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Clay Paky Sharpy Wash 330

By: Mike Wood

Figure 1: Fixture as tested.

Clay Paky has enjoyed enormous success with the Sharpy over the last couple of years. The company hasn't said, but I'm sure it must be its best-selling product ever, perhaps only beaten by the Golden Scans it used to manufacture and sell by the thousands back in the golden days of disco in the 1980s. An enormous success like the Sharpy can be something of a double-edged sword for a manufacturer; it's fantastic while it lasts, but how do you keep the momentum going and justify the larger company you have built up on the back of it? They are levelheaded folks in Bergamo, and I know they are pondering these issues. They've brought out a new range of LED products this year and have followed the Sharpy with the product I'm looking at today, the Sharpy Wash 330.

At first glance, the name seems like a bit of an oxymoron. How can a wash light be sharp? However, I don't think we are supposed to take the name too literally. Instead, think of it as a product family name. What we have here is a very small, lightweight, automated wash unit that uses a lamp similar to that in the Sharpy but more powerful. It is physically of similar size and has an optical system that allows it to produce a very narrow beam, albeit soft-edged, that gives it kinship with the Sharpy spot unit. Although also designed for aerial effects, the Sharpy Wash 330s can provide a long-throw wash with zoom and color mixing. How does it perform? Will it help Clay Paky keep its sales momentum going?

This review follows my typical format: We start with the lamp and work along the optical train, measuring everything as objectively as possible, ending with the light output. For this review, all data comes from tests I carried out on a single unit supplied to me as typical by Clay Paky. I need to add the same caveat to this review as I did to the one on the original Sharpy and other tight beam effects units: Measurements don't tell you the entire story with luminaires like this. Because the main use is for effect rather than illumination of performers, it's the way it looks to your eye and the camera that matters, not just the numbers. So please temper your opinions with that in mind, good or bad, and understand that a final judgment can only be made by trying the unit out yourself. All tests were run on a nominal 115V 60Hz supply; however, the Sharpy Wash 330 is rated to run on voltages from 115 – 230V 50/60Hz (Figure 1).

Lamp

The Sharpy Wash 330 uses a Philips MSD Platinum 16R lamp (Figure 2). It is a close cousin to the lamp used in the original Sharpy, but is rated at 330W as opposed to 189W. It also has a larger arc gap, 1.3mm compared with 1.0mm, and roughly 30% higher output, but with a 30% longer arc. A wash light optic can usually deal with a longer arc and its higher etendue with no real problem; there's no tiny gobo aperture to get through, so we should expect to see higher output from the Sharpy Wash 330 compared to the original Sharpy. The Platinum 16R is a 1,500-hour life lamp rated at a nominal 14,550lm with a color temperature of 8,000K.

Lamp change is a little intricate but, because all fasteners are captive, should be possible with the fixture in the rig. You have first to remove both top and bottom head covers, exposing the lamp housing and its associated cooling (Figure 3). The small fan you can see on the right of Figure 3 can then be unplugged and unscrewed together with the top plate, which can be lifted off to expose the lamp itself (Figure 4).

Figure 2: Lamp.

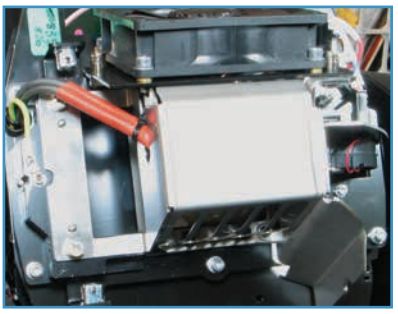

Figure 3: Lamp housing and cooling.

Figure 4: Lamp in situ.

Finally, two more screws allow removal of the surrounding metalwork. The lamp can then be slid sideways against restraining spring fingers and angled out of the unit. I found this last stage slightly tricky, as the edges of the metalwork you have to push against are very sharp and cut into my thumb. Either Clay Paky needs to remove the sharp edges, or I should have worn gloves. (This is probably a good idea anyway, as you shouldn't touch the lamp capsule with bare fingers!)

