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Elation Platinum Spot 5R

By Mike Wood

One of the positive by-products of the irresistible rise of LEDs in our industry has been the innovation and improvements they, and the corresponding striving for improved efficacy, have stimulated in the development of other light sources. Plasma lamps, OLEDs, and even our old friend the incandescent, are all making great strides forward. In this review, we are looking at the first fixture I've tested that uses the MSD Platinum series of ultra-short arc lamps from Philips. It is the Platinum Spot 5R from Elation. Elation is prolific at introducing new fixtures, and it's particularly interesting to see it be among the first to use this new lamp style. The ultra-short arc of the MSD Platinum series should be perfect for a spot fixture, enabling the luminaire manufacturer to use a correspondingly small aperture and optics. Elation has taken advantage of this to produce a very small, but quite powerful, unit.

This review follows my usual format, in which we start with that MSD Platinum lamp and follow through the optical train, ending with the light output. As we go through, I measure everything I can think of objectively as possible, to give you the necessary data to evaluate the unit for yourself. The data comes from tests I carried out on a single unit supplied to me as typical by Elation. Elation reports that I had a late model pre-production unit; very few changes were made from this to the shipping product. My tests were run on a nominal 115V 60Hz supply; however, the Platinum Spot 5R will run on voltages from 120-240V 50/60Hz. In my tests, it consumed 2.85A on 118V for 336W of power. Total input power was 339VA at a 0.98 power factor (Figure 1).

Lamp

As already mentioned, the unit uses the new Philips MSD Platinum 5R lamp (Figure 2). It has a very small 1mm arc gap inside an unjacketed arc tube; the whole burner assembly is supplied pre-aligned in a glass dichroic-coated ellipsoidal reflector. The small arc gap and pre-aligned reflector mean that the optics can be both small and efficient; in fact, the Platinum Spot 5R's gate size is only around 0.5" in diameter. It's ironic that this style of lamp is being used, as this is where it all started over 25 years ago. Many of the earliest moving lights, such as the Vari*Lite VL1 and the Coemar Robot, used arc lamps like the GE MARC-350, with pre-focused reflectors that had been designed for use in 16mm movie projectors. In more recent times, we've seen pre-focused arc lamps used extensively in video projectors, but, until now, partly for engineering reasons but primarily for marketing concerns, none of them had made it into automated lights. I'm delighted to see it happen, as a pre-focused lamp solves a lot of problems for the luminaire designer. A badly aligned lamp or an old dirty reflector can easily throw away half the light output of the luminaire. Elation is using the lamp as a package from Philips, which includes the lamp power supply and igniter. The MSD Platinum 5R lamp is rated at a nominal 160W, with an actual power draw of 189W. That

Figure 01 - Fixture as tested

Figure 02 - Lamp

Figure 03 - Lamp change

Figure 04 - Dimmer and aperture

Figure 05 - Lamp house

doesn't sound that much, but the 1mm arc and integral reflector mean that a lot more of the light output should be usable than from a lamp with a larger arc. The lamp's lumen rating is 7,950; we'll see later in the review how much of that makes it out the front of the fixture.

At the moment, changing the lamp is a little tricky: Remove the rear panel, and you see the lamp and its connections (Figure 3). You then need to remove a couple more small screws to extract the lamp. Elation tells me that this is being improved in the production unit, simplifying the lamp change. Hopefully, it won't be a problem you get too often, as the lamp is currently rated for 2,000 hours life. Once the lamp is removed, you get a good view of the dimmer and primary aperture (Figure 4). Next in line is an angled hot mirror, which also seals off the exit of the lamp house for cooling. The penalty for using an unjacketed lamp like this is that you, as the luminaire designer, become responsible for its correct cooling. A jacketed lamp is much more forgiving, as the lamp designer has taken care of a lot of the issue with the jacket design. Elation uses a sealed lamp house with two fans directing air through ducts at specific points on the lamp and reflector (Figure 5).

Dimmer and strobe

Next in line is the dimmer/strobe assembly. This consists of a pair of toothed flags that close in a scissor action across the beam. The dimming was reasonably smooth, particularly at the top end, but exhibited some artifacts when dimmed below 30%. The dimming curve itself (Figure 6) is a very steep S-curve shape with little control at the very top and bottom, and everything happening fairly linearly between 30% and 75%. It's not my favorite curve to try and match to other fixtures, but it's usable. The strobe is very effective, with selectable speeds from 1.65Hz to 11Hz. After the dimmer, the light is homogenized before entering the gobo wheels.

