generic units, things like Sil 30s, Sil 10s and par cans front of house, Cadenza 950s in the dome, cadenza effect units, Howie battens as footlights, and Cantatas and Cadenza PCs on stage. These were, from 1985 until 2003, run

from approximately 390 Permus, STM and JTM dimmers, with an intricate switching system, and a massive 15amp patch panel on the technical gantry on the side of the stage, which was 20 feet long.

In 2003/2004 a restoration was carried out and the dimmers were increased to approximately 1,400 Strand dimmers. These were allocated everywhere but were hard wired, and Kevin remembers that – unhelpfully – the four-figure numbers were

in the most-used positions and the lower numbers in the least-used positions. What they have now is 1,200 ADB dimmers, which replaced the unreliable Strand dimmers in 2013. They run a permanent soft patch for the opera seasons, which ensures any historical rep can come back and have consistent channel numbers.

As I said, the lighting positions originate from 1968, but during the restoration more bars and positions were added, such as balcony front rails and the positions in the corners of the balcony. Dewi credits Nick Shelton, who designed the lighting for a large proportion of the repertory during the 70s, 80s and 90s, as adding and shaping the rig further during that period.

Dewi tells me that before the advent of moving/intelligent lights, when the rig consisted of a large number of generic lighting units, they would, in the afternoon changeovers, think nothing of focussing 300 to 400 lanterns. That means that once the rehearsal of another opera in the morning had finished, around 1–2pm the sets would be changed over, and once the set was in place, the lighting teams would focus all those lights for that evening's

# The ENO and fixed rigs

Lucy Carter

performance! Kevin said when he arrived at ENO and as the sets got bigger and more complicated they restricted the number of lanterns they could refocus to 200 or 250. This was because as the time got reduced for the lighting teams they couldn't ensure they would be ready for a 7.30pm performance unless they kept the focus required to around that number. It's a different situation now because the lighting rig does contain more moving lights and so checking the presets becomes a quicker job to some extent.

Kevin and Dewi say that the lighting fixtures in the basic rig have just evolved as it's gone along. Replacing some units with intelligent lights, and adding things into the basic rig, if they are consistently being requested by lighting designers again and again. It's essential to stay mindful of existing rep, some of which is from 1982, which was before any intelligent lighting. So replacements and upgrades have to provide what those shows require as well as offering new possibilities for new productions.

The basic rig now consists of about 350 lighting fixtures, and unusually for an opera house venue rig, only twelve

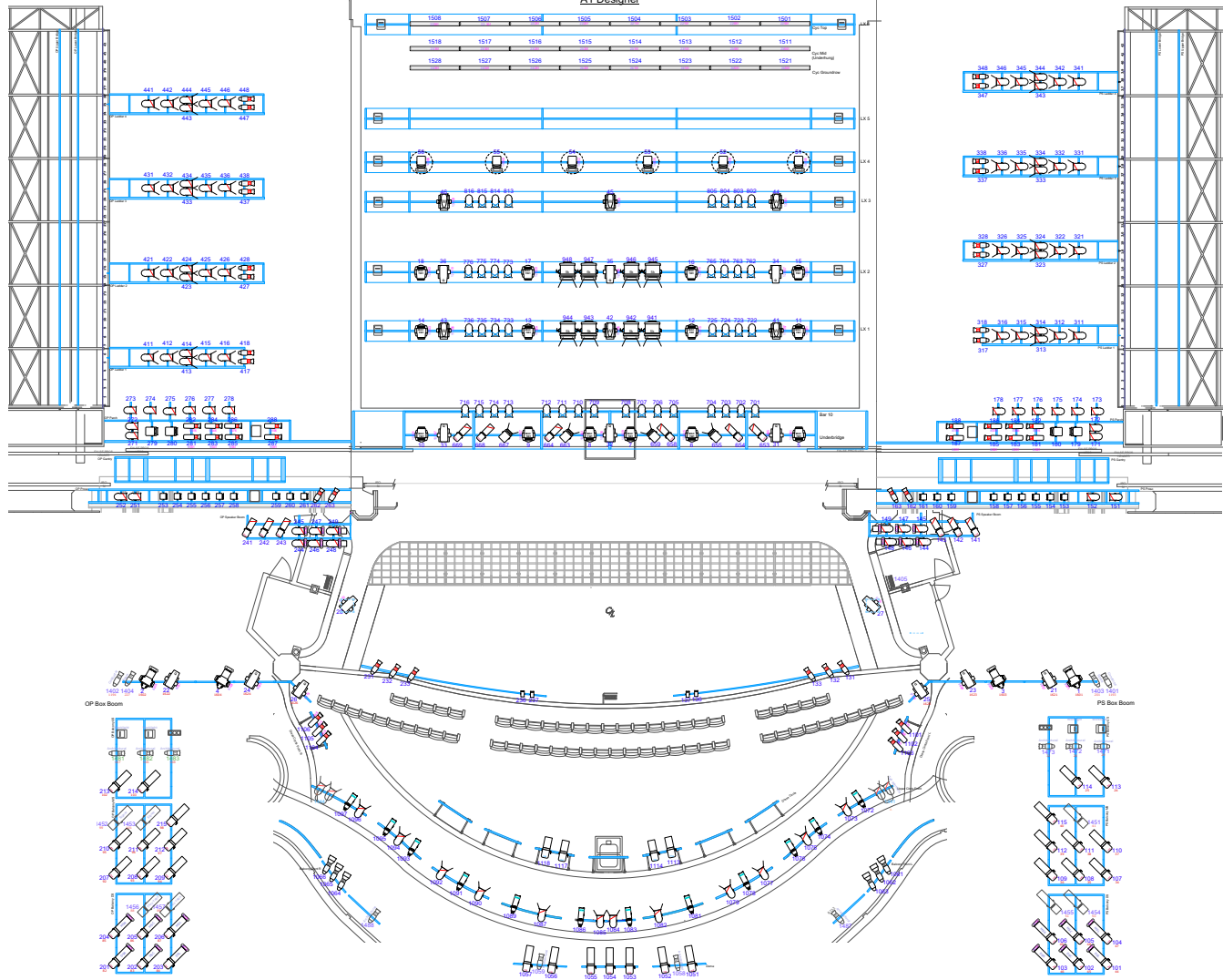
of those units are fixed focus and not to be touched. These are the Robert Juliat profiles in the front-of-house far box positions, with scrollers, which provide a consistent and failsafe front-of-house cover, with colour options.

The thought behind not having lots of fixed focus units is that it offers a lighting designer as much flexibility as possible but gives them an extensive lighting rig, with lots of units in many positions, which means that fewer extras need to be added, because as a lighting designer working on a new production you feel confident you will be covered when new challenges arise, as there are lots of options – something that the new season, with four new operas and a revival, has benefited from but also fought against.

So I wanted to find out how the other lighting designers in this season had added to and used the rig when they were designing their operas for the season. Peter Mumford and Malcolm Rippeth kindly answered some questions via email. Peter requested eight Encores and 16 Lustr pipe ends to be added to the existing rig. He ended up with six Encores on the advance truss and eight sets of two

Lustr pipe ends, on each overhead pipe. Peter also designed the projection for his production, and his reasoning for these requests was because he needed the steep angle from the advance truss with shuttering units so as to not disrupt the video too much with light spill. The Lustrs provided some cross light; sidelight was not possible as the set was a box. Peter also required the VL3500 units that sit on the pit walkways, which he has used there before. Kevin told me those units have now become part of the standard rig because everyone was using them in their designs.

Peter found the side pros and FOH/ speaker boom position, as well as the comprehensive overhead rig, to be the most useful to him. He was using concentrated colour on white walls and there was a glass wall that was flat to the audience, and so it was impossible to use any other front-of-house units without bad reflections and disrupting the projections. Interestingly he found the overhead rig worked well, but the mixture of old and new automated fixtures – VL3500s/TW1s/ Encore washes/Encore profiles – meant that the mixture of colour temperatures was tricky to contend with. Because it isn't



**Legend**

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# The ENO and fixed rigs

Lucy Carter

a personally designed bespoke rig, he would often find there would be a warm unit where he needed a cool, or a profile when he needed a wash, etc. Our beloved TW1s are possibly now underpowered, and it's increasingly difficult to colour match them to Encores, for example. Malcolm also praised the availability of moving fixtures, saying, "I ignored most of the generic fixed rig, mainly because there proved to be no opportunity in the schedule to focus it, and much I could manage with movers instead. Having a four-act opera on four distinct sets, with everything delivered late, meant the first time I saw each layout was (at best) at the start of the relevant stage and piano, when it was much too late to get out a Genie or send teams front of house. So the biggest change to the ENO fixed rig which would help is certainly the addition of more moving heads."

I also asked Peter what he enjoyed about working with such a comprehensive rig that has fixtures in almost every position possible. He said, "I'm a 'palette' person so I like to have a flexible rig where I can invent and reinvent easily and quickly. I also like to be able to change a

state live through movement and colour mixing rather than just crossfading. I suppose I enjoy it most when it's my own 'comprehensive rig' like I have just designed and worked with for the Grange Opera season." He also said, "It's tricky to accommodate four different lighting designers with four different sets and make everyone happy – a comprehensive rig needs to be truly comprehensive and that costs money. I think that a company that wants to achieve an automated rig that will provide a universal service and palette for a wide variety of designs has to invest quite substantially in the first instance and then be prepared to renew and replace equipment. It's also true that any 'basic' rig needs to still leave space for some additions that are particular to individual productions – that will always be the case."