All this finagling to get at the lamp is so that it can be adequately cooled. These bare short arc lamps are very demanding and have to be cooled very accurately. Clay Paky has a large fan pulling air through the lamphouse plus a small extra fan directing air onto the lamp pinches and the inner capsule. This second fan directs its airflow through a small duct directly underneath the angled hot mirror, as shown in Figure 5. I've spent some time describing the lamp assembly as, firstly, with its integral reflector, it's a critical component that drives the rest of the design, and, secondly, that's pretty much all there is to the optics! Ignoring color and effects for the moment, the Sharpy Wash 330 optical system is very simple, comprising the lamp, an aperture, and the output Fresnel lens.

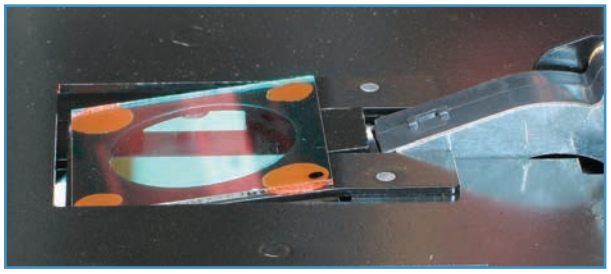

Figure 5: Lamp cooling and hot mirror.

Dimmer

The dimmer is mounted immediately after the hot mirror. This is a slightly unusual design. It uses a common principle but is laid out slightly differently than usual. You can see it clearly in Figure 6. The dimmer is a tapered slot cut around an arc of an aluminum disc. There is a full-size aperture at one end, and it increasingly tapers down, cutting out more and more light until it's just a narrow slit. The dimmer curve produced by this is quite smooth and approximates well to a linear dimmer (Figure 7). However, it does visibly vignette the light. You can see the sides closing in, and the beam becomes more and more oval along a diagonal axis as dimming progresses. This effect changes depending on the zoom position you are at and which level of diffusion, if any, you are using but is always present to some extent.

Figure 6: Dimmer and color wheel.

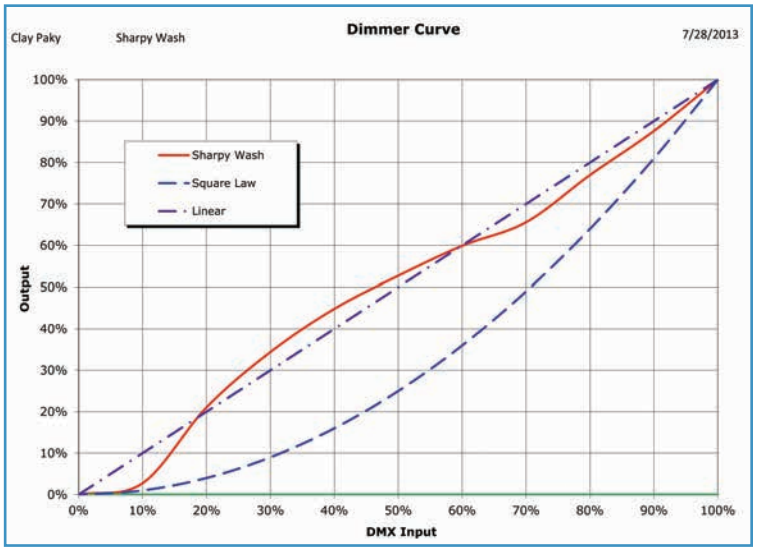

Figure 7: Dimmer curve.

Color

Next in line are the color systems. The Sharpy Wash 330 has a three-wheel CMY color-mixing system as well as a single fixed dichroic color wheel. Both of these can be seen very well in Figure 6. The CMY color-mixing system uses conventional dichroic wheels etched with a familiar finger pattern. When the Sharpy Wash 330 is in its wash mode, with either of the diffusing flags in place, then the color mixing is even, with good smooth coverage and mixing. If you go into aerial effects mode without diffusion, the color mixing is much blotchier, with visible areas where the colors aren't fully homogenized. Of course, that doesn't really matter when in aerial mode. The user must take care to set up and use the system to suit the particular task. For narrow angles and aerials, I would use the color wheel for its fast, snappy changes, whereas for wide-angled soft wash use, the color mixing is good. Very narrow angle optical systems don't lend themselves very well to color mixing. However,

Clay Paky says that the intent was to give the user as many color options as possible.

