STEWART HARMONY G2 ACOUSTICALLY TRANSPARENT SCREEN

See No Evil, Hear No Evil

RATING

PERFORMANCE ★★★★★

SETUP ★★★★★

VALUE ★★★★★

By Michael P. Hamilton

A MYRIAD of boulevards dissects a tract of former citrus groves, referred to long ago as *Hollywoodland*. Of these thoroughfares, singularly, there is Hollywood Boulevard, known the world over for a century of broken dreams. As lore recounts, and contemporary tales of woe reveal, there is little left to ponder beyond *what should have been* after most fame-bound aspirants leave.

But Tinseltown can also yield success stories, such as in 1947 when an unknown named Roy C. Stewart answered a casting call—of sorts—and quite literally became a Hollywood *screen* legend. By 1956, Roy had earned an Academy Award for Technical Achievement, garnering a second one in 1964. Roy and Stewart Filmscreen, as they say, were *Hollywood gold*. No other screen company has been similarly feted, and to this day, Stewart can boast of providing a screen for your home identical to one used to put the final touches on an Academy Award winner.

Which brings us to another Hollywood hopeful: Stewart Filmscreen's new Harmony G2 Acoustically Transparent (AT) projection screen. AT screens using a perforated surface to pass-through sound were introduced during the development of sound enhancement to movies. At first, films were synchronized to discs resembling 78 RPM shellac pressings that contained musical accompaniment, but sound-on-disc eventually yielded to Movietone's superior optical sound-on-film process. To optimize dialogue localization for the new "talkies," theater speaker systems migrated behind AT screens.

The Stewart AT portfolio has long included both vinyl offerings and the company's Harmony woven fabric, a screen material specifically developed to enhance audio fidelity. But with acoustic transparency pushed as a primary attribute, AT screens like the Harmony have typically been plagued by light loss and both color accuracy and white field uniformity issues. Enter MicroPerf. This groundbreaking miniature hole pattern that Stewart designed for home theater screens enabled concealed speaker placement behind a wider range of vinyl surfaces, providing countless possibilities for gain and ambient light rejection formulations. But even with the advancements offered by MicroPerf, suppression of audio detail remains a downside to perforated vinyl screens, with early versions of such designs even requiring passive EQ to compensate for high-frequency roll-off.

That's where the Harmony G2 comes in. The enhanced video resolution available with native 4K projectors forced screen makers to pursue tighter weave patterns for AT materials. Also recognizing a renewed interest in woven designs among audio-conscious videophiles, Stewart set out to update its Harmony fabric into a long-awaited second-generation product, one with dramatically reduced color shift and uncompromised audio resolution. (The company claims exemplary color behavior on- and off-axis plus a measured 1 to 2dB higher sound output measured from 5kHz to 20kHz than its competition.)

Many companies simply source screen materials from third-party manufacturers. Stewart's goal with Harmony G2 was to bring things as in-house as possible, sending engineers out to investigate advancements in fabric milling and materials composition and acquiring suitable machinery for the state-of-the-art weaving process necessary to create a class-leading screen material. But such an effort represented an outlay of Bitcoin-bleeding proportions. The next best option? Locate yarn capable of

Theater: Keith Yates Design; Photo: Jeff Freeman Photography

yielding fabric that could meet challenging optical demands for neutrality and color reproduction, and then collaborate with a milling concern equipped with a specialized industrial loom for weaving the complex, proprietary pattern the project necessitated. This daunting, exhaustive process establishes Harmony G2 as an exclusively Stewart-engineered, quality-controlled product.

PACKAGING & SETUP

My 96-inch-wide by 54-inch-high Harmony G2 screen arrived damage-free in Stewart's traditional bullet-proof packaging. Each interlocking, beveled segment of the included 3.25-inch hewn-aluminum Deluxe frame was swathed in Stewart's light-deadening VeLux, an industry icon by any metric. (The Deluxe frame adds six-and-one-half inches to the screen's total horizontal and vertical dimensions.) The Harmony G2 material affixes to receptor snaps lining the inner perimeter of the frame's backside, while a second, light-damping backing liner attaches directly to the material's dual-sided snaps. Heavy-duty piping borders the screen material to securely embed the snaps and prevent duress during assembly. The carefully manicured sizing, meanwhile, ensures the material weave pattern does not distort from over-stretching.

Some screen makers utilize a compression system for screen retention, with fabric positioned over the frame and the overlap pressed into a receiving channel and pressure-retained by clips. While effective, there is little assurance the weave pattern is preserved (over-stretching alters thread spacing) or inadvertent skewing that could introduce moiré (a visual artifact created by two overlapping patterns) is prevented. Stewart's tidy approach eliminates both these concerns. Stewart also sent accessory "T" stands at my request, allowing for stand-alone use in my temporary review setup. I placed the screen directly in front of a cabinet supporting a Thiel SCS3 LCR speaker located at the screen's center.