I asked Peter if his process differed when he was designing for a company with a standard lighting rig. He said that his process didn't change, but he just had to find a way to make it his own. Malcolm described his process as starting with "mental pictures, which are then translated into colours, textures and

angles, thence into fixtures and positions, then rationalised into an achievable flexible rig. My early experiences with rep rigs were unsettling, as I found myself too soon trying to work out how to create my mental picture with the lights available, missing out a sort of free sketching stage. After years I've realised the best route for me is to stick with my original process, not getting bogged down in equipment too soon. Having said that, big rep houses tend to need to know very early what I'll need in terms of extras, which is an important deadline to meet. Which opens up another thought process, being what can't this saturated rig do that I might need? With moving light rigs I tend to be able to spot the missing position which I'll really need. In generic rep rigs it's harder, as I can't have worked out accurately how I'll need to focus every unit and therefore where the gap is. The usual thing then is to hope to squeeze moving heads into the most useful positions (as per *Orpheus* at ENO) and hope that's the right solution."

Peter summed up his experience and thoughts by saying, "I would like to say again that I think that the ENO lighting teams do a great job under the

*The Mask of Orpheus*  
English National Opera  
Director: Daniel Kramer  
Set designer: Lizzie Clachan  
Costume designer: Daniel Lismore  
Lighting and video designer: Peter Mumford  
Photographer: Peter Mumford



place on furniture that tracked across the stage on two sets of tracks, between the projection screens. Therefore, I also added a couple of additional VL3500s to the standard rig to ensure I could always light the performers in very tight areas and have a system of three units across the stage.

Peter's Encores provided the advance bar position I needed, and his Lustrs were extremely valuable to add

circumstances – it's interesting to note that the 'spanner in the works' was adding *The Mikado* (a revival) into the middle of the Orpheus season, which meant a complete re-rig in and out when the basic season rig was working reasonably well and achieving turnarounds that didn't involve overnights, etc. If a company wants to create a fully automated overhead rig to make changeovers easier and cheaper it needs a great deal of thought and investment in the first instance and being prepared in some cases to relight older revivals to suit the new rig. Many companies have done this successfully but it does need a lot of

thought and consultation – then it can be very successful."

It was great to hear Peter and Malcolm talk about the same issues I had encountered. In fact, as each of the four lighting designers requested various things in addition, the choices Peter had made were all extremely useful to me for my production. The advance bar profiles were a necessity to me as I too had projection screens all over the stage, flown screens, floor projection, back screens and full-stage/all-over-the-set projections. I needed shuttering profiles in three corridors across the stage because the action took

sculpting and brightness when I refocused them into my corridor areas as well.

I really needed sidelight so that I could float the performers and not disrupt the floor projections, and so I added six Viper Performances on floor stands and two rigged into trucks on the set in order to get a flexible and shutterable sidelight. In fact, we ended up substituting two of the Vipers for GLP 350 profile units because we needed very small units inside the trucks to prevent the tracking furniture hitting it. I also added some other GLP equipment that was loaned to me so that I could trial them for future

# The ENO and fixed rigs

Lucy Carter

projects. So thank you very much, GLP UK. I couldn't use the overhead No.2 batten, because there was a flown gantry that was hung below it, as part of the set design. Therefore, the upstage tracking furniture and all the scenes that took place there were not going to have any automated profile units located in the right place to light those scenes. On the middle of LX1 in the basic rig there are four 5kw fresnels with scrollers that take up a lot of room, so Gary James, my lighting supervisor for this opera at ENO, managed to squeeze four of the GLP 350s into the gaps. It was lucky that the GLP fixtures are extremely small and took up very little room!

I was also pleased to know that the pit walkway units have now become part of the standard rig, and the extra movers on the circle front added for the season could be used as flat fills when needed to get around all the moving set elements I had to contend with. In the end, I used very little generic equipment, some sidelight Source Fours on the downstage proscenium perch and speaker booms, and a few parcans and profiles for bespoke sidelight through doors and frames in the set.

I also used the three followspots as part of the look, not just as illumination fill. We were going for a film set aesthetic, so it could appear as if we were filming rather than staging a stage show. The followspots helpfully added light to the performers' faces as well as reinforcing the film set aesthetic.

I know that Jon Clark added 15 Xbars to the rig, and we were all hopeful that we could use them. They make a great addition to the rig. Jon ended up using them almost exclusively, bar some sidelight and some from front of house. Sadly, my desire to use them to track across with the moving furniture across didn't come to fruition as our extensive fly plot meant there wasn't room to keep them. Peter similarly was pleased to see them in the rig but found them less useful because they were spread out and not rigged end to end in a continuous line.

ENO is about to start a four- to five-year programme to change all the lighting equipment. I discussed this with Kevin and Dewi, and they talked about how the scrollers needed to be replaced –probably with a moving head, which would offer more flexibility – alongside the TW1s being

*Right: The Orpheus season composite rig plan*

swapped for a new wash light. Kevin and his teams are looking at what has been used in the last five years and why, what units are on the critical list because of lamps being discontinued, and then what is on the market at present to replace them all with. I can see what a difficult job it is to make sure the historical productions can still be achieved while keeping up with the fast pace of new developments in technology, so the new productions can keep creating new and modern aesthetics.

I really enjoyed working with the great technical teams at ENO and have especially enjoyed learning about the development of the lighting infrastructure and basic opera season rig.

Thanks very much to Kevin, Dewi, Peter and Malcolm for talking to me.

I hope you all have a very good Christmas and wish you every success for the new year. 🍀



# Christmas lighting

Mark Jonathan returns to panto



Last issue, I wrote about how our success is related to being supported by fine, high performing teams, and as the autumn season progressed I was further reminded by the brilliance of two organisations that operate against the most stringent pressures. I returned to the Birmingham Royal Ballet for *Giselle*. I lit this production 20 years ago with stage and costume designs by the late, great Hayden Griffin. I welcome the chance to go back and check over the lighting. Inevitably, some of the light sources have changed and maybe our “lighting taste buds” have changed a bit too. As is the norm, the BRB technical staff are up against a demanding schedule with a changeover on Sunday, and we

need to be ready for a piano rehearsal on stage on Monday evening, a second run on Tuesday afternoon, then orchestral and stage rehearsals on Tuesday evening and Wednesday afternoon with the opening on Wednesday evening. This being ballet, there at least three casts to field, so no sooner are we looking at lighting for the first time, photographers arrive to catch the different casts. The great dance photographer, Bill Cooper, is in attendance. We have known each other since I lit my first ballet 25 years ago. Bill is always relieved when I don't light too darkly, and while I think the capability of the cameras has improved so has my generosity to visibility over atmospheric darkness!

The BRB lighting, stage crew and stage management teams work very well together. I'm more than happy to be reunited with them all; ALD member and LD Peter Teigen is the BRB lighting consultant, with the ever-smiling Jonny Westall-Eyre as head of lighting and deputy Andy Wilson. In these tight schedules an excellent programmer is essential, and I'm delighted to work again with Alastair Phillips, who has a fine eye for light and nimble fingers on the keypads. Despite

the shortage of time, the teams remain buoyant and calm; everything is under the watchful eye of senior stage manager Diana Childs. While I'm happy to be back in Birmingham, I miss Hayden, the designer, but everyone works hard to ensure his design vision is restored. *Giselle* looks as fresh as ever.

Job done, I travel back to London. The same week, Thomas Cook goes under and I have five days' notice that my holiday is cancelled. We change tour operators and holidays from Greece to Turkey. So with *Giselle* under my belt I travel for a last week of sunshine. I recharge and observe some spectacular sunsets and a wild storm with more lightning effects than I have ever used.

It's onto the Royal Ballet at the Royal Opera House and another revival. This time, it's *Sleeping Beauty*, which premiered in 2006 based on the Oliver Messel designs of 1946. It's an opulent design with inspiration from Jean-Honoré Fragonard but it needs a lot of TLC in the focusing. I join the lighting team, led by Matthew Mulberry and Allan Ramsey, under the experienced eye of senior lighting manager Les Bone. The calibre of

*Giselle*  
Birmingham Royal Ballet  
Production: David Bintley and Galina Samsova  
Designer: Hayden Griffin  
Lighting designer: Mark Jonathan  
Photographer: Bill Cooper



focusing is extremely fine, and this makes all the difference to the many gauzes and cloths that adorn the production. Like BRB, the Royal Opera House staff work under constant pressure to use every minute in the day so the finest skills are essential. I certainly enjoy and appreciate having the excellent lighting eyes of Matt and Allan. On one morning I arrive for a stage rehearsal and the stage crew have cross flown over one hundred pieces of scenery, such is the intensity of the rep. While I'm there, LD

Lucy Carter arrives for a projection test slotted into the lunch break on a Sunday, for a ballet she will light next year. Paule Constable is in the opera rehearsal room for the opera *Death in Venice*. Of course, it's great that the UK's biggest opera and ballet institution is so productive, but I sense that everyone is worn down by the intensity and the constant lack of time. I vow to try to not slow things down, but *Sleeping Beauty* is four acts and three of the acts have pyrotechnics with demanding transformations, one that culminates in a

boat journey to the castle that has been hidden for one hundred years. We barely have one hundred minutes to check the entire lighting states.

As we work through rehearsals I add in more light on the scenery, aware that the *Sleeping Beauty* will be broadcast for the third time worldwide to cinemas. On the first occasion, it was the first-ever cinema broadcast from the ROH and frankly it looked dreadful. There was very little time to make adjustments and all the scenery disappeared against the brightly lit principal dancers. Ideally, I like to have a monitor on the production desk to review the stage picture on screen. In this case, I'm doing it by eye which is by no means ideal. The broadcast isn't until January but I hope it will look ok. Finding the balance between a live audience and the needs of the camera for cinema is a challenge.

