

# High End Systems SolaFrame Theatre

By: Richard Cadena

It's a fact of life: Mechanical parts make noise. Or do they?

We know from experience that fans, motors, and spinning parts make noise. You can't get away from that fact. But some mechanics are noisier than others. The US Department of Transportation National Highway Traffic Safety Administration (NHTSA), for example, will require hybrid and electric vehicles to add noise when they are traveling at low speeds, in order to help prevent surprising pedestrians and causing accidents. But the street is a completely different environment than the theatre, where quiet is not only valued, but it's essential to maintain the fourth wall and keep the audience invested in the story.

In the early days of automated lighting, fan and motor noise mostly kept the technology out of the theatre, or it was used sparingly, so as not to impinge on the silence needed during critical passages. Over the years, manufacturers experimented with features like fan speed control, noise baffles, and convection-cooling to better control automated lighting noise. Judging by the number of automated lights in the theatre today, the effort has been fairly successful. But there's always room for improvement, which is what High End Systems has recently focused on with the new SolaFrame Theatre automated luminaire.

The automated moving yoke fixture has a 440W LED white light engine with a CRI of 90+, according to the manufacturer, and a color temperature of 6,000K. (No information is provided about its TM-30 score.) Color options include CMY color mixing, linear CTO, and a color wheel with seven interchangeable dichroic colors plus white. Other features include framing shutters, 7° to 42° zoom, seven rotating gobos plus open, eight static gobos plus open, an animation wheel, iris, light frost, a linear four-facet prism, strobe, and High End's patented lens defog system. The fixture has RDM features, and it has a



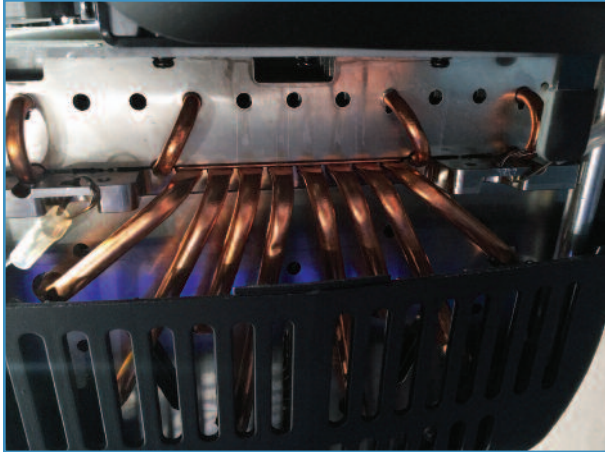
Fixture as tested.

built-in two-port Ethernet switch, which allows it to accept Art-Net or sACN directly and daisy-chain the Ethernet cables from fixture to fixture up to about 20 fixtures, according to the user manual. It can also accept DMX.

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SolaFrame Theatre is fanless and is cooled by heat pipes and convection, which helps minimize noise.

SolaFrame Theatre is part of the SolaFrame line, which includes the 750, 1500, and 2000, and these are part of the Sola line, which, in addition to the SolaFrame, includes the SolaSpot, SolaWash, and SolaHyBeam. Like the rest of the line, SolaFrame Theatre uses heat pipes to help cool the LED light engine, but it goes a step further by eliminating the fans to minimize noise. When you look at the data, it's apparent that the company has achieved significant



A built-in two-port network switch allows the fixture to accept both Art-Net or sACN directly, and users can daisy-chain the Ethernet cables.

improvement in noise reduction.