Gobos

The Elation Platinum Spot 5R has two gobo wheels: a static wheel with 14 non-changeable patterns plus open hole, followed by a rotating wheel with eight interchangeable patterns plus open. Figure 7 shows the arrangement with the two gobo wheels mounted back-to-back as close to each other as possible. The rotating gobos are mounted in individual removable carriers, complete with their associated planetary gears, and are very easy to exchange. Figure 8 shows one being removed. The first surprise when you take them out is how small the gobos are. Figure 9 shows two of the rotating gobo carriers, along with a normal pencil for scale. Each gobo has an image diameter of only 8mm within a 14mm carrier aperture! Fortunately, current techniques for producing high-resolution gobos through either fine pitch photo-lithography or laser ablation can produce excellent products in these small sizes, and the level of detail was good.

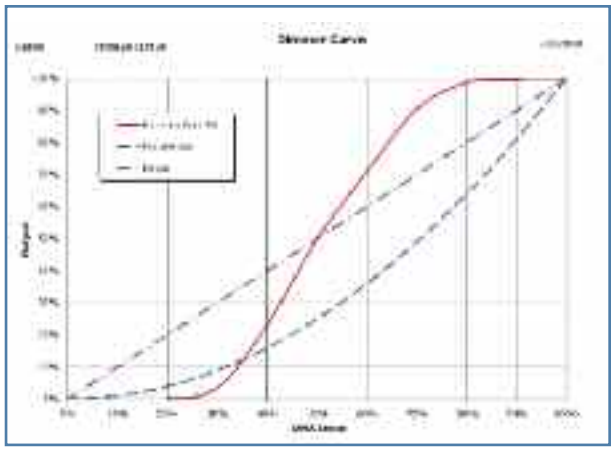

Figure 06 - Dimmer profile

ROTATING GOBO	
Gobo change time, adjacent apertures	0.2 sec
Gobo change time, max (Gobo 0 to 4)	0.7 sec
Maximum gobo rotate speed	0.54 sec/rev = 110 rpm
Minimum gobo rotate speed	139 sec/rev =0.43 rpm
Maximum wheel spin speed	2.23 sec/rev = 27 rpm
Minimum wheel spin speed	83 sec/rev = 0.7 rpm

Both positioning accuracy and rotation smoothness of the gobos was excellent, with no evidence of judder or jumping. I measured hysteresis at around 0.33° of error, which equates to about 1.4'' at a 20' throw. That's not the best we've seen in absolute terms, but is really pretty good for such a small gobo. My only issue with the gobo size was when doing a slow wheel rotate—the gaps between gobos are much larger than the gobos themselves, so you get a dark patch in between the gobos.

Figure 07 - Gobo and colors

Figure 08 - Gobo change

Figure 09 - Gobos

Figure 10 - Gobo morph sequence

Figure 11 - Half colors

Figure 12 - Optical train

STATIC GOBO WHEEL	
Gobo change time – adjacent apertures	0.2 sec
Gobo change time – max (Gobo 0 - 7)	0.6 sec
Maximum wheel spin speed	3.73 sec/rev = 16 rpm
Minimum wheel spin speed	140 sec/rev = 0.4 rpm

Focus quality on both wheels was good, with just a little visible spherical aberration. However, the depth of field of the very fast optical system is so short that any warping or misalignment of a gobo quickly shows up as an out-of-focus area on the image. On the other hand, that depth of field does give you some very nice gobo morphing between the two wheels. Figure 10 shows an example of what can be achieved by pulling focus.

Iris

The iris is squeezed in between the rotating gobo wheel and the color wheel. Even so, it's too far away, from a focus point of view, to be able to iris in on gobos.

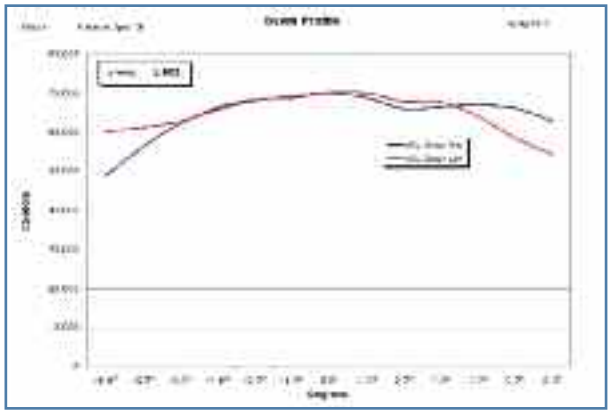

Figure 13 - Spot beam profile

However, you can get some interesting effects by pulling focus to the iris and then opening it right out—perversely, you get an out-of-focus beam that's larger than normal, rather than smaller. In "normal" sharp-focused iris mode, it reduces the beam size to 29% of the full size, so that the beam with minimum iris is 4.7°. Iris movement was smooth, and moves from open to closed in around 0.6 seconds.

