Ayrton Wildsun 500C

By: Mike Wood

Fig. 1: Unit as tested

This month, we have a luminaire from a company I'm less familiar with: Ayrton is a French manufacturer, based south of Paris; it has been trading since 2001. It is well-known in Europe as a manufacturer of LED-based products but, until recently, was less well-known in North America. It now has distribution in the United States through Morpheus Lights, which should give its products better exposure. For this review, we are taking a look at the Wildsun 500C, a color-mixing RGBW automated moving head wash light. This is part of a range of units with different LED mixes that Ayrton sells under the Wildsun 500 brand. Interestingly, the 500C model uses a relatively low-color-temperature white LED rather than the high CT used by most of its competitors. We've seen many products entering this sector of the market in the last year or so. In fact, it's currently the busiest portion of the moving light industry. LED wash lights have come of age and are more than capable of competing with their conventional-source cousins; the same will happen soon for spots, I'm sure, but that's a story for future articles. With such a busy sector, the trick is to differentiate your product while still competing on the same broad terms. The LED wash light market has the potential to become commoditized more quickly than any other sector we've seen. How does the Ayrton Wildsun 500C stack up? Can it compete with the other larger players who already have products in place? I hope this review can help you answer some of those questions. As always in these reviews, I've taken as comprehensive a series of measurements of a single unit supplied to me by Ayrton for testing as I can and will present those results so that you can decide whether or not the Ayrton Wildsun 500C is a unit you should be considering for your application (Figure 1).

Light source

As always, let's start at the light source and work our way through the system. The Ayrton Wildsun 500C uses 31 Osram Ostar LED modules, each of which is fitted with four dies, one each in red, green, blue, and white; it has a total power loading of around 13W. Each package is fitted with a stationary 45mm-diameter primary TIR optic to collect, homogenize, and collimate the light from the four emitters. This primary TIR lens is a complex shape with multiple small lenslets on the top surface and a cylindrical recess in the center. The 31 LED packages are mounted on a single large thermally conductive circuit board. Heat travels through the board from the packages into an array of heat pipes mounted on the rear of the board, and those in turn conduct the heat to a stacked array of aluminum heat plates. Figure 2 shows the TIR lens and the top of the assembly while Figure 3 shows a side view of the assembly, with the copper heat pipes clearly visible through the stack of plates. There is a large-diameter aperture through the center of those plates; a single rear-mounted fan draws in air and pushes it through the fins where it exits around the rim of

Fig. 2: TIR Lens

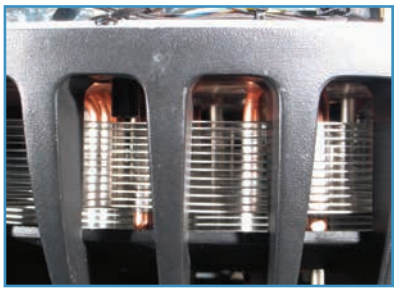

Fig. 3: Heat pipes and heat sink plates

Fig. 4: Head fan

the unit. Figure 4 shows the fan with the protective cover removed. This fan is automatically temperature-controlled and comes in as needed. With the Wildsun 500C running at full power for my testing, it came on at full speed within a few seconds. The unit has relatively good thermal management; I measured a 14% drop in output as it heated up from room temperature to reach thermal equilibrium over about 25 minutes.

Optics

In what is now a common configuration, there is a large moving plate mounted above the array of LEDs and primary lenses, containing a corresponding set of zoom lenses. Figure 5 shows a close-up of one of these lenses, with its faceted surface and central clear section. The entire plate of 31 zoom lenses may be moved backward and forward along the optical axis of the unit through three linear actuators. Figure 6 shows both sets of lenses and one of the linear actuators. This two-element zoom does a reasonable job of homogenizing the four LED colors into a single beam. I did see a little red/blue blotchiness at some zoom angles, but, overall, the performance is good and there were no strangely colored halos. Figure 7 shows a view back into the lenses during color mixing. As I've said before in this column, I've noticed a general improvement in quality of just about all LED luminaires in the last year. The early days of the incredibly blotchy RGB LED PAR cans seem to have largely passed, thank goodness! The lens plate movement, and thus the zoom of the Wildsun 500C as tested, was fairly slow; I timed it at three seconds from one extreme to the other. Output remained smooth throughout the zoom range.