High End brought in a third party, S&V Solutions, Inc., to measure the fixture noise under various conditions. Using four Brüel & Kjær microphones, the noise was captured from a distance of 39" with three of the mics and 70" away with the fourth while measurements were taken while the fixture was calibrating, tilting, panning, zooming, focusing, etc. The results were processed using Brüel & Kjær Pulse

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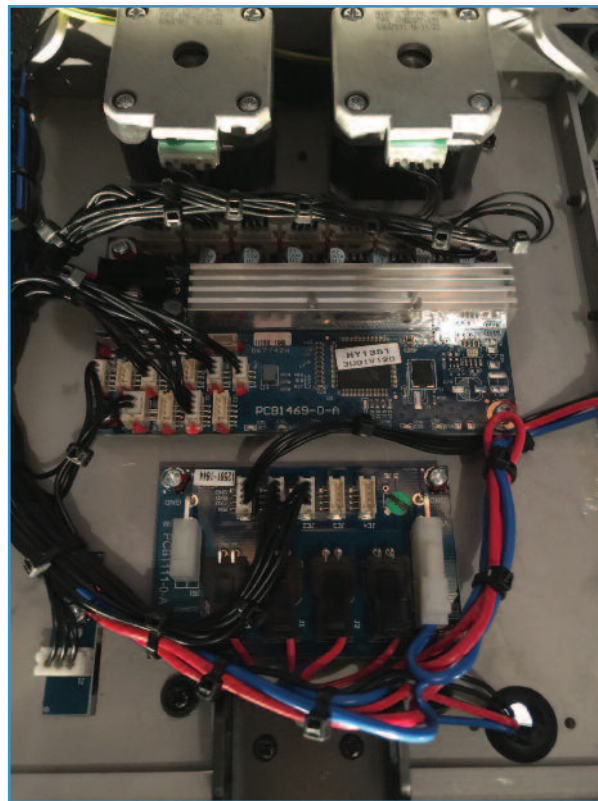
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The two built-in handles on the side of the base make it easier to lift and rig the 110lb fixture.



Internally, the fixture is very modular and the modules are easy to remove and replace.

software and each measurement was averaged across frequencies and A-weighted to better match the human hearing response. The results varied from 2dBA (with a background noise in the test chamber of 1dBA) with the lamp at full and no movement, to 21dBA while focusing and 27dBA while zooming. Under a high stress test, the measurement was 32dBA.

To give these numbers some perspective, consider that the High End Systems SolaSpot 2000 (formerly the SolaSpot Pro 2000) measured 47.6dBA while stationary, 52.6dBA while focusing, and 55.7dBA while zooming, according to Mike Wood's review in the November 2016 issue of *LSA*. In case you're wondering, that's very comparable to some fixtures that he reviewed and slightly lower than others. The results of the SolaFrame Theatre measurements, according to S&V, comply with RC-15 criteria for concert halls and opera houses.

The lower noise levels don't detract from any of the other features. The color-changing can be quick and snappy or slow and smooth. The strobing is sharp, and its effects are what we've come to expect from a professional automated luminaire. The framing shutters are versatile. Each of the four shutters can completely transverse the beam, and the entire assembly can rotate up to 90°. The beam looks very uniform and the center-to-edge focus looks nice. It has a smooth and natural-looking fade to black with no apparent

aberrations or quirks. According to the manufacturer, the illuminance is 4,330 lux at a throw of 10m in narrow zoom (7.3° beam angle, 1.27m or 4' 2" diameter), or 399.8 lux at a throw of 10m in wide zoom (35.6° beam angle, 6.42m or 21' diameter).

Power is supplied via powerCON True1 connectors, which feature breaking capacity, meaning it's okay to connect it or disconnect it under load. It also has a power-through connector, which allows you to daisy-chain the power for two fixtures and better manage power cabling. Internally, the fixture is modular and most of the modules appear to be easy to remove and replace.

The fixture is what I would call medium in size, measuring about 35" tall with the head straight up, and the base is about 22" by 13". At about 110lb, it's a two-person fixture in terms of handling and rigging, which is par for the course in terms of today's automated lighting fixtures. The two handles on the side of the base make it easier to lift and rig.

There are other automated lights with heat pipes and convection cooling, but this is the quietest I've seen. And, in the theatre, where silence is as important a feature as any other, it makes a big difference. As LEDs continue to improve in quality of light, more automated lights will find their way into more applications, including theatre, and I think SolaFrame Theatre will be among the first to get consideration. 📶