When in wash mode, the Sharpy Wash 330 allows you, through a menu option, to preset the color-mixing wheels so that they are always in the light path and you never see the edge of the glass wheel crossing the image. This gives a smoothness to long, slow color fades. Output from the color mixing is as follows; the colors are quite heavily saturated, as you would expect from an effects unit.

COLOR MIXING

Color	Cyan	Magenta	Yellow	Red	Green	Blue
Transmission	20%	4.8%	86%	3.3%	8.6%	1.7%

The fixed color wheel is mounted after the CMY wheels. It contains 11 fixed trapezoidal-shaped dichroic filters, which are glued to the wheel. This wheel doesn't have the same quick-release magnetic coupling that the Sharpy used, so these colors are not easily changeable. However, what this wheel does have in common with the one in the Sharpy is its good half colors and speed of movement. Inevitably, as this is a wash light, the half colors aren't quite as crisp as a spot; however, they are very usable in wider beam angles. They are a little difficult to see at narrow settings.

Shutter

The strobing shutter is immediately after the color systems. This is a simple mirrored flag, which can be seen through the aperture in Figure 6. The strobe is sharp and fast with measured speeds from 1Hz – 12Hz. Clay Paky offers a normal range of strobe types and, because it's a separate assembly, you are able to strobe while dimming.

Frost systems and beam shaper

The Sharpy Wash 330 has two separate frost flags. These can be seen in Figure 8. These can be inserted either separately or together to give three levels of diffusion. The light frost (on the right in Figure 8) is a normal frosted glass filter, while the heavy frost (shown in the center in Figure 8) is actually a diffusing lenslet array rather than a frost. This gives a much more dramatic effect and is responsible for improving color mixing and beam homogenization. I think I'd call it more of a wide-angle homogenizing lens than a frost. You really need to have this in place all the time if you want to use color mixing and get smooth beam edges. Both frost flags took 0.2 seconds to insert or remove.

Figure 8: Frosts and shaper.

FIXED COLOR WHEEL

Color	Red	Orange	Aqua	Green	Light Green	Pink	UV	TC260	TC190	Half Minus Green	Blue
Transmission	2.1%	26%	40%	21%	80%	46%	0.1%	55%	48%	73%	0.5%

I measured the open white of the Sharpy Wash 330 at 7,100K. The TC260 filter reduced it to 2,520K, and the TC190 filter to 3,240K. Like its sibling, the Sharpy Wash 330 has a good range of colors; the reds are inevitably a little orangey because of the lack of red in the lamp, but all colors were strong. I mentioned earlier that the color wheel is quick. The small balanced wheel is very snappy in its movements, and you can get "flash" colors in transitions, which makes for an excellent effect.

COLOR WHEEL

Color change speed – adjacent	< 0.1 sec
Color change speed – worst case	0.2 sec
Maximum wheel spin speed	0.7 sec/rev = 86 rpm
Minimum wheel spin speed	41 sec/rev = 1.5 rpm

Movement in both CMY and fixed wheel rotation and color selection were all very smooth, with no visible steps or jumps.

Sharing the module with the frost systems is the beam shaper. In fact, this is in the same plane as the light frost flag, so the two cannot be used together. As can be seen on the left of Figure 8, the beam shaper is a circular lenticular glass element that can be moved across the beam and then rotated as desired. The effect is familiar; it turns the beam shape from round to oval and then allows rotation and angular positioning of that oval. The magnitude of the effect varied with beam angle, whether or not the diffusing lens (heavy frost) was in place. The effect, as you might expect, was most prominent without diffusion and was useful across the entire zoom range. With frost added, the beam shaping is much less noticeable. I measured the beam shaper insertion/removal time at 0.3 seconds and, once in place, it provides a range of rotation speeds from 86rpm down to 0.63rpm.