Fig. 5: Zoom lens

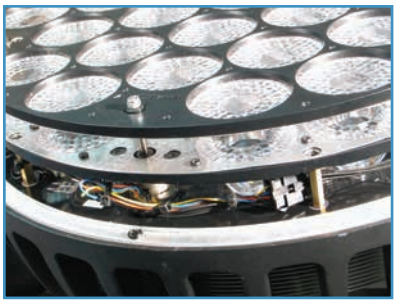

Fig. 6: Lens plate and actuator

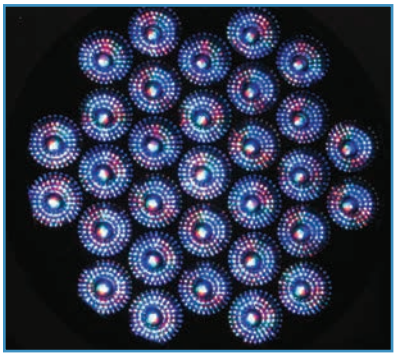

Fig. 7: View into emitters

Output

When running with all emitters at full power, I measured an output of 7,029 field lumens at the wide position, with a 50° field angle ramping down slightly to 6,703 field lumens at the narrow 26° setting. The zoom ratio is just about 2:1. Field distribution is shown in Figures 8 and 9. The curves are smooth and show a good blending distribution. The color with all emitters at full was slightly tinted blue and was too far off the black body line to get a color temperature reading. By dropping the blue emitter down slightly to 85%, I was able to bring it back close to the line and get a CCT reading of 18,000K with little loss of output. You can read more about achieving other color temperatures and the output realized in the color mixing section below.