I'm pleased with the outcome at the Royal Opera House and, leaving this sublime ballet, I travel to York for the pantomime season and, yes, it's *Sleeping Beauty*. So having already ticked off two different versions of the ballet and an ice show version I now find myself with the panto. It's been a while since I was

# Christmas lighting

Mark Jonathan

involved in this very British indigenous art form and inevitably my mind remembers all the different Christmas shows and pantomimes I have worked on over my career including many *Cinderellas*, *Aladdins*, a *Humpty*, *Mother Goose*, *Dick and Puss*, although I never did a *Jack* – not to

mention the many non-panto Christmas offerings from *Peter Pan*, *Larry the Lamb*, *Old King Cole* and *The Witches*, which in my case have been interspersed with ballets, operas and two ice shows. I am reminded that I previously lit *Richard III* at the Theatre Royal and indeed my first opera in the York

Festival back in 1976. It's a pleasure to be back in this city with so many medieval landmarks.

York Theatre Royal has a long history of home-produced pantomimes under the dame and authorship of Berwick Kaler, who this year retires from 40 years of being the much-loved dame but is still writing the script. I step into LD Richard G Jones' glittering panto shoes who has lit this gig for 22 years. The staff are both welcoming and highly talented. The chief is Mike Redley, who shows exemplary skills in creating the swathes of sound effects as well as the live mix, while the considerable set and production electrics are led by the talented deputy

*The Sleeping Beauty*

Royal Ballet

Production: Monica Mason and Christopher Newton

Original designs: Oliver Messel

Additional designs: Peter Farmer

Lighting designer: Mark Jonathan

Photographer: Helen Maybanks



chief Craig Kilmartin along with Johnny, Harri and Hazuki. The very brilliant programmer Rohan McDermott joins me on release from *Six*. I'm mightily impressed with how fast Rohan can set up effects and hit the beat of the music. The production and technical staff at York enjoy being in the room and this makes putting the show on a pleasure.

Rohan and I work the rig hard, and I enjoy having some good quality LED fixtures and swathes of LED tape too. The response time for snap cues is great. I was very interested to receive a comment from Jonathan Dawson- Butterworth who took exception to my comment that

I made in my previous article about cheap LED spotlights. Jonathan pulled me up on my suggestion that some crap LEDs might be "ok for rock 'n' roll" but they had no place in theatre productions. "Oh no, it isn't," cried Jonathan. Basically, we agree that we haven't the time or patience to try to cope with bad fades or inadequate



colours, and as Jonathan told me that includes "rock 'n' roll". For a more fulsome response from Jonathan please see his article on page 25.

If I don't see you at the annual Christmas lighting lunch I hope that whatever shows you're working on go smoothly and that you will be rewarded with a very Merry Christmas and an exciting new year! 🍀

*Above:  
Sleeping Beauty  
York Theatre Royal  
Directors: Berwick Kaler and Matt Aston  
Designer: Anthony Lamble  
Lighting designer: Mark Jonathan  
Photographer: Anthony Robling*

# LED changes everything

Nick Moran with some things to consider...

So most of us have seen LED fixtures that, in most if not all senses, “work” as stage lanterns. While there is still kit out there that is not up to the job (as Marko pointed out over the summer), the best LED fixtures have changed designers’ minds and often stretched capital or hire budgets!

But this article is less about how LED is changing design practice and perhaps stage aesthetics, and more about how it is changing production practice, challenging some of the ways we have put lighting rigs together for the best part of a generation. I hope it will be the beginning of an Association-wide discussion that will result in us sharing what we might call “best production practice” in a number of areas.

My starting point was the RCSSD Bridge Project, which is a three-week season of Shakespeare adaptations that many a Central lighting student has cut their teeth on over the years. For that last three years for various reasons, the project has been all LED. But that is a studio production, using around 30 fixtures. To provide a larger scale perspective, we called on Professional member and ace production electrician Martin Chisnall to come and talk to some of the next generation of lighting

practitioners at Central. He shared his thoughts and showed us his production plans for the almost all-LED *Mamma Mia!* UK tour, featuring the COTPADD (Chissers On Truss Power and Data Distribution) of which more later.

## **Power consumption – less amps?**

One of the main drivers for the change to LED is that we can light shows with a lot less electrical power. Of course, this can mean significantly reduced running costs of the project, but it can also make it possible to provide high-quality lighting in places with about the same amount of electrical power you might have in your kitchen. I understand that the first reason was what motivated Bill Kenwright Ltd to become early adopters of LED lighting on their shows – the significant reduction in the amount a venue can charge them for a show. The second reason enabled Central students to deliver a six-area cover (front, back and sides) with specials, over a seven-meter-wide acting area, in a hall with only two ring-main circuits. The ability to power a decent-sized rig from essentially domestic power has also meant that many parties and events, in tents and historic

buildings, now have more lighting, without the need for external generators.

## **My rig has put on weight!**

There are a few other things that immediately strike you when you first use decent quality LED fixtures. They weigh more! The LED profiles are around 2–5kg heavier than their tungsten mates, but the LED Fresnels and PARs are sometimes more than double the weight of the fixtures they replace. Now you might need fewer units when you get your warms, cools and saturates out of each one, and you will probably be using less cable (see below) but on a big rig the additional weight adds up pretty quickly. *Mamma Mia!* tours the overhead lighting on pre-rigged trusses, not just for this reason, but weight is one of Martin’s considerations here.

## **Data – more addressing, channels, nodes, splitters and paperwork!**

An LED rig gets bigger in other ways too. We need to get data into all the fixtures, not just the movers. That means addressing each fixture, and then making sure each one goes in the right place. If we want the rig to go up quickly, it’s probably

best to pre-address the fixtures and label them so they end up in the right order along the bar or truss. (Now, some of you may be saying that we could use RDM to address the rig later and Mr Chisnall does exactly this for Lustrs, which means any of them can go in anywhere a Lustre is needed on the rig and all that has to be checked is that it has the right lens tube – just as if it were a tungsten Source 4 profile or PAR.)

With the dramatic increase in what each fixture can do comes a similar increase in the importance of logical planning and documentation of how data gets around the lighting system. With a conventional tungsten rig, if the plugging all gets a bit confused someone can always flash out from the dimmers or just plug lines into “hot power” to check a circuit. With a rig of LED fixtures, if the patch is just one digit out, chances are nothing will work properly.

### Cabling and connectors – less copper?

Not everything has to get bigger with an LED rig, however. Most of the professional fixtures have power in and power out! So one power line could feed multiple fixtures. As Martin explained to

the students, when we first started using moving lights in theatre (and elsewhere) they were not very reliable, and it was considered good practice to power each one individually. With some of the larger moving lights, pairing isn't an option anyway, because each one can draw close to 10 amps.

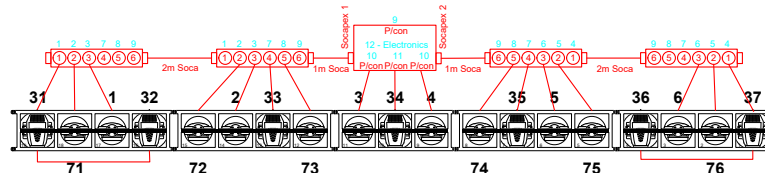
However, lighting technology in general has become more reliable, added to which LED units draw a lot less power than their tungsten or discharge equivalents, so “daisy-chaining” power is definitely an option. The manufacturers all specify the maximum number of fixtures you should link together. Martin Chisnall recommends that you halve this number! His rule of thumb – four static fixtures or two moving

fixtures – but he is also keen to emphasise there is no right or wrong answer, as long as what you do is electrically safe. The decision comes down to a balance between speed and convenience in rigging against what you might lose in the (unlikely) event of failure.

So, while the amount of data cable we will be using in an LED rig will generally increase, there is the potential to reduce the power cable count. This is where Martin's COTPADD comes in. It sits on the truss, powered by a single 32 amp three-phase supply that runs from “Distro World” to the truss with a pair of DMX cables (one active, one spare). The box has twelve circuits on two Socapex connectors, each with a DMX controlled relay (which

Typical Truss Circuited.  
 Demonstrating reasoning for output wiring.  
 (LX #3 shown here)  
 Multicore circuits in RED  
 MCB numbers in ■ DMX  
 MCB 9 provides spare power to every truss section.  
 MCB 12 controls onboard electronics  
 Drawing is schematic only. Do not infer layout of COTPADD from this drawing.  
 Multicore circuits are shown mirror imaged for clarity.

*Wiring schematic of one truss from Mamma Mia!*



# LED changes everything

Nick Moran

provides on/off control and hard reset-ability from the desk) and is electrically protected by an MCB. It also has DMX distribution. The first fixture in each group of two movers or four static fixtures is fed from a single circuit of power with DMX looped through as usual. Subsequent fixtures are linked by custom loomed power and data links. The boxes were made by Howard Eaton Lighting.

As Martin says, "Yes, the individual breakers are on the truss, but frankly, with today's kit, if a fault trips a breaker, it's likely you will need to access the truss anyway to replace a fixture." On *Mamma Mia!*, then, trusses that used to need three or four Socapex multicore cables now only need one power cable. (And that cable is the much more robust HO7 style, also known as TRS, rather than the less resilient multicore cable.) The footprint of "Distro World" has also significantly shrunk.

## **PowerCON and gendered connectors**

If you've played with any of the professional LED fixtures, it won't have escaped your notice they have an interesting low-profile (small) latching power connector from Neutrik: powerCON

(blue or white body at up to 20 amps) or powerCON TRUE1 (black and yellow – a bit like a wasp...).

Let's start with powerCON. This is from the Neutrik website: "Attention: The powerCON is a connector without breaking capacity, i.e. the powerCON should not be connected or disconnected under load or live!" Hence the slightly disconcerting sound you often hear when you do plug or unplug powerCONS live.

There isn't an obvious "male" or "female" with powerCONS, and in any case, terminology is changing. You will increasingly see the designations "source" for a connector that power or signal comes from (old-school socket) and "drain" or "sink" for the connector that power or signal goes into (old-school plug). Neutrik's website says that blue inline connectors are for power out and white inline connectors are for power in. However, blue inline connectors mate with blue chassis connectors and white inlines with white chassis, so when we are talking about which colour of connectors does what on a fixture it's the other way round. On equipment, chassis mount blue is power in, and chassis mount white (if present) is power through!