Lenses and output

As I mentioned earlier, the optical system of the Sharpy Wash 330 is very simple. If you don't have the diffusing lens in place, then it's just the lamp and the final Fresnel lens, as shown in Figures 9 and 10. The Fresnel lens can be moved back and forth to change the beam angle, with a full range move taking 0.8 seconds.

Figure 9: Output lens.

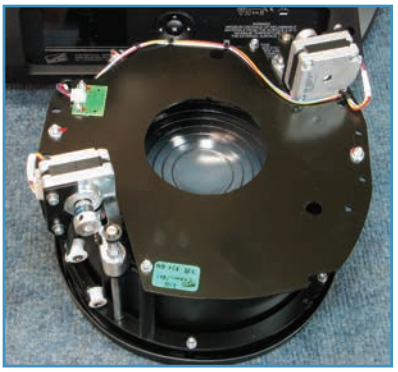

Figure 10: Lens module.

The native field angles for the Sharpy Wash 330 with no frost or diffusing lenses range from 7.7° – 27° as the zoom is changed. That's about a 3.5: 1 ratio. Adding in the frost and/or diffusing lens allows you to increase the output angle to around 50°, albeit with some loss of light of course.

Figures 11, 12, and 13 show the beam profile for minimum zoom with and without frost and maximum zoom without frost. As you can see in Figure 12, the widest beam without frost has a dip in the center. However, if that concerns you, then the frost filters help fill this in. If you compare Figure 11 to Figure 13 (minimum zoom with and without frost drawn to the same horizontal scale, respectively), then you can see the effect of the frost.

As I've mentioned before in reviews of narrow-angle units, it's very difficult to make sense of total lumen measurements. In the case of the Sharpy Wash 330, I measured values between 13,000lm and 15,000lm in wide angles with no frost (which suggests that the lamp output is actually more than the value Philips quotes), but the irregular beam profile makes those readings somewhat suspect. Still, there's no doubt that it's a very bright unit. How bright? I need to leave that up to you and your usage need. One final point: The Fresnel lens has a top hat attached to it that moves back and forth with the lens. This gives you good light spill control at all beam angles, which will particularly appeal to theatrical users.

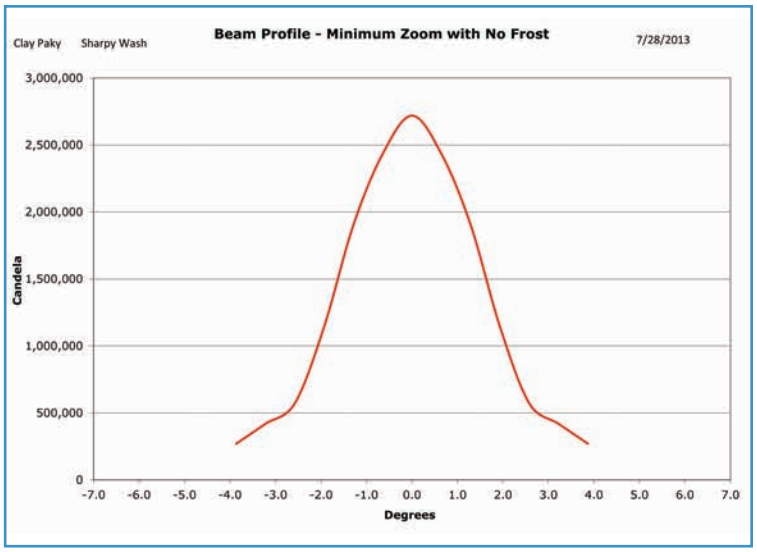

Figure 11: Minimum zoom, no frost.

