Invasion of the Moving Lights

By: Mike Wood

Automated units are taking over theatre rigs. What took so long?

I visited London in April and saw a couple of shows in the West End. One was *Player Kings*, a version of Shakespeare's *Henry IV Parts I and II* with Sir Ian McKellen playing Falstaff. Sir Ian was incredible. I try not to pay too much attention to the lighting when I see shows, but it's too ingrained in me not to take a glance. What I saw surprised me: not a single static light; everything in sight, at least from the audience, was a moving light. All Martin MAC Encore Performances.

I also didn't notice the units moving overtly, either; as far as I could tell, they were being used as repositionable static lights. (The lighting designer, Lee Curran, has since informed me that there are a few static lights on stage, but very few, and that the lights sometimes move when on, but very subtly.) This production was as straightforward a drama as you can get, Shakespeare at his finest, so there were no flashy lighting effects or big musical numbers. Moving lights were used to light the actors, just as static lights would have been.

That got me thinking. Why hasn't this happened sooner? I've often thought that the theatre would switch to 100% moving lights, but it has never happened—until now. Back in the day, we all thought it would happen soon after Vari-Lite appeared — but it didn't. When High End Systems and other manufacturers came along—but no. When moving lights became ubiquitous in concert touring—but it didn't. What finally changed?

How long have moving lights been in common use in theatres and concerts? It's getting close to 40 years. Although earlier products existed, the launch of Vari-Lite in 1981 brought them into the mainstream. Before then, the occasional automated light was a custom product built for a particular use or as a special effect. Even then (although the Vari-Lite pioneers may disagree with me) those first products weren't envisaged as a replacement for lighting on dramas and straight theatrical shows. For the first few years, they were used primarily to create energy on rock-and-roll tours. Some repositionable lights, such as Rank Strand PALS, had been made for TV studios but they had limited success and were extremely expensive.

The success of Vari-Lite (and its closed proprietary system) inevitably attracted competition. Some of it was direct, such as the products from Morpheus/PanCommand. and some of it was indirect with the introduction in the mid-1980s of moving-mirror products such as the PanCan and Coemar Robot, quickly followed by Claypaky Golden Scan and High End System's Intellabeam. Although these made great inroads in concert touring and nightclubs, they were too noisy for theatres.

However, some moving heads did get used in theatrical productions. I remember sixteen VL2s on the West End musical *Time* in 1986 (lit by Andrew Bridge), and nineteen VL2s and VL4s on *Miss Saigon* in 1989, (lit by David Hersey). *Time* was a special effects-driven rock-and-roll musical, so the fixture choice was clear. *Miss Saigon* is also a musical, of course, but is drama-driven, requiring more conventional lighting in addition to effects. David Hersey was a pioneer in mixing the two but moving lights were so expensive at the time that he used modified curtain tracks around the proscenium to allow four VL2s to move. This was apparently cheaper than renting more Vari-Lites! Moving lights were still the exception rather than the rule.

Ten years later, in 1996, I was personally involved in another product launch that I thought would trigger a change in theatrical lighting. That was the introduction of High End Systems' Studio Color, followed by Studio Spot. I thought they would succeed in theatre because they had no fans and were silent. However, I was wrong again; although Studio Colors (and the Martin MAC 500 which came out in 1997) made some inroads into theatre, it was still primarily on musicals and as special effects.

Over the last 25 years, we've seen many new moving lights, each one better than its predecessors. Light sources and color control improved features such as framing shutters were added specifically for theatrical use. Still, static lights reigned supreme with Broadway and West End productions using hundreds of Lekos and ETC Source Fours. For example, the original lighting on *The Lion King* (1997) had over 600 ETC Source Fours with 150 scrollers and around 80 moving lights.

So, what has changed? I think several factors, driven by the move to LEDs, created a perfect storm, suddenly making moving lights a viable,

All photos: Manuel Harlam

even compelling, design choice. I also believe that this trend will accelerate. The move to LEDs enabled this shift in an unanticipated way. Isn't that the definition of disruptive technology?

First, and most obviously, the cost differential between static lights and moving lights has narrowed. Twenty years ago, a moving light might cost $5,000 while an ellipsoidal was only $250. That's a twenty-to-one ratio. In 2024, that price differential is more like four to one or less. That's largely because the cost of an LED-based additive color-changing static light has risen significantly while moving lights have become cheaper after accounting for inflation. Yes, the LED static light does much more than its predecessor, but you pay for those features. Now the lighting designer only has to decide if one moving light can do the job of four static lights instead of having to replace 20 in the budget.