The terrific folks at Epson graciously provided a Home Cinema 5050UB 3LCD projector, a highly effective screen evaluation tool, to use for my test. I positioned the 5050UB inside a shelving system, its lens height aligned with the center of the Harmony G2 for the best possible performance. The screen's delivery coincided with the start of the Stanley Cup playoffs, and for the first few days I left the Epson in Natural, a picture mode that tracks very close to the Rec.709 standard at factory default and set the lamp mode to Eco since the image was plenty bright.

PERFORMANCE

After a bit of pre-game warm up, I settled in for some viewing. Note-taking almost instantly ensued: "Fantastic detail, wonderful edge-to-edge uniformity, no motion artifacts in any trajectory." Hockey match broadcasts can present unique on-the-fly tests for any video system. Does the ice look white? Do artifacts arise when players whir past advertising on the "boards" tracked by rapid camera pans? In hundreds of Epson calibrations (professional video calibration is my day job), I've found the on-board motion processing of the company's projectors to be very well-executed, leading me to conclude if nothing on a screen is visibly amiss when it's paired with a top-range Epson, the screen is free of anomalies.

I continued to scrutinize the Harmony G2 for any sign of visual weakness, discovering nothing the closer I peered. Streamed from Hulu via Apple TV, 4K coverage of Formula 1 auto racing by Sky Sports (downconverted and presented on ESPN) looked magnificent. Referencing my viewing notes a few days later, I had graphically circled a group of sentences describing the stunning portrayal of carbon fiber layers within a labyrinth of unpainted, deftly staggered elements comprising an unpainted Mercedes front wing assembly. The fiber pattern looked like the outline of every tile in a completed 1,000-piece puzzle. During these cursory sessions, in no instance did I detect the underlying weave of the Harmony G2 fabric.

Viewing from eight feet away, I scribbled "every intricate, subordinate part of the image is finely chiseled, and retained in motion." While light output in the Epson's Natural mode was only 11.6 footlamberts (ft-L), that proved to be plenty for my viewing distance and environment. Checking out test material after calibrating the projector, I felt nothing more was needed, but one task still remained.

After further calibrating the Epson's Bright Cinema mode to reach the SMPTE 16 ft-L/Rec.709 cinema target, I could not think of a more appropriate Ultra HD movie to watch than *La La Land,* an established reference quality disc. I turned the HDR off on my Oppo UDP-203 disc player, and also set it to downconvert to SDR. Stewart's website indicates that displaying HDR is not recommended for Harmony G2 due to the prodigious amount of light required (see Test Bench). That doesn't mean HDR isn't possible with Harmony G2—it most certainly is. It's just that you will likely require an ultra-pricey projector like a Barco Loki or Njord capable of 10,000-plus lumens output. In every respect this screen is ideal, and perhaps destined for that class of machine.

Early into *La La Land*, Sebastian is shown at the piano in a supper club playing Christmas songs as festive lights sparkle against the otherwise dimmed surroundings. Having been warned about sneaking his beloved jazz into the set between holiday classics, he is abruptly fired, and storms past an inquisitive Mia as he exits. While not a bona fide black-level torture test, I was satisfied that, when combined with Harmony G2's other impressive traits, dynamic range in this scene locked into place.

At a Glance

- \+ Superb uniformity and detail rendition
- \+ Precise color tracking and accurate saturation
- \+ Minimal reduction in audio fidelity
- − Woven design involves inherent light loss
- − Beer budgeteers may find it champagne-priced

Price: $3,242 (as tested)

(800) 762.4999

stewartfilmscreen.com

QUIET ON THE SET

Along with watching sports and movies on the Harmony G2 screen, I devoted time to listening for clarity, particularly in announcers' voices. Out of the gate, I heard nothing distracting: enunciation and sibilants were clean and distinct. After five full hours of a Formula 1 Sunday listening to the varied dialects of the international crew (including Brits with their nuanced "*R's*"), plus drivers from multiple continents, there was no discernable diminishment of intelligibility.

While we all have inherent familiarity with the sound of the human voice, some of us may not be able to pick out Allen Collins' 1964 Gibson Firebird during the guitar solo section of Lynyrd Skynyrd's "Freebird." For a better grasp with the screen's performance with music, I enlisted the aid of a second Thiel SCS3 speaker and played the new remixed stereo version of "LA Woman" by The Doors on Tidal. The cut opens on a dynamic note, with John

Densmore's snare knifing through the muted chords of session rhythm guitarist Marc Benno, and keeping pace with session bassist Jerry Scheff (who, with Benno, was part of Elvis's band). Lead guitarist Robbie Krieger smoothly shares the spotlight here with Morrison's vocals. If any shortcoming was detectable on this very familiar track, it might have been the forfeiture of a bit of sheen to Densmore's cymbals.