Since neither powerCON has exposed conductors there is no obvious old-school "plug" or "socket". This means using the "wrong" connector on a cable is less electrically dangerous – you can't create the same kind of danger that a male-to-male 15 amp or 16 amp lead presents with powerCON, for example. However, not following Neutrik's website recommendations could lead to some adaptors from powerCON to 15 or 16 amp connectors becoming dangerous – so please take care.

The other thing to remember with powerCON is that to join two cables you need one of these (right), a Neutrik coupler for linking cables.

This can become an issue when you need to move a fixture in, say, a studio rig. We can take down the fixture and join the DMX cables together, but we will need a coupler to link the power cables.

The powerCON TRUE1 is designed to be connected or disconnected under load, and you can join cables. As the Neutrik website states: "The powerCON



Image from [www.neutrik.co.uk/neutrik/products/powercon/powercon-20-a](http://www.neutrik.co.uk/neutrik/products/powercon/powercon-20-a)

TRUE1 is a locking waterproof 16 A true mains connector. It replaces appliance couplers wherever a very rugged solution in combination with a locking device is needed in order to guarantee a safe power connection." You will find powerCON TRUE1 connectors on some more recent equipment, for example Mac Aura XB. However, as some of you will be aware, there is a risk of cross-connecting live and earth with TRUE1 connectors if you force them together.



You can download the full safety guidance from the Neutrik website: <https://bit.ly/2qX6tU4>

### **Reliability and crewing – fewer, smarter bodies?**

There is an argument that once an LED rig is in place it needs little or no maintenance. Certainly, there will be no burnt out deep blue gels to replace or tungsten lamps to change. The kit doesn't get so hot either, so we can expect fewer failures of electronics and mechanisms. I have heard it said that changing the rig of a touring musical to LED fixtures allows

management to consider dropping a lighting person off the crew. It would be nice to think that instead of that option management used the time gained from less maintenance to give the tech crew a better work-life balance. As Martin says: "One of the drivers for converting *Mamma Mia!* to LED was that the LX crew was consistently missing all their breaks swapping out broken VL2000s between shows. This has now changed.

It's not that LED fixtures never break, but when they do break they have new modes of failure to get used to. But they are massively more reliable."

Installing or touring a fully LED rig certainly demands more planning and documentation than doing the same with a conventional rig. It probably also requires crew who feel at home with data distribution and networks, including fault finding of ethernet based control systems. It definitely requires a higher level of programming skill to get the shows working and to update the cues when the performances evolve. All this should mean higher fees for more technically skilled setup and touring crew. It also means these crew will need to spend time keeping

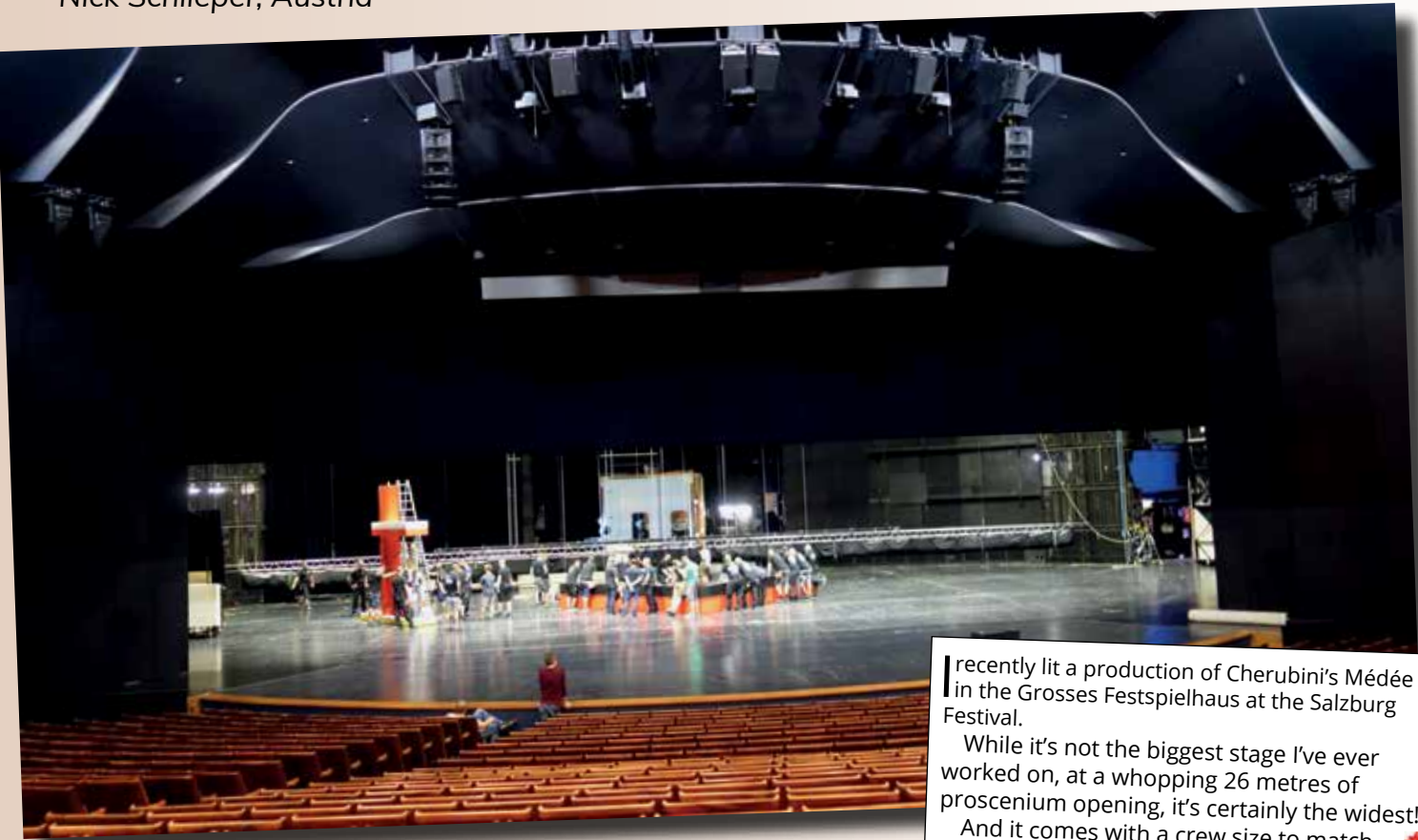
up-to-date with developing technologies and money on increasingly sophisticated tools that we need to troubleshoot what is effectively a large distributed network of lighting computers!

Whether you are an experienced old hand, still formally studying as a student or apprentice, or anywhere in between, we would love to hear your thoughts on developing practice – so please do respond when you have a minute. 🚀



# A postcard from...

Nick Schlieper, Austria



I recently lit a production of Cherubini's *Médée* in the Grosses Festspielhaus at the Salzburg Festival.

While it's not the biggest stage I've ever worked on, at a whopping 26 metres of proscenium opening, it's certainly the widest! And it comes with a crew size to match... 🍷



# Fine-tune your LEDs

There's a reason why lighting designers are turning to our Zircon filters for their LEDs. It's because they've been specifically designed to fine-tune the inconsistencies often associated with LED lighting. And, with options that include warming, cooling, diffusion and correction, they ensure your LEDs give the same performance, time and time again.

Warm • Cool • Diffusion • Correction

**LEE** Filters

[leefilters.com](http://leefilters.com)



# Office Oracle

News and information from **Ian** and the ALD office

It's the end of the calendar year, and so we start to think about the renewals for the next year of membership. Please check the details below as there is quite a shake-up this year as we raise fees for the first time in six years.

## Subscription fee increase in 2020

As advised in previous issues of Focus, in email bulletins and at this year's AGM, the Executive Committee has approved the first increase in subscriptions since 2014.

The five years since the last increase has seen the ALD expand its services and remit, including the new website with improved search functions for all categories of membership whatever their specialism. It is also mobile compatible, and the fees database has now been integrated into it for lighting designer fees with this planned to be expanded to other disciplines later this year.

We also now offer the combined liability insurance for professional and affiliate members which over 150 members now opt in as an addition to their memberships. So far the ALD has subsidised part of the cost to members in order to encourage them to sign up if they feel they will benefit from the cover.

However, costs also increase and, after six years, we need to increase our income in order to run on as close to a balanced budget as possible and not rely on the reserves we hold for day-to-day funding in the longer term.

In some cases the increases have been phased in over a couple of years, and the Executive has decided to then hold these fee levels through until at least 2025. This increase has the potential to also push the ALD's turnover through the VAT threshold. We are currently taking expert advice about whether we would need to charge VAT to membership fees if that happens, but the Exec's current position is that any VAT liability will be taken from the published fees for the individual memberships so as not to increase them again before 2025.

Therefore, the following rates for current members will come into effect as of 1 January 2020:

Category	Current	2020	2021
Professional	£85	£102	£120
Affiliate	£50	£60	£72
Associate	£45	£48	£48
Student	£30	£36	£36
Retired	£30	£36	£36
Corporate	£600	£660	£660
Commercial	£250	£300	£300
Non-profit	£50	£60	£72

NB: The combined liability insurance scheme fee for 2020 will be set once we have received our renewal cost from our insurers in the new year.

## The ALD and direct debits

From the start of 2020 we will be offering members the opportunity to pay by monthly direct debit to help spread the cost and manage cash flow. We have previously offered quarterly payments, but with over 350 members that have taken up the option to automate their payments by direct debit to us over the last few years, we feel confident that we can roll out a

further phase to assist members paying their subscriptions.