Fixed color wheel

Figure 7 also shows the color wheel. The Elation Platinum Spot 5R has eight permanently attached trapezoidal dichroic colors ranging from saturated colors to CTO and CTB color correction.

FIXED COLOR WHEEL								
Color	**Red**	**Blue**	**Green**	**Yellow**	**Magenta**	**UV**	**CTB**	**CTO**
Transmission	6.5%	34%	11%	69%	20%	2%	51%	44%

Some of the colors, such as the red and green, are extremely saturated, and cut light output significantly. Perhaps that suits the intended audience for this fixture? I measured the uncorrected correlated color temperature (CCT) of the Platinum Spot R5 as 6,670K; CTO took it down to 3,800K while CTB was too far off the black body line to measure.

Half colors are interesting; the extremely short depth of focus means that you get some notable transitions between colors. It's not a sharp cut between them, but instead a gradual change. Figure 11 shows an example.

COLOR WHEEL	
Color change speed – adjacent	0.1 sec
Color change speed – worst case	0.3 sec
Maximum wheel spin speed	0.55 sec/rev = 109 rpm
Minimum wheel spin speed	140 sec/rev = 0.43 rpm

Wheel rotation and color selection was very smooth, with no visible jumps or jerks in slow rotations. This was true of all motor movements in the Platinum Spot 5R; Elation has done a good job with keeping everything smooth.

Lenses and output

The Platinum Spot 5R has two lens groups: a moving group between the color wheel and the prism providing focus adjustment, and a fixed output lens at the front of the unit. Figure 12 gives an overview of the whole optical train. Image quality from this was excellent, given how small everything is. The measured output from the Platinum Spot5R was 3,800 lumens, with a field angle of 16°, which gives it a very good overall optical efficiency.

Figure 14 - Prism

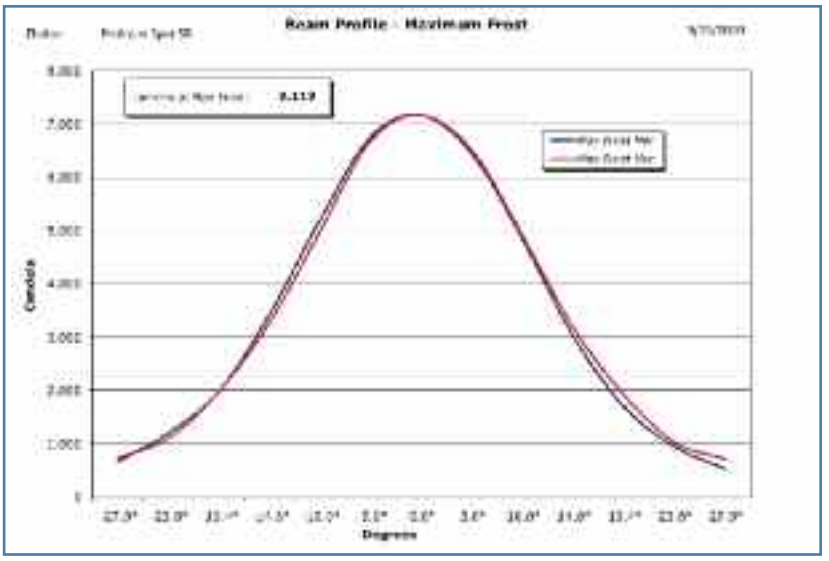

Figure 15 - Frosted beam profile

However, for me, the most noticeable thing about the beam from this product is just how flat it is—better than 1.4 : 1 center-to-edge ratio. That makes it an excellent fixture for gobo projection. You can see this very clearly in Figure 13, which shows the output profile without the frost filter in place. The lamp and optics are very similar to a video projector, so it shouldn't be surprising that the field is, too.

The time to take focus from one extreme to the other was 0.9 seconds. I found that the programming of focus was a little tricky, as the movement lagged control slightly, and the depth of field is so short. The result was that I kept overshooting when trying to dial it in.

Prism and frost

The rotating three-facet prism and frost flags are mounted between the focus lens and the final output lens. The prism works well, with good image separation, and produces some good effects in conjunction with the rotating gobo wheel. It takes 0.7 seconds to insert or remove the prism from the optical train, and it can be rotated at speeds varying from 0.35 seconds/rev (171rpm) down to 168 seconds/rev (0.36rpm) (Figure 14).