CONCLUSION

Readers often make a beeline to a review's summary, so it's best to get this one caveat out of the way: A lot of light is required for displaying HDR, and that is true for *all* projector and screen combinations. So, heed caution when examining gain specifications for the Acoustically Transparent screen category, since an inordinate plus in one direction is often countered by a demerit elsewhere, with the common tradeoffs for woven AT screens including color accuracy, screen uniformity, and attenuation of audio signals.

Screens, like tools, are designed for specific applications, and Stewart has created a reference-grade tool with the Harmony G2. The G2's unparalleled neutrality makes it competitive with Stewart's best screen materials. Its calibrated color balance rivals *really good* flat panel TVs. A lifetime in this industry has taught me how to carefully listen, and I struggled to detect any audible departure from direct sound to that passing through the Harmony G2. This screen should be mandatory for any Zurich-based, bank-draining system using a projector possessing Starship Enterprise photon laser power. But *ANY* system in need of the specialized benefits a woven AT screen provides will reach reference-level with the Harmony G2. It earns my highest recommendation.

The Verdict

Stewart's remarkable new Harmony G2 is a reference-level Acoustically Transparent offering for systems with speakers installed behind the screen.

Test Bench

Screen Target Point	White Point	Luminance (ft-L)
Center (L&R, 2° Avg.)	0.312 / 0.329	16.249
Center Left Side	0.313 / 0.313	13.31
Center Right Side	0.311 / 0.334	13.355
Center Top	0.313 / 0.333	16.16
Left Top	0.313 / 0.334	13.226
Right Top	0.313 / 0.333	13.424
Center Bottom	0.313 / 0.333	15.581
Left Bottom	0.315 / 0.335	12.925
Right Bottom	0.313 / 0.335	13.14
Center Left (from 35° Left)	0.313 / 0.329	15.997
Center Right (from 35° Right)	0.312 / 0.330	16.113

For measurements, I used a Labsphere USRT-99 Spectralon Reflectence Target placed on a tripod directly in front of screen center. (Many screen manufacturers use Labsphere targets as a baseline parameter for a color-neutral, Lambertian reference with 99% reflectance at any measurable angle.)

My luminance target for Rec.709 is 16 ft-L, so I began my calibration and, when finished, the white point was 0.313/0.330, and light output 18.2 ft-L. My 2.4 gamma target was a nearly flat 2.4. Setting the Labsphere aside, I refocused the projector to the screen and ran a pre-calibration pass that would highlight differences, if any, between the reference reflectance target and the screen itself.

The white point clocked in at 0.311/0.330 as light output dipped to 11.935 ft-L—not unexpected for a woven screen, though the lamp remained in Eco. Gamma remained largely corrected, averaging 2.39, rising from 40 IRE and staying at near 2.0 through 100 IRE. Calibration improved gamma tracking, dropping the average to 0.836 with the largest error coming at 90 IRE and measuring 1.53. Light output dropped a very slight 0.269 ft-L.

Color gamut pre-calibration averaged 1.309 with red the leading error at 1.159. After calibration, the average dropped to 0.678, cyan becoming the biggest offender at 0.958. Using the Color Checker feature in Calman software from Portrait Displays, a measurement of 47 different hues, the averaged error was 1.1, with a maximum 3.2 on purplish blue. Blue flower and blue sky upped the average as both measured at 2.8. A slight blue push isn't unheard of with woven screens, but Stewart has managed to deliver a nearly spectrally flat surface based on measurements made with a very capable $2,999 Epson projector.

With the projector's Natural mode selected, the calibrated white point at center screen was 16.249 ft-L and 0.312/0.329. Points measured at the perimeter varied from 12.925 ft-L and 0.315/0.333 to 15.581 ft-L and 0.313/0.334. I don't attribute these slightly lower light measurements and deviations from the white point to the screen, but instead to fall off from the outer circumference of the projector lens and associated chromatic aberrations.

This data indicates how neutral Stewart's screen is. Spectralon is a "static" reference surface material. The screen becomes reference caliber with a compatible projector (and skilled calibrator). This affords another hat-tip to Epson, because if a $3K projector plus this screen, in the standard size of 96 by 54 inches for just above another $3K, can create an image only hundredths of a percent off from reference, that's a challenge unmet a decade ago in metrics approaching six figures left of decimal point.—**MPH**

Specs

DIMENSIONS: Customizable up to 10 feet high and 90 feet wide