Since announcing that we would do this, our partners at GoCardless.com have announced that they are re-structuring their charges which will now see us pay 20p for every transaction in addition to the 1% fee they already charged. This now means that we will be charged £2.40 + 1% of your membership fee for every monthly direct debit that is set up.

The monthly rates will be as follows:

- Professional
  - 2020: £8.50 pcm
  - 2021: £10 pcm
- Affiliate: see below
- Associate: £4 pcm
- Student: £3 pcm
- Retired: £3 pcm

Please note: Due to the admin involved we will discount the Professional 2021 level down to the 2020 rate after the instruction has been set up.

We will let you know how to sign up for the monthly rate in early 2020 before the renewals process starts.

### ***Affiliate membership***

This is an early-career membership category, and we wish to help members starting to earn a living in the industry to develop their career in the first five years. With that in mind, as of January 2020 we will be changing the fee structure for Affiliate members.

Annual subscriptions will now receive a discount depending on which year of Affiliate membership you are in. Hopefully this means that as your career develops, you earn more and contribute more to the Association. The new structure will be:

- Year 1: £48
- Year 2: £60
- Year 3: £72
- Year 4: £84
- Year 5: £84

We hope that this change closes the gap between Affiliate and Professional membership subscriptions and encourages fifth-year Affiliates to continue to Professional membership without having to stretch their pocket too far.

Those who have become Affiliate members after graduation this summer will join the new scheme as their “year one” starts on 1 April 2020. Those who joined

the Affiliate category in 2019 membership will move into year two. Those that have been Affiliate members since 2018 and before will continue to pay a flat rate of £60 in 2020 and then £72 in 2021 as outlined above in the fee increase section.

The Affiliate monthly direct debit will also follow a similar structure as shown above – just divide each annual fee by twelve!

### ***Did you graduate from your course this summer?***

When you join the ALD as a student member, we ask you to inform us of your proposed graduation date so we know when you are due to finish your course.

If that was listed as being the summer of 2019, we will have now changed your membership category to the Affiliate membership for early-career professionals, and with that you will be able to start accessing the same benefits as the Professional members do, with the exception of voting on Association issues.

Your current membership subscription (whether paid or via the Sponsored Student Scheme) will continue to run until the end of March 2020. Prior to this point you will need to have informed us as to

# Office Oracle

Ian Saunders

whether you wish to remain an Affiliate member, move to become an Associate member or to stop your membership completely.

The sooner you do this the sooner we can ensure you are sent a reminder for the correct level of subscription for 2020/21 or, if you have chosen to stop your membership, do not send you a reminder.

Under the Constitution of the ALD, with the exception of the Sponsored Student Scheme, memberships continue to run until such time that you inform us that you wish to leave. No contact will be assumed to mean that you are happy to continue as an Affiliate member and to pay the relevant subscription rate as of April 2020.

## **Company director elections 2020**

Following the incorporation of the ALD in 2016, we are now required to hold annual elections for Directors. ALD Directors are nominated from and elected by Professional, Fellow, Life and Honorary members – the voting membership.

An elected director serves for a three-year term, when they can then stand for a second term. They must stand down for a minimum of one year after the second

term before being able to stand again. Therefore, each year one third of the eleven director spaces are up for renewal, and we are now asking for interested parties to stand for nomination for the 2020 elections.

We are particularly interested to hear from members who have experience of the concert touring world and video/projection design to better represent these areas of our membership.

There is a minimum of three director positions available for election in 2020. All directors that up for re-election are eligible to stand for another term if they wish to. The result of the ballot will be announced at the 2020 AGM. We should have a date for this to announce in the next issue of *Focus*.

For full details about the directors' duties can be found on the members' side of the ALD website at [www.ald.org.uk/director-elections](http://www.ald.org.uk/director-elections). It can also be sent by post upon request if we do not have a registered email address for you.

## **Showlight call for papers**

The Showlight quadrennial lighting conference will take place at Fontainebleau, France from 22 to 25 May, 2021. At the

heart of Showlight is its fascinating programme of papers delivered by lighting practitioners from around the world.

The essence of Showlight is its speakers, and they are now calling for anyone involved in lighting – be they lighting designers, lighting directors, directors of photography, architectural lighting designers or associated crafts like programmers and manufacturers – to submit their ideas for 2021's conference papers in Fontainebleau. Talks are to be twenty minutes in length to enable as many papers as possible to be presented over the three-day period.

Showlight aims for variety, across topics relevant to all aspects of the lighting industry today. They want to hear about your experiences, your ambitions, your inspirations, your concerns, your successes and your failures.

If you would like to become part of Showlight 2021 by presenting a paper, please send the following to [papers@showlight.org](mailto:papers@showlight.org): name(s), company, mobile number, email address, and a brief summary of the paper you are proposing.

All papers will be considered by the Showlight Papers Committee. They look forward to receiving your exciting ideas.

## WhatsOnStage awards

The WhatsOnStage nominations were announced on 5 December. You can see the full list of nominees at [awards.whatsonstage.com/index.php/voting-2/](https://www.whatsonstage.com/index.php/voting-2/). Voting closes on Monday 27 January, and the winners will be announced on Sunday 1 March.

In the Best Lighting Design category, sponsored by White Light, the nominees are (ALD members in bold):

**Jon Clark:** *Evita*

**Ben Cracknell:** *Joseph and the Amazing Technicolor Dreamcoat*

**Howard Hudson:** *& Juliet*

**Hugh Vanstone** and Tim Lutkin: *Present Laughter*

Jessica Hung Han Yun: *Equus*

## Knight of Illumination USA awards

The KOI USA awards ceremony was on 22 November in Las Vegas.

The full list of winners is available at [www.knightofilluminationawards.com](https://www.knightofilluminationawards.com).

Congratulations to ALD member **Bruno Poet** and Richard White, who won the Robert Juliat award for Festival/One-off Lighting for Björk's Cornucopia. 🌸

## Some thoughts on LEDs

Jonathan Dawson-Butterworth

While I enjoy the benefits that some LED fixtures can bring, including colour mixing and colour temperature adjustment, I am increasingly concerned over the output I will get from the fixtures I am supplied with.

Even though some manufacturers take great pains to match their fixtures in the factory, over time different venues, studios and supply companies all use their fixtures differently so one fixture may have had its red LEDs used many hours longer than the others, while another may have had its blue and another colour correction used more. This means it is quite possible that the same model of fixture could be outputting different colours in different locations or between the same package of hire stock and no one will know how this usage will alter the output we see – it may be gradual at first but then one day we suddenly find we are looking at a variety of subtly different colours and not in the way that you get with an old faded filter. Also, what do supply voltage and frequency differences do to the spectral output, especially as fixtures and their power supplies age?

The other problem is with there now being so many different LED fixtures out there it is not the same as tungsten fixtures where you pretty much know what will come out of a tungsten lamp





regardless of the fixture. For examples a 2kW lamp of any brand in a fresnel or a Source 4 from any hire company will pretty much output the same spectrum even when getting older or dusty. However, a 2kW fresnel equivalent or LED profile could be anything similar to tungsten but not actually the same or the same as the next brand or model of fixture you see/use.

This all brings me to the next potential problem... Having already run the gauntlet of potential uneven dimming issues and flicker visible to the eye/on camera, when the client points out things look different or different from the previous time, where would we stand and what could we say/do? Could we potentially be open to a liability claim for something we have no control over?

It would be very hard, but do we need a standard by which we could compare what fixtures will actually output over their life and at any intensity? Could manufacturers produce a graph showing adherence to TCL1 over the full dimming curve?

Is there any possible solution to the different venues/supply companies issue? Will we have to not accept any substitutions of types in order to protect everyone from the risks of ending up with a completely different look from the one intended? 🌸

## Diary dates 2020–2021

- 9 January** Sound on Light Day, ASD Winter Sound School Central School of Speech and Drama followed by social evening
- 24 January** New Technologies Showcase Central School of Speech and Drama followed by social evening
- 17–18 January** Chamsys training  
Fineline Lighting, Bristol 
- 29 January** Stage Electrics showcase  
SS Great Britain, Bristol 
- 30 January** Equity designers ITC agreement meeting  
Guild House, 6–8pm
- 6 February** RobeSpot Controller demo and training event  
St George's Hall, Bradford followed by social evening 
- 24 February** TPI awards
- 1 March** WhatsOnStage awards
- 6 March** Members' visit to Linbury Theatre, Royal Opera House followed by social evening sponsored by Stage Electrics 
- 29 March** Staging Places exhibition at V&A closes
- 12–13 May** PLASA Focus: Leeds\*
- 12 May** Members' social evening, Leeds
- 10–11 June** ABTT Theatre Show\*
- 22–25 May 2021** Showlight, Fontainebleau, France\*
- 5–15 August 2021** World Stage Design, Calgary, Canada

Keep up to date with ALD events via the online diary: [www.ald.org.uk/diary](http://www.ald.org.uk/diary)

\* The ALD will have a presence at these events.

## Contact us

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### Focus Magazine

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However, company members may send press releases to the ALD office ([office@ald.org.uk](mailto:office@ald.org.uk)) to be posted on the News section of the ALD website. Company members only may advertise in *Focus*; please contact the office for details. Editorial guidelines for authors are available on request. *The opinions published within Focus are not necessarily those of the ALD. E&OE. Content deadline for the next issue: 15 January 2020*

# New members

Welcome!

## *Professional members*

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## *Affiliate members*

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George Lawton, Cambs

Daniel Pirie, Aberdeen

## *Associate members*

Jake Jenkins, London

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Graeme Smith, Salisbury

Tristan Tereszczuk, London

Ben Tinniswood, London

Arvid Zollinger, London

\* Re-joining the association

† From Associate/Affiliate member

# Professional members' shows

opening in December and January

From the "Diary" page of the ALD website. A full listing of all members' shows can be seen at [www.ald.org.uk/diary](http://www.ald.org.uk/diary). To be listed, enter show credits into your profile after signing in to the members' area.