Last in the chain are the frost flags, which take the beam all the way out to a smooth beam at a 56° field angle with a blending profile. Figure 15 shows the field and the 2,112-lumen output that I measured. Elation advertises this as a hybrid wash light function. I'm not sure I fully agree, as it doesn't provide either the control or output you would normally expect from a dedicated wash light, but it's undeniably useful for occasional use.

Pan and tilt

The pan-and-tilt range of the Elation Platinum Spot 5R is selectable between a standard 540° or optional 630° in pan and 265° in tilt. I ran my tests at the standard 540°, and measured pan speed over that angle at three seconds and 2.8 seconds for 180°. In tilt, the figures were 2.5 seconds for the 265° and 2.2 seconds for 180°. Both pan and tilt have optical encoders to reposition the fixture if it is knocked out of place. Interestingly, the 180° times weren't much quicker than the full-range ones; this seems to be a function of the deceleration profile, which had more effect with shorter moves than longer ones—slightly odd.

Repeatability accuracy was measured at 0.22° for both pan and tilt, which is about 0.9'' at a 20' throw. The hysteresis was small, as the fixture noticeably slowed down and edged into its final position. No objectionable bounce or judder on either axis.

Noise

As mentioned at the start of this article, this type of lamp requires very careful cooling and, not too surprisingly, fans were the most noticeable noise emitters in testing. Pan, tilt, and zoom had a bit of whine at some speeds, but pretty much everything else was quieter than the fans.

SOUND LEVELS	
Ambient	<35 dBA at 1m
Stationary	50.0 dBA at 1m
Homing/Initialization	56.1 dBA at 1m
Pan	54.9 dBA at 1m
Tilt	55.5 dBA at 1m
Color	50.0 dBA at 1m
Iris	50.0 dBA at 1m
Prism	50.0 dBA at 1m
Gobo rotate	50.6 dBA at 1m
Gobo select	50.5 dBA at 1m
Focus	51.1 dBA at 1m
Strobe	50.0 dBA at 1m
Frost	50.0 dBA at 1m

Figure 16 - Drivers

Figure 17 - Tilt

Figure 18 - Top box

Homing/initialization time

The Elation Platinum Spot 5R took 21 seconds to complete a full initialization from first powering up, and 27 seconds to perform a system reset while running. It is badly behaved on return from a reset, as it opens its shutter before reaching the final pan-and-tilt position, so remember to black it out before a reset.

Electronics and control

Following the current trend, Elation has electronics distributed throughout the unit, primarily in the top box and yoke arms. Figure 16 shows one yoke arm, containing six motor drivers, while Figure 17 shows the other, which has four more motor drivers and the tilt motor. This distribution in the yoke arms makes for short cable lengths, keeps sensitive electronics away from the hottest areas, and minimizes the conductors that have to pass through the main pan bearing and its 630° of rotation. Power supplies for electronics and the lamp are in the top box, as shown in Figure 18, and are easily accessed for service.

As is becoming common in modern automated lights, Elation provides a high-resolution color LCD screen for the menu, along with a familiar control pad (Figure 19). I have to admit that, although it's very crisp, some of the text was a little small for my aged eyes. This menu offers all the usual DMX 512 configuration functionality along with stand-alone, programming, and maintenance options. The Elation Platinum 5R also offers battery power, to allow setting fixture parameters before power is available. Unfortunately, the unit I had was not fitted with a battery, so I was unable to test this.

The connection panel offers both five-pin DMX512 XLRs and three-pin XLR connectors. A nice touch is the pin out diagram on the panel (Figure 20).

Construction and serviceability

Construction is clean and tidy, and shouldn't present any problems for servicing. It's not modular, so working around the gobo area in particular in such a compact unit is a little cramped, but nothing unusual. Just to reiterate what I've said before in these reviews: I have no way in the short time I have a product in my workshop to test for long-term reliability in use, but I spotted nothing that gave me cause for concern.

So, there it is, the Elation Platinum Spot 5R. The two main distinctive features of the product to me are its small size and flat field, both benefits of the MSD Platinum 5R lamp. It's an interesting first outing for the lamp, which performs well for its 189W. I suspect it's a lamp we'll see more of, especially if the claimed 2,000-hour lifetime is achieved in real units. (Philips is actually looking at increasing this figure as it gains more field experience.) Is this the fixture for you? As always—you get to decide.

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Figure 19 - Display

Figure 20 - Connectors