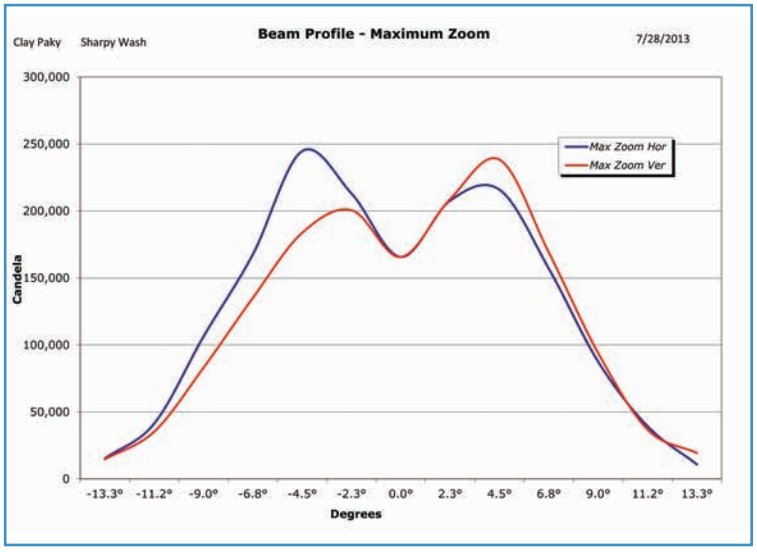

Figure 12: Maximum zoom, no frost.

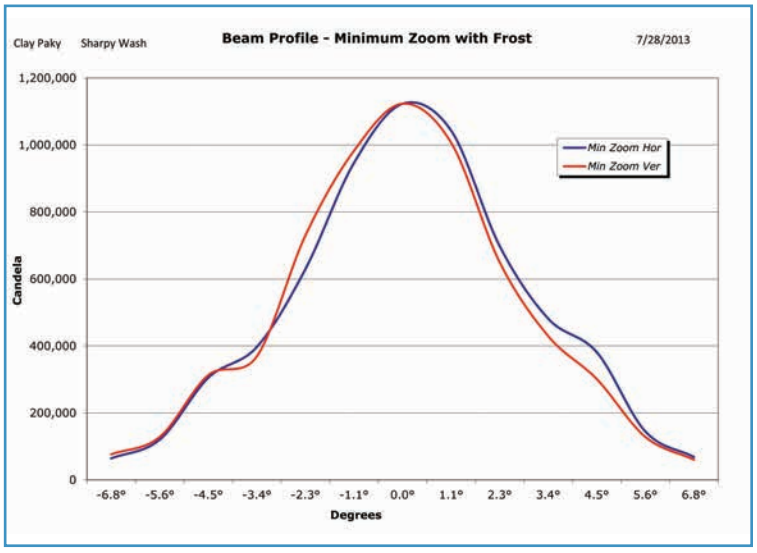

Figure 13: Minimum zoom with frost.

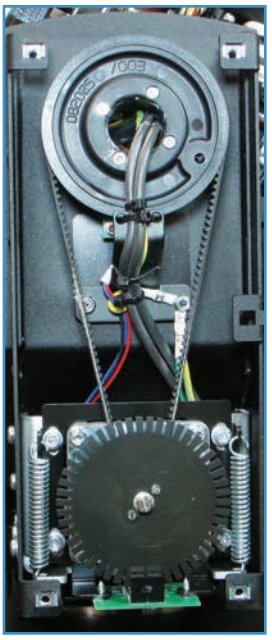

Figure 14: Tilt yoke arm.

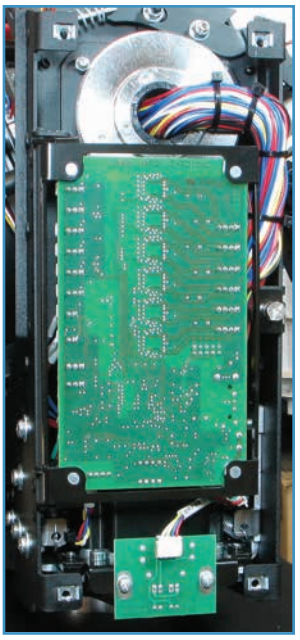

Figure 15: Yoke arm 1.