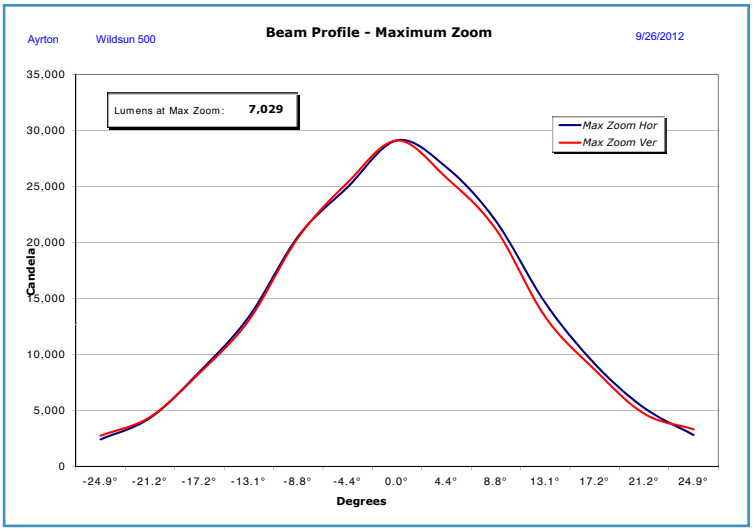

Fig. 8: Maximum zoom

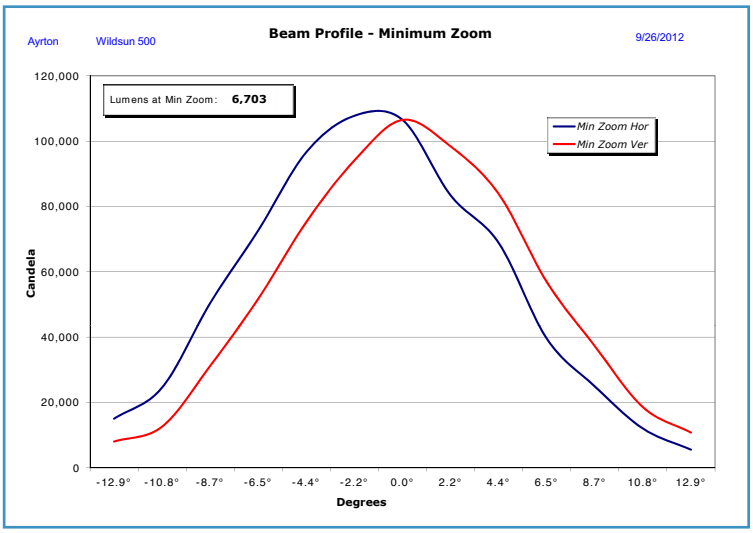

Fig. 9: Minimum zoom

Note: I also measured the Wildsun 500 "K7" model, which is a white-only unit with a specified 6,700K output. This produced a very respectable 16,570 field lumens at a field angle of 62° and 14,920 field lumens at 21°. The zoom range is greater than the C model and also moved more quickly, taking one second from end to end. With 400W power consumption, the wide angle efficacy equates to 41 lm/W.

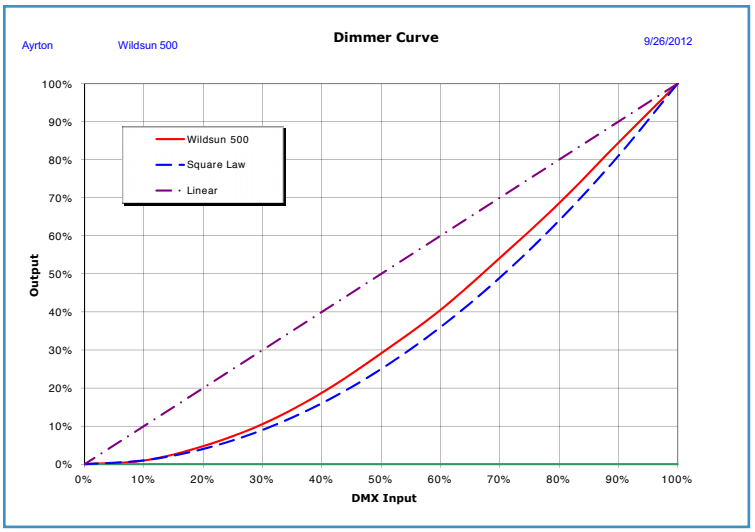

Fig. 10: Dimmer curve

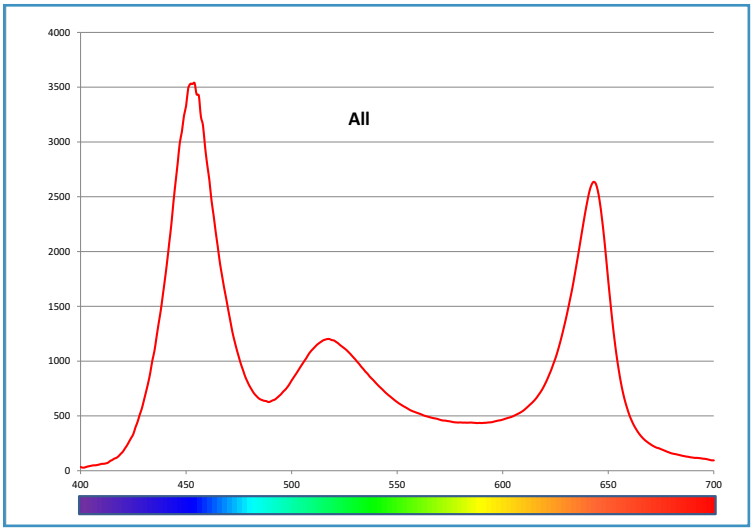

Fig. 11: All emitters

Dimming and strobe

The dimming curve of the Ayrton Wildsun 500C can be seen in Figure 10. Dimming is 16-bit and was very good, with a smooth curve that nicely follows a standard square law. Very little stepping or bumps could be seen throughout most of the dimming range, although a little jerkiness shows up in the bottom 10%. Mixed colors also tracked reasonably well throughout dimming, with a slight shift toward pink noticeable in some colors. The strobe channel provided a measured range of strobe speeds from 1.4Hz up to 30Hz, with the usual options for snap and ramp strobes. I measured the PWM frequency at 300Hz, which is at the slow end. However, the effect is obviated somewhat by the concentric rings being driven independently and sequentially out of phase with each other, which tends to homogenize the average light pulses when lighting an object or person. Conversely, if you point the camera into the LEDs when the homogenization effect won't come into play, the PWM may cause flickering on camera or in video. It was apparent with my digital still camera when taking "eye candy" type shots into the lens.