## December

**1 Jason Addison** *Humbug! The Hedgehog Who Couldn't Sleep* The Albany, Deptford / **2 Jack D Coleman** *Snow White and the Seven Dwarfs* Swan Theatre Worcester / **2 Tom Smith** *The 25th Annual Putnam County Spelling Bee* BOA Theatre / **4 Palle Palme** *Flashdance The Musical* German Tour / **5 Joshua Gadsby** *The Slightly Annoying Elephant* HOME Manchester / **6 Charlie Morgan Jones** *The Snow Queen* Rose Theatre, Kingston / **6 Matt Ladkin** *Jack & The Beanstalk* Beacon Arts Centre Greenock / **6 Joe Price** *Rapunzel* The Egg, Theatre Royal Bath / **6 Pete Watts** *Snow White* Richmond Theatre / **6 Tom Boucher** *Beauty and the Beast* Eden Court Theatre, Inverness / **9 Callum Macdonald** *Robin Hood – Pantomime* The Camberley Theatre / **9 Jane Lalljee** *Giraffes Can't Dance* Curve Theatre, Leicester, Studio / **11 Jason E Salvin** *Storm Whale* York Theatre Royal Studio / **11 Will Evans** *Sleeping Beauty* Guildford School of Acting / **11 Jacob Gowler** *Aladdin* Sutton Coldfield Town Hall / **11 Joseph Ed Thomas** *Dick Whittington* The Tower Theatre / **13 Joshua Gadsby** *The Tyler Sisters* Hampstead Downstairs / **13 Malcolm Rippeth** *Songs for Nobodies* Geelong PAC, Melbourne Arts Centre & Sydney Opera House / **13 John Rainsforth** *Cinderella: Pantomime* Kettering Lighthouse Theatre / **13 Jason Addison** *Beauty and the Beast* Ferneham Hall, Fareham / **13 Oliver Partridge** (production electrician) *Snow White* Amy White Theatre / **13 Katrin Padel** *The Snow Queen* Trinity Theatre Tunbridge Wells / **14 Matt Ladkin** *Beauty & The Beast* Victoria Theatre Halifax / **14 Matt Ladkin** *Aladdin* Leicester DeMontfort Halls / **14 Helene Smith** *Aladdin – The Pantomime* Bushey & Oxhey Methodist Church / **14 Alex Lewer** *Tom's Midnight Garden* Cheltenham Playhouse / **16 Joseph Ed Thomas** *The Love of The Nightingale* The Tower Theatre

## January

**2 Jack Fenton** *Aladdin the Pantomime* The Abbey Theatre / **8 James C McFetridge** *Rapunzel* Craic Theatre, Coalisland / **13 Tom Smith** (lighting and video designer) *Pippin* BOA Theatre / **21 Garry J Hoare** *The Mousetrap* Poole Lighthouse / **24 Jane Lalljee** *Dr Korczak's Example* Leeds Playhouse / **30 Joe Price** *Ask Me Anything* Live Theatre, Newcastle – Then UK Tour / **30 James C McFetridge** *Under The Hawthorn Three* The Mac, Belfast / **31 Palle Palme** *Oh What a Night Swedish Tour*

# A postcard from...

Garry Hoare, India



**G**reetings from BA35 on the tarmac of Chennai International Airport, India. We have opened Agatha Christie's thriller *The Mousetrap* at the Sir Mutha Venkatasubba Rao hall in Chennai. Featuring a UK cast and directed by Denise Silvey, the show is touring to three venues across India.

I was tasked with lighting a British guest house in winter, while in reality the temperature was between 34 and 40 degrees with 70% humidity – not so good for the cast having to wear winter coats and scarves! To prevent overheating I reduced the number of lights overhead from the UK touring design while keeping the warming look. I was offered some LED pars but felt that I really needed that warm tungsten effect. We programmed the show on an ETC Gio (apparently very rare in India). The rest of the tour will be looked after by tour associate and local lighting designer Pubalan "Bala" Mistry.

It's been a great experience that I would like to repeat. 🍀



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# Carols at King's

Bernie Davis on the history and future of this iconic show

I have been the lighting director for Carols from King's for many years now, and as 2018 marked the centenary of this world-famous event it gave me an excuse to research the background of how it came about. Back in 1918 when the Armistice was announced the Dean of King's College Chapel, Cambridge, decided to hold a service of Nine Lessons and Carols that Christmas Eve as a gift to the City of Cambridge, a service that has been held every year since then. You would know that service better by its radio and television programme title, Carols from King's, which for many viewers around the world announces the real start to the Christmas period.



*Guided tour of the chapel*

## **The chapel**

The building is of perpendicular English Gothic design and when you first walk in the sight of the world's largest fan-vault ceiling takes your breath away. The chapel was commissioned by Henry VI the foundation stone was laid by him in 1446. Work continued despite the War of the Roses, and the roof was finally added between 1512 and 1515. The perpendicular design allows for much larger windows than were previously possible, filling the chapel with natural light. The chapel's beautiful stained glass was finished by 1531.

The building survived Cromwell's dissolution of the monasteries 1536 to

1541 largely thanks to his troops being billeted in the chapel, and being winter they chose not to smash the windows. Despite soldiers and horses living in the chapel it largely survived unscathed, although in one area of wall near the altar you can just make out what appears to be the remains of some graffiti depicting a soldier on horseback, believed to have been drawn by one of the soldiers.

*The Rubens under the east window*



During World War 2 the city was concerned that bombing could have destroyed the windows and so they were removed and stored in the cellars of other Cambridge buildings. Luckily that part of Cambridge escaped the bombing, and the windows were replaced soon after the war ended.

At the east end of the chapel over the altar is the magnificent Adoration of the Magi, painted by Rubens in 1634, and bought in 1959 for a world record sum by



*The Rubens under the east window*

a benefactor who then donated it to the chapel in 1968.

### **The BBC**

King's Chapel not only has its own fascinating history, it has also been the setting for some broadcasting history. Back in 1928 the BBC first broadcast The Festival of Nine Lessons and Carols live on Christmas Eve, making this year the 90th anniversary of the BBC's involvement. A photograph in the Radio Times shows the entrance to King's College looking remarkably different from how it looks today, the current look not enhanced by the TV trucks – necessary as they are. Listeners were able to receive the broadcast on 2LO and 5XX (London and Daventry respectively), with the BBC's first charter only having been granted in 1927. Apart from just one gap in 1930 the service has been heard on BBC Radio every year since then.



BBC Cameraman Don Mackay with Marconi Mk1B from MCR10, 1954

The service was first shown on television in 1954 when MCR10, a Birmingham-based three-camera unit broadcast the festival as part of the Television Continental Exchange. This enterprise for the exchange of programmes, now known as Eurovision, only started in June that year, linking Belgium, Denmark, France, Italy, the Netherlands, Switzerland, the UK and West Germany with one month of experimental exchange of programmes via thousands of miles of newly installed circuits, and optical standards converters joining our 405 lines to the 819 lines, 625 lines and 441 lines used abroad. The press and the public saw this as a great success and despite the high costs involved the exchange was extended to include a Christmas programme by which Carols from King's was broadcast live to nine countries on 23 December 1954, and the BBC took Midnight Mass live from Paris on Christmas Eve, and Winter Sports from Switzerland on Boxing Day.

A film-recorded copy of this broadcast was shown on BBC in 2014 as part of their celebration of sixty years of Carols



OB trucks circa 1954

from King's on television. Although that was the sixtieth anniversary television did not actually cover the event every year, indeed it was 1963 before the BBC visited a second time, and there have been a few gaps since then, including one when the BBC was barred from the chapel following controversy over some damage incurred to the walls. I can't find out exactly what was done or who was to blame, but I have seen scars on the walls over the choir where I was told scaffolders had fitted pipes to mount 2k fresnels used to light the choir.

I have the names of many of the people who have lit King's in the past, although the further I went back the more vague were the memories! I can't find a record of who lit the first broadcast in 1954, but when the BBC returned in 1963 Barry Hill from BBC Birmingham is credited. Barry was a much respected Midlands-based TV lighting director and of course Cambridge came under the Midlands in the old BBC

# Carols at King's

Bernie Davis

regional division of programmes. In 1972 Bryan Wilkes, ex-head of BBC OB lighting was involved, soon followed by Hugh Cartwright, Harry Thomas, Alan Woolford, Peter Greenyer, and Bert Robinson. In 1991 Peter Webb was asked to take on the lighting, and to reassure the chapel that more care would be taken a policy was followed by which continuity of staff year on year was maintained as far as possible. Peter left the BBC in 1999 and handed the show to me, and I have managed to stay with it since then.

So how do you light a building for multicamera coverage of a service that happens in real time, when you want to look in all directions including up to the roof?

The lighting design changes very little year to year although there have been a couple of landmarks in the past. Camera technology advances have brought about key changes, going back to the early 1950s when the Image Orthicon cameras with their improved sensitivity enabled the broadcast to be made at all for the first time. I mentioned earlier that 2k fresnels were used at one point, which is how the transmission would have been achieved in the days of much less-sensitive

monochrome cameras, and even in the 1980s with tubed colour cameras the lighting director changed the lighting design from scaffolding over the choir to the use of scaffold towers. With careful draping it proved surprisingly easy to make the towers invisible to the cameras.

But in the late 80s Peter Webb was asked to improve the design with two aims: to remove the scaffolding, and to make the lighting look more natural and candlelit. He had the benefit of the new more sensitive CCD cameras that were just being bought by the BBC, and so was able to use much smaller fixtures. But he took another approach which resulted in a story that lives in BBC Outside Broadcast history now. The candles that are used extensively throughout the choir were almost bright enough to give satisfactory and very natural lighting of the choir, almost but not quite enough. He found that the candles all sit in candle holders which contained 10w pygmy bulbs used to light the choir's music. This was part of the 1960s installation of electric lighting into the chapel for the first time, a refurbishment that included two Patt 23s hidden behind the altar's electric chandelier and used to light the Rubens painting



Patt 23, one of two still lighting the Rubens

behind the altar. The Patt 23s were still in use in 2018 by the way, although we did have to fix one this year.