Pan and tilt

The Sharpy Wash 330 has full pan and tilt ranges of 540° and 240° respectively. I measured pan speed over the full 540° at 2.6 seconds and 1.3 seconds for 180°. In tilt, the figures were 1.4 seconds for 240° and 1.1 seconds for 180°. Both pan and tilt have optical encoders to reposition

Figure 16: Display.

Figure 17: Connections.

the fixture if it is knocked out of place. I measured hysteresis or repeatability 0.23° for pan and 0.08° for tilt, which is about 0.9" and 0.3" respectively at a 20' throw.

Movement in both axes was excellent. Very smooth and tight with very slight overshoot and recovery in high speed moves. Figure 14 shows the tilt system along with its encoder wheel, tensioning springs, and sensors.

Noise

The constant fans produced the bulk of the noise from the Sharpy Wash 330. I leave units to reach thermal equilibrium for at least an hour before taking noise measurements.

Zoom and pan were the noisiest moving elements, and with a couple of speeds, there was noticeable motor whine.

SOUND LEVELS

Ambient	<35 dBA at 1m
Stationary	45.0 dBA at 1m
Homing/Initialization	49.1 dBA at 1m
Pan	48.8 dBA at 1m
Tilt	46.7 dBA at 1m
Color	47.4 dBA at 1m
Zoom	48.4 dBA at 1m
Beam Shaper	45.0 dBA at 1m
Frost	47.2 dBA at 1m
Strobe	45.1 dBA at 1m

Homing/initialization time

The Sharpy Wash 330 took 62 seconds to complete a full initialization from first powering up and 45 seconds to perform a system reset while running. As with its Sharpy sibling, the unit was extremely well-behaved on reset. The software slowly fades the output to black, performs the reset, and then gently fades it back in again. The reset time is long enough that the lamp has time to cool down sufficiently that it can restrike during initialization.

Power, electronics, and control

In operation on a nominal 115V 60Hz supply, the Sharpy Wash 330 consumed 4.1A when stationary. This is a power consumption of 468W with a power factor of 0.99. The power peaked to more than 500W when all motors were running.

The main motor driver electronics are in the yoke arm, as shown in Figure 15 with control and power supplies in the top box. The top box also contains a battery allowing you to program the unit's start address and other parameters while it is still in the road case and unplugged. Access to all the electronic boards, connectors, and assemblies was straightforward.

As with the Sharpy and the company's other automated lights, Clay Paky provides a graphic LCD screen and control pad for parameter setting with the menu providing all the usual functionality including offline operation, setup, and maintenance functions (Figure 16).

The connector panel is also familiar (Figure 17) and offers both five-pin DMX512 XLRs and three-pin XLR connectors, as well as power via powerCON and Ethernet on an EtherCON.

Construction and serviceability

Head construction is around two modules, which you can see removed from the unit in Figures 6 and 10. These contain all the color, effects, and optical systems. Just about everything apart from the lamp. Removing them from the head for maintenance or cleaning is straightforward.

Just like the Sharpy and all the other narrow beam luminaires on the market, you need to be cautious when run-

ning the unit in extreme narrow angle. The beam is very hot and can damage fabrics and scenery from quite a distance.

So, there you have it: the Sharpy Wash 330. How does it shape up as a companion to the original Sharpy? It's a difficult product to categorize. It's called a wash light, but it's probably unfair to directly compare it with traditional automated wash luminaires. Clay Paky has gone for a slightly larger lamp and a very simple optical system, which has its pros and cons. If we keep an open mind and treat it as a new category of product, then it probably isn't correct to compare it with a conventional wash when looking at, for example, the quality of the color mixing. Instead, it needs to be considered on its own merits. I think Clay Paky's marketing information should make that point better; the current literature draws you in the wrong direction. Its small size and good output will surely win it some fans. Will you be one? You have the figures, so you get to decide.

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