Color system

The Wildsun 500C gives you standard RGB color mixing, with the welcome addition of a warm white emitter. This can really help with rendering, as it helps fill in the dead spaces in the cyan and yellow, which, to my eye at least, makes RGB look so poor on skin tones. Figure 11 shows the spectrum with all channels at full. As well as offering the options of both eight- or 16-bit DMX512 control of the four color channels, the Wildsun 500C has a color preset channel that allows you to choose from around 30 preprogrammed colors as well as a color macro channel that includes color wheel rainbow effects. The color preset channel includes mixes for 2,700K, 3,200K, 4,300K, 5,600K, 6,500K, and 8,000K whites.

	lumens %	Color Temp, K
All LEDS at full	100%	18,000K
2,700K	67%	3,080K
3,200K	57%	3,480K
4,300K	48%	4,300K
5,600K	57%	5,780K
6,500K	55%	6,320K
8,000K	59%	12,700
White LED alone	46%	3,596

Interestingly, Ayrton has chosen a much lower color temperature, 3,500K, for the white emitter than is often used. It's a reasonable decision—the output of a low color temperature white LED will be less—but, on the other hand, it's a color temperature that is often used on stage and is potentially more useful. The outputs in the main primary colors as a percentage of full output were as follows.

COLOR MIXING

Color	Red	Green	Blue	White	Yellow	Magenta	Cyan
Output	19%	40%	5%	46%	56%	22%	44%

Note that red plus green plus blue plus white apparently adds up to more than 100%—this is because Ayrton does some power sharing and allocates more power to emitters running on their own. I'm sure this is controlled by thermal considerations for total heat loading.

The Wildsun 500C also follows the trend of providing the ability to divide the LED array into smaller controllable sections to provide simple pixel patterning. In this case, you can address four areas independently: the center LED and the three concentric rings around it. Each of the four areas can be in a different color.

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Pan and tilt

I measured the Ayrton Wildsun 500C pan range at 543° and the tilt at 270°. A full-range pan move took 3.5 seconds, while a more typical 180° move finished in 2.9 seconds. Tilt took 2.9 seconds for a full move and 2.5 seconds for 180°. Positional repeatability on both pan and tilt was excellent, with an error of only 0.05°—which is around 0.2" of error at a 20' throw. This is a stiff mechanical system, so the hysteresis is low, but you do get a bit of bounce in the movement. This is a wash light, so it's not a problem in practice. Moving light design is always a compromise between these two conflicting requirements: quick and accurate but potentially jerky or smooth and fluid but potentially inaccurate. Diagonal moves were smooth with no visible stepping. I did see some missstepping on pan once or twice, but the positional feedback always corrected it.

Noise

I carried out all my noise tests with fans set to "auto" and a hot unit that had been running at full power for 30 minutes so that the fans were running. This seems to me to be a realistic test.

SOUND LEVELS

	Normal Mode
Ambient	<35 dBA at 1m
Stationary	39 dBA at 1m
Homing/Initialization	47 dBA at 1m
Pan	43 dBA at 1m
Tilt	42 dBA at 1m
Zoom	44 dBA at 1m

Although pan was slightly the loudest, all movements were about the same volume. Zoom is fairly slow as mentioned previously, but its noise level is good.