Peter had an idea: if a spacer tube could be inserted under the candle holders with a small window the pygmy bulbs could also contribute to the choir lighting from a very natural angle. He invited Dave Yates of BBC OBs mechanical workshops to come up with a design. Dave drove back to Kendal Avenue wondering where he could source some metal tube of the right size, and on arrival noticed that the swing-pole vehicle barrier had yet again been caught by a truck and was lying snapped off to one side of the entrance. He thought it looked remarkably close to the size he needed and measured it. It proved to be perfect, and the aluminium tube was quickly taken to the workshop, sawn into suitable lengths, windows milled into them, and they were sprayed gold. The result was a very natural



*Candle holder adapter*

look on camera with no possibility of unnatural shadows, and these fittings are still carefully stored and used every year. The only improvement

I have made since taking over is the addition of reflectors made from Rosco reflective material, and diffusers on the windows to improve the spread. We also had them powder-coated one year to tidy them up. Peter replaced the 10w bulbs with 15w to get the level up, but these have to be removed after we go as in summer 15w is enough to make the candles droop. So every year King's starts and finishes with the ritual of fitting and removing of the candle tubes and the changing of the bulbs.

For the rest of the lighting Peter placed small fixtures such as birdies and pinspots on the woodwork over the choir and used these to light the congregation, organ pipes, vaulted ceiling, and other architectural details. This was the design I inherited, and it served well for a few years

until health and safety got involved. The only way this design could be rigged was to walk along a wooden ledge about 4.5m high and about half a metre wide, which was also where the lights were placed. Access meant treading carefully between lights, avoiding cables and other obstacles, with no hand rail and nowhere to harness on to. What's worse the ancient woodwork was getting dilapidated, and you had to think twice about making fine adjustments for fear of moving something else. So one year we set about designing a new way of lighting the chapel, but in such a large and open building where do you put the lights, especially when cameras want to look everywhere.

With help from contractors ELP and scaffolders

Bristol and Principality (namely Justin Denchfield and Brian Hamley) I managed to place four vertical trusses, one in each corner of the choir area. At the east end of the choir we fitted chemical bolts into the wall to which we attached short tubes to secure the trusses, and when we are not there a small grey plastic cap leaves the bolt hole almost invisible. The west end of the choir proved more tricky as the oak woodwork prevented us attaching to the wall behind. But with extreme care we



*The adapters in place – you can see the windows letting out the light at the base of each candle*

# Carols at King's

Bernie Davis



*The ceiling lit in sections*

managed to tuck a vertical truss into the corner of the choir stalls themselves, and to secure it with soft ratchet straps to the ancient woodwork. This is not structural enough to allow climbing but is perfectly adequate for keeping the truss upright. A scaffolding T-piece at the top provided a platform for better fixtures than we had used before, such as Source 4 Profiles and 500w ARRI fresnels. The choir is still lit using the adapter sleeves, and the additional lighting is for architecture and the congregation mostly. Source 4 profiles enable the very dark woodwork to be lifted out of the gloom and a few carefully placed fixtures keep the walls visible after the sun goes down. The wonderful ceiling was more of a challenge, and of course it gets heavily featured in the programme. The wide shot from east to west has the whole of the ceiling in it, right over the organ loft up to the west window, so a few lights on our trusses would not do much. The solution I came up with was a small corral of lights placed in the ante chapel some way west of the organ, firing over the loft. From this one point you can see every bit of the roof although the distance varies



*Roof lights at the west end*

enormously as you look for east to west. But by using an array of different fixtures I broke the ceiling down into sections using appropriate lenses to keep levels and spread the same. So each side of the roof uses one 5° Source 4, one 10°, one 26°, one 36°, one 50° and one ARRI 2k Fresnel. It looks more like some lights have been dumped backstage, but they are out of the way and very effective.

To help with the fact that the recording starts in daylight – sometimes with direct sunlight still on the north walls – through into full darkness, we light through the windows from outside with four 4kW MSRs and three 1.2kW pars. This way the light through the windows is maintained to the end of the recording. It might not be natural but it does look nice.

Eight cameras are used: three of them remote pan and tilt heads, three on rolling mounts just west of the choir, one in the organ loft and one hidden near the back of the choir. Careful focusing of the lights



*Truss in the choir stalls*



*Truss west of the choir stalls*



*One of three remote cameras used. The other five are manned.*

and the use of flags keeps the cameras pretty well invisible even though most wide shots would include about half the cameras in frame.

One of the challenges is that we have to record the service as a complete package, and can only do retakes at the end. This means that we might well be recording part of a carol in daylight with a patch recorded after dark. The vision team do great work using their own recording to quickly check how it looked on take one and then match the retake insert as best as they can. There is nothing I can do to help either; it is that large cool daylight lift that disappears.

So what for the future? Well, the lighting works so there is no urgency to fix it. But one project that is already underway is a new house lighting installation. The lights introduced in 1968 have seen their day and the chapel is a gloomy place even with all their lights on – before 1968 there was only candle light. A company is already adding LED lighting that can help with lighting the congregation, and also to light some of the architecture. Thanks to good cooperation the fixtures have already been tested for camera flicker, and they are all colour tuneable. What's more they are DMX controlled so we can drive them ourselves when the installation is complete. I look

forward to seeing what they offer, but I think it might be a while before the candle holder sleeves are redundant. I would like to see that tradition continue well into the future. 🍀



*One Dedo backlight the choir at the altar*

# Alistair Grant

As remembered by *Rob Halliday*

Alistair Grant – "Ali Barrel" to all who knew him, a nickname he enjoyed enough to take as his online address – was a production electrician and lighting designer who was involved with some of the defining shows of the 1980s, 1990s and into the current century.

Born in Dublin and raised in Belfast, Grant came to London at the start of the 1980s to be part of the National Youth Theatre, then studied at LAMDA before joining Theatre Projects.

Those who knew him then remember the calmness, the organisation, the kindness, the quiet Irish lilt, the friendly smile always at the heart of the group, pint of Guinness in hand in the nearest pub after work. All those qualities would stay with him and serve him well during his career.

The 1980s was a time of dramatic change in lighting as new technology created for rock concerts was brought into a series of landmark British musicals.



Photo: Paul Tucker/Charcoalblue

Grant was involved with many of those shows, in particular striking up a strong working relationship with the designer Andrew Bridge on *Time* that would later see him as the production electrician delivering Bridge's

intricate lighting rig for *Sunset Boulevard* in 1993. Bridge remembers a colleague who was "calm, dedicated, knowledgeable, optimistic and persistent, with a talent for getting the best out of designers and crews".

After working on other shows in the same role, including productions of *The Phantom of the Opera*, *Les Misérables*, *Miss Saigon* and the 1999 debut of *Mamma Mia!*, Grant decided it was time to create his own lighting, his designs including *Jailhouse Rock* and *Romance Romance* in the West End among many others.

With a family to support, he balanced this by serving as lighting consultant to theatres ranging from the Gielgud to Chickenshed, and as an associate lighting designer, particularly on shows arriving from New York, including *Sister Act*, *Wicked*,



When the fire alarm went off at a Lighting Lunch, Ali had the foresight to bring a bottle outside with him!  
Photo by Nick Moran

*Jersey Boys* and *The Lion King*, enjoying being part of that show's 20th anniversary celebrations just a few weeks ago.

In recent years he discovered he had motor neurone disease. While this made getting to and working in theatres harder, he was willingly and unhesitatingly supported by family, friends, colleagues and producers as he continued to enjoy work and life.

Alistair Grant was born on May 13, 1963 and died peacefully at home on November 4, aged 56. He is survived by his wife Katrina, whom he met while working on *Time*, and two sons. 🌸

*This article originally appeared in The Stage: [www.thestage.co.uk/features/obituaries/2019/obituary-alistair-grant-lighting-designer-who-worked-on-some-of-the-defining-shows-of-the-last-40-years/](http://www.thestage.co.uk/features/obituaries/2019/obituary-alistair-grant-lighting-designer-who-worked-on-some-of-the-defining-shows-of-the-last-40-years/)*

*Motown the Musical*  
West End and UK tour  
Director: Charles Randolph-Wright  
Set designer: David Korins  
Costume designer: Emilio Sosa  
Lighting designer: Natasha Katz  
UK associate lighting designer: Alistair Grant  
Photographer: Tristram Kenton



# Chris Ellis

James Laws remembers

Chris, ALD member #77, was in the Association from the start, as befitted a member of the previous Society of British Theatre Lighting Designers.

The SBTLD members' directory for 1973 shows that he started his professional lighting career at the Everyman Theatre, Cheltenham, where he lit *Bell Book and Candle*; like many of us in 1969 he was uncredited. However, there were compensations; he met his wife and lifelong partner Gina. After the Little Theatre, Bromley in 1970, Chris moved to Hull Arts Centre and thence to the Phoenix Theatre Leicester, which was a small "temporary" theatre and arts centre, pending the building of the Haymarket Theatre in the city centre.

His freelance career started with *Lloyd George Knew My Father* for Ray Cooney Productions at the Savoy Theatre in 1972. Chris was the resident lighting designer at the Leicester Haymarket when it opened in 1973 with *The Recruiting Officer*.

In tandem with running the lighting department at the Haymarket, Chris built up a steadily growing portfolio of freelance



lighting commissions, among which were *The Winter's Tale* for the RSC in 1981 and *Donnerstag Aus Licht* for the ROH in 1985.