Second, the quality of the output in moving lights has improved with the move to LEDs. The light from most discharge lamps was, frankly, horrible, marked by high color temperature and poor color rendering. It was fine for colors and special effects but, no matter what the salesman may have told you, it was less than ideal for lighting human skin tones or costumes in a naturalistic manner. Watching a musical, it always jarred when the musical number was about to begin because the actors' faces went from appearing human to getting that desaturated, I'm-in-a-followspot look and all the color disappeared from their costumes. To make matters worse, the lamps didn't match from unit to unit. A new discharge lamp could vary from magenta to green, changing color as it aged. Yes, I'm being a little cruel; not all discharge lamps were as bad, but they weren't great either. A Source Four, or any incandescent fixture, was perfect on human skin and discharge lamps couldn't compete. To be fair, early LED luminaires weren't much better than the discharge lamps they replaced, but they have improved very quickly, and today you have a range of LED-sourced moving lights with excellent, consistent, color rendering available from many manufacturers. These lights are perfectly acceptable for lighting skin tones in a drama. (I still hate that most currently available products employ subtractive color mixing with dichroic filters. But I'm confident this is just a phase we are going through, and we'll mature into grown-up additive mixing before too long.)

Now for an obvious difference: When an LED moving light is off, it's really off. A discharge lamp unit would still be running inside the lamp house behind a blackout shutter. From the half to the end of the show, they burned, with hot energy sinks draining power and cooking the stage. It's not just the wasted energy, it's the need to replace burned-out lamps, the effect of heat on long-term component relia-

Scenes from *Player Kings*, with lighting by Lee Curran, using an almost entirely automated rig.

bility, and the continuous noise from fans. (Note: With a few exceptions I don't think most theatres care that much about the energy consumed by their stage lighting. Even with discharge lamps, it's usually a tiny part of the overall energy budget for the building.) LED-based units don't consume much less power than discharge lamps, but that power is only used when the lights are on in a cue. Many also have options to reduce fan speed or turn them off completely.

Partly because of their reduced heat loads—but mostly because we have just gotten better at making them—moving lights today are much more reliable than 20 years ago. This means rental rates are a bit lower, which goes to my first point above: cost of ownership. Framing shutters used to jam, irises would get sticky, units would need to be regularly repaired. These things still happen, but much less frequently. Gone are the days of needing a full-time moving light hospital on every show. And remember: No lamp replacements are needed.

When I asked Lee Curran, the lighting designer for *Player Kings*, why he chose a predominantly moving light rig, his answers echoed mine regarding cost. He had other thoughts on the technology improvements he has noticed with LED units. "Better tech—for example, brighter output in an acceptably small footprint (so they're usable in smaller theatres—think Donmar [Warehouse] or Almeida-type producing houses), better colors (especially the CTOs and CTBs that are used more on plays), less noise, and better fading (especially the low end). Even things like proper ('heavy') diffusion make them more usable in a theatre environment."

One point Lee made, which I hadn't thought of, is that those in charge of productions are comfortable with the technology: "We've reached the point where they've become common enough to propagate their own use. By which I mean directors, designers, and producers have either used them or seen them in use elsewhere, so they accept that they're not just for flashy stuff such as musicals and gigs, but 'proper' tools for plays as well; they have an understanding about the flexibility they afford you—that they're not an extravagance." He added, "Personally, I'm not sure we'll ever get to a point of entirely moving light rigs. I think there will always be uses for LED profiles, strobes, and battens, even if it comes down to cost. But we're definitely a lot closer than we've ever been."

Another factor is becoming increasingly important: access to lighting once it's in the rig. How do you get to a luminaire for focusing? Forty years ago, we would put up an A-ladder or some kind of access equipment like a Genie or Tallescope to get to fixtures above the stage. With increasing health and safety legislation in most countries, this type of equipment is frowned upon. It's difficult in a professional theatre and almost impossible in a school or college. Some venues are laxer than others, of course, but they all require safer access to rigs, and thus, unfortunately, less convenient access. Moving lights that don't require manual focusing clearly help. Another example of this was the 2015 Detroit Auto Show. It was so difficult (and expensive) to access the lights to focus them once the cars were positioned that the designers at Lightswitch asked PRG to design and build a custom repositionable luminaire, the AutoPar, just for that show. Most of them were focused during programming and never moved for the remainder of the show. That was nine years ago and safe access certainly hasn't got any easier.

Where does this leave us? Moving lights with LED sources have reached an acceptable level of quality for skin tones in dramas, they solve many problems, and their relative cost has come down. This provides the long-anticipated path for them to become the norm rather than the exception. I see Broadway and West End shows from new designers where the vast majority of units over the stage are automated, with perhaps only some specials and long-throw front-of-house that are static. It's not only Broadway. I've noticed it in small local theatres here in Austin, Texas. When they have money to replace old incandescent Lekos, Altmans, and Source Fours, what do they buy? A handful of inexpensive LED moving lights. This has changed even from where it was a few years ago when they would have bought some static "pancake" LED PARs.

The floodgates we thought were starting to leak in 1981 have finally opened, and they're not going to close again.