Electrical parameters

The Ayrton Wildsun 500C has a fully power-factor-corrected auto-ranging (110 – 240V 50/60Hz) power supply and consumed 3.56A, 418W with a power factor of 0.99 when running with all LED emitters at full power but no motors running. This equates to a maximum efficacy at the widest beam angle of 16.8 lum/W. The quiescent load, with no LEDs or motors running, was 0.37A, 40W. Initialization time from power up from cold was 43 seconds, while that from sending a reset command through the DMX512 control channel was 24 seconds. The unit was badly behaved in that it faded the LEDs back in before the pan and tilt reset was finished. (Note: Ayrton tells me it has fixed this in the latest firmware revisions.)

Fig. 12: Control panel

Fig. 13: Connectors

Electronics and control

The Wildsun 500C provides a typical menu system through a small color LCD panel and an array of buttons. The display is very legible and the menu simple to navigate (Figure 12). Turning to connectors, the unit offers both three-pin XLR and the standard five-pin XLR for DMX512 input and output. It also provides integrated wireless DMX512 through a W-DMX system. I'd love to test these wireless systems, but, until there's some standardization, I don't see the point. With multiple different and incompatible wireless DMX512 systems on the market, any kind of interoperability is a nightmare. The connector panel also provides a fixed power input cord, fuse, and a power switch (Figure 13).

Electronics is distributed around the unit with pan and tilt drivers in one yoke arm, zoom driver in the other, and the LED drivers and power supplies in the base. All of them are pretty easy to access and maintenance should be straightforward.


Fig. 14: Pan and tilt drivers


Fig. 15: Zoom motor drivers

Construction

The Ayrton Wildsun 500C follows current design trends with a mix of die-cast and molded aluminum and plastic parts on an underlying chassis to provide an attractive package. It provides yoke locks

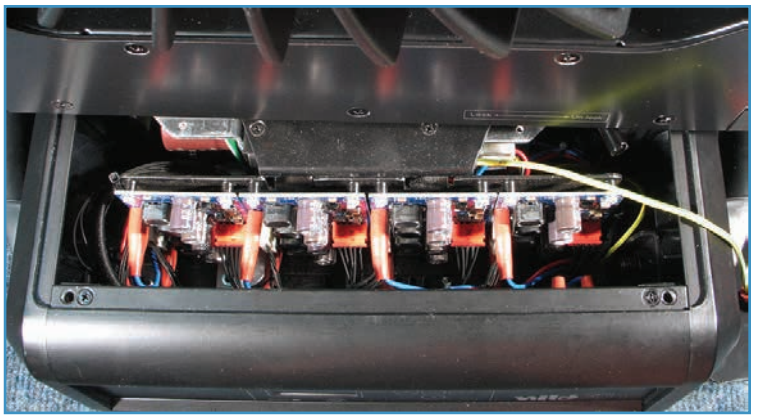

Fig. 16: LED drivers

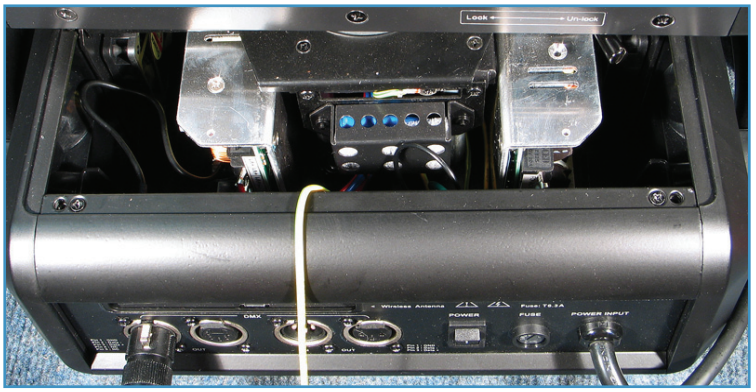

Fig. 17: Power supplies

on both pan and tilt and the usual selection of one-quarter turn locking mounting points on the base. Nothing unusual there. As with many similar units, I suspect changing out LEDs would be a tough job, but, with a rated 50,000 hour life, that's hopefully never going to be an issue.

Conclusions

That just about wraps it up for the Ayrton Wildsun 500C. It enters the market with a feature set that's popular, presented in a familiar-looking package. I hope I've presented some useful data to help you determine for yourself if the unit is one that could be useful to you. As always, it's your decision!

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