In commercial theatre he showed his range with musicals: *Hair*, at the Old Vic in 1993, and *Me and My Girl*, which transferred from Leicester to the London Adelphi in 1985. He went international with *Me and my Girl*,

opening on Broadway in August 1986. Other international musicals included *Pinocchio* in Milan in 2003 and *Forbidden City* in Singapore in 2002.

He founded Chris Ellis Lighting in 1997, widening his work to include architectural lighting, particularly churches. He was diocesan lighting advisor to Leicester DAC from 1997 to 2009, installing permanent new lighting in eleven churches. He also lit exhibition spaces, notably Derby Museum Enlightenment Gallery in 2013.

When the new Curve Theatre opened in Leicester in 2008, Chris specified the lighting, as he had done for the Haymarket in 1973.

After 2013 with the Chester Mystery Plays, which featured his trademark high backlight beams, Chris eased into retirement in Cornwall. But his final show was in 2016 at the Savonlinna Opera Festival in Finland recreating his design for Janacek's *From the House of the Dead*, which he first lit for WNO in 1982, and a subsequent recreation in Palermo in 2008.

He battled the cancer he had for almost three years and was convinced that he was going to go on and on, ever the eternal optimist.

Chris Ellis made great contributions to the running of the ALD in the early days. I remember taking his call in the small hours during the great hurricane in 1987. He was due to give an ALD talk in London and it was from Chris that I learned that the problem was more than a few trees in Suffolk and our journeys would not be possible.

Chris will be so missed by his family and friends and the wider community. He raised London managements' recognition of provincial lighting designers in the 1970s and his multi-faceted career reflects the freedom that we all discovered back then and many enjoy to this day. 🍷

*Benzin*  
*Chemnitz Oper*  
*Musical director: Frank Beermann*  
*Production: Martin Duncan*  
*Set and costume designer: Francis O'Connor*  
*Lighting designer: Chris Ellis*



# Equity update

Equity designer rep **Robbie Butler** with a year-end update

## **Designer UKTheatre and SOLT claims**

Equity, the ALD and the SBTDA have been working tirelessly to improve the fees and conditions for designers working under UK Theatre and SOLT terms.

Our research began over two years ago where we investigated what needed to change and where the main areas of concern were. The epitome of this was the Value of Design event which took place at the National Theatre in April 2018. From there, the information was collated, and in October 2018 we submitted a comprehensive claim to UK Theatre and SOLT seeking to overhaul the existing national collective agreements. Equity requested a complete reworking of the ways in which our fees were calculated, taking into account the design concept, implementation and use. We claimed a small uplift on the current fees but also for the introduction of a day-rate system for attendance during tech on a sliding scale of £350 per day in a grade 1 West End theatre down to £150 per day in a grade 3 subsidised theatre, with £125 per day as an exceptional minimum.

We also sought to clarify and strengthen existing clauses, including the

responsibility of the managers to cover expenses, with particular emphasis on the absorption of model box materials and the engagement of assistants for their construction.

In the time following the submission of Equity's claim, UK Theatre and SOLT polled their members for feedback. After they had enough responses, representatives of the union and the managers sat down at the table in late May 2019, a full seven months after the initial claim was submitted. Equity was represented by its industrial organisers as well as four members: two lighting designers and two set/costume designers. UKTheatre and SOLT failed to bring any of their members to the table.

The financial elements to our claim were rejected; however, some of the non-financial elements were agreed, including the clauses regarding model box and assistant expenses. Equity sought to restate our case in person with some of their members present. However, UKTheatre and SOLT did not think that was going to be feasible at short notice and to date the May 2019 meeting remains the only sit-down negotiation between union members and representatives of the managers.

We are now over a year on from when we first submitted our claim. We are at a point where our intention is to agree to the terms which UKTheatre and SOLT have offered with a view to submitting a new claim in October 2020 heavily focusing on fees. That will give us just under a year to educate producers about our responsibilities as designers but also to collate further information regarding what is actually being asked of us.

To that end, we need your help! We are asking all designers to start keeping a log of your hours per production including time spent on concept, admin and emailing, rehearsal attendance, plan drawing, pre-vis, tech and everything in between! This information will help make our case to the producers that the minimum fees are not high enough.

We would also like all our designer members to start speaking with managers who contract you about this. Talk to them and try to encourage them to engage with the process. Equity isn't trying to increase the "going rate" (yet); we're trying to bring the minimum floor up in line with it.

We could really do with some producers on our side to be our champions and to help spread the word out among their networks.

We have an exciting year ahead of us where we have a real opportunity to create positive change within our industry.

## ***ITC agreement***

There are to be two working parties formed to begin the renegotiation and redrafting of the ITC contracts, one for directors and another for designers. A designer meeting will take place on 30 January at 6pm at Guild House, Covent Garden. An Eventbrite link will be circulated so please RSVP to that if you wish to attend.

## ***Fringe agreement***

Equity, the ALD, the SBTd and Stage Directors UK have been working together to investigate what a Fringe agreement for creative team members would look like. So far we have held two open meetings, one in London and one in Edinburgh, where directors and designers at all stages of their careers came together to identify where their areas of concern lie. We had planned for third meeting in Wales on 27 November but due to low turnout we cancelled the event in advance. There is expected to be one further meeting to be held in Manchester at a date yet to be announced so keep an eye on the social media platforms of the union and the association.

## ***Overhaul of mental health services***

Equity has announced a major improvement in the services it offers to members in the areas of mental health, bullying and harassment. It will be providing a new dedicated 24/7 mental health helpline, a one-hour individual assessment,

and up to six professional counselling sessions funded by the union available across the UK. Furthermore, they will create an in-house help desk that will provide members with the help they want quickly and efficiently regarding all the aspects of the union's services including mental health and wellbeing, bullying, harassment, insurance and legal services. The Bullying & Harassment helpline number of 020 7670 0268 will remain. The new service will be available in January 2020 and further details will be released soon.

## ***Why join?***

There are many benefits to union membership; however, most of them are not something you might encounter in your day to day working life. Indeed, in an ideal world you'd never need to call on the services of your union. I'm a member for a few reasons:


















- Full legal protection in the event of a dispute.
- Insurances as standard including personal accident as well as PLI.
- The ability to collectively bargain for our minimum terms.
- Political lobbying: Campaigning for the implementation of the EU Copyright Directive into UK law as well as alerting international sister unions to the ALD's Save Stage Lighting campaign – not to mention representing their members with other issues, such as challenging the middle income floor in Universal Credit at the high court.
- The pension scheme that was developed in association with the union, specifically designed for those with turbulent incomes.

The minimum terms of engagement for designers are not good enough. I know that, you know that and Equity knows that. If we thought they were good enough we wouldn't renegotiate them, but we don't get to just dictate what minimum terms should be – the employers have to agree too. Therefore, the Equity minimums are simply the highest number that we can get the employment bodies to agree to.

With turbulent political times ahead, unions may be the last line of defence between severe arts cuts and degradation of our working conditions. However, the union is not something that should be taken as a given. There is no constitutional right to a union, to its service, or to its collective agreements. They only exist because of the demand of the workforce itself. If that workforce decides it's no longer willing to support its union, then that last line of defence crumbles.

It's not right that a handful of people are making their contributions to allow the union to continue to work for us while the rest benefit from the result. Most of the rights normal employees enjoy, such as sick pay, holiday pay, leave, etc., were all won by the unions. We too want these things for our members, starting with a five-day week. Joining the union ensures that the fight can continue, and it means that you are part of that process. Strength in unity protects you as an individual and all of us as a collective. Join your union today: [www.equity.org.uk/about/join](http://www.equity.org.uk/about/join). 🍀

# Commercial members

<p>10 Out of 10 Productions 020 8659 2558 <a href="http://www.10outof10.co.uk">www.10outof10.co.uk</a></p> 	<p>Drafty <a href="http://www.drafty-app.com">www.drafty-app.com</a></p> 	<p>Illuminate Design 01223 969694 <a href="http://www.illuminatedesign.co.uk">www.illuminatedesign.co.uk</a></p> 	<p>Zeal Events 01256 359264 <a href="http://www.zeallive.com">www.zeallive.com</a></p> 
<p>ADB +39 035 654 311 <a href="http://www.adblighting.com">www.adblighting.com</a></p> 	<p>The Fifth Estate 01273 660 784 <a href="http://www.thefifthestate.co.uk">www.thefifthestate.co.uk</a></p> 	<p>Lamp &amp; Pencil 01279 902819 <a href="http://www.lampandpencil.com">www.lampandpencil.com</a></p> 	
<p>Artifice Industries Ltd <a href="http://www.artificers.co.uk">www.artificers.co.uk</a></p> 	<p>Entendi 020 3598 3131 <a href="http://www.entendi.com">www.entendi.com</a></p> 	<p>Panalux 020 8832 4800 <a href="http://www.panalux.biz">www.panalux.biz</a></p> 	
<p>Chroma-Q 01494 446000 <a href="http://www.chroma-q.com">www.chroma-q.com</a></p> 	<p>Fineline Lighting 01275 871800 <a href="http://www.finelineighting.com">www.finelineighting.com</a></p> 	<p>SLX 03300 161 300 <a href="http://www.slx.co.uk">www.slx.co.uk</a></p> 	
<p>Collaborative Creations 020 3743 2691 <a href="http://www.collaborativecreations.co.uk">www.collaborativecreations.co.uk</a></p> 	<p>Goboplus/ Cut Colour Plus 020 3603 1335 <a href="http://www.goboplus.com">www.goboplus.com</a> <a href="http://www.cutcolourplus.com">www.cutcolourplus.com</a></p>  	<p>TLSPixelite 01603 295 111 <a href="http://www.tlspixelite.co.uk">www.tlspixelite.co.uk</a></p> 	

**Thank you for your support!** For Corporate members, see page 30.