Sony
KDS-R60XBR1
WEGA™ HDTV
60-Inch 16:9 SXRD™
Rear-Projection Display
Bill Cruce

Introduction

I have waited long for the chance to get a true 1920 x 1080 pixel TV to review. This rear projector is the first Sony has had available in their new, "reasonably priced" line of TVs using the latest Silicon X-tal (Crystal) Reflective Display (SXRD™) 0.61-inch panels. Last year Sony released two displays using its first generation 0.78-inch SXRD panels, the $30,000 Qualia 004 front projector (reviewed by Greg Rogers in Issue 86, June 2004 of Widescreen Review) and the $13,000 Qualia 006 70-inch rear projector (reviewed by Mike Marks in Issue 96, May 2005). The 60-inch (16:9) KDS-R60XBR1 and its 50-inch sibling, the KDS-R50XBR1, are in production now at Sony's Pittsburgh factory and carry a manufacturers' suggested retail price of $4,999 and $3,999, respectively. The KDS-R60XBR1 picture is stunning and its features are outstanding.

What is SXRD?

SXRD is Sony's brand of LCoS (liquid crystal on silicon), a new micro-display technology related to LCD but working differently. Another popular implementation of LCoS is the JVC D-ILA® technology, used in JVC, Dukane, and Faroudja projectors. The liquid crystal material in LCoS has a structure like other LCDs, but it is sealed directly to the surface of a silicon chip. The electronic drivers controlling the crystals' alignment are etched into the silicon, which allows several million pixels to fit in an area smaller than one square inch. The chip is coated with an aluminized layer, which means that LCoS is highly reflective (rather than "transmissive" like normal LCD), allowing more light to pass. The benefit compared to LCD is that the same amount of light applied to an LCoS panel will create a brighter image. Like an LCD, light passage through the liquid crystal is controlled by the state of polarization of the crystal. But since the light passes through the liquid crystal layer twice (once on the way in and once on the way out after being reflected from the mirror surface), LCoS displays of the same thickness can have twice the contrast ratio of a standard LCD, or they may use a thinner liquid crystal layer and achieve faster response times. Sony has managed to achieve both a fast response time (2.5 ms rise time) and a high contrast ratio (5000:1) for its new SXRD panels. Their first generation panels are specified as having a 10-bit output, which means that 1024 levels of gray can be used to represent each pixel.

General

Panel Size: 60" Diagonal
Panel Resolution: 1920 x 1080
Device Contrast Ratio: 5000:1
Pixel Pitch: 7.0 micrometers
Inter-pixel Spacing: 0.35 micrometers
Response Time: 2.5 milliseconds

Video

Native Resolution: 1920 x 1080
Aspect Ratio: 16:9 (1.78:1)
Shading Angle: 60 degrees
WEGA Engine: WEGA Engine HD video
DRC® MultiFunction Circuitry: DRC-MF v2
CineMotion® Reverse 3:2 Pulldown Technology
Cinema Black Pro: Iris Control and Advanced Iris Control

Audio

Digital Amplifier: S-Master® Digital Amplifier
Dolby® Digital technology
SRS® TruSurround® audio
MTS Stereo Decoder: Auto SAP
Steady Sound® Automatic Volume Control

Inputs And Outputs

Video: component (2); HDMI™ (1); composite (3); S-video (3); PC (1)
Audio: analog stereo (5 in, 1 out); i.Link (3); digital optical (1 out)
Other: RF (2); CableCARD™ (1); Memory Stick® (1); Control-S (1 in, 1 out)
Dimensions (WHD in Inches): 66 x 39 3/4 x 20 1/4
Weight (In Pounds): 112
Price: $4,999

Manufactured In The USA By:
Sony Electronics, Inc.
1 Sony Drive
Park Ridge, New Jersey 07656
Tel: 201 930 1000
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“Have I never seen ‘Dark City’ look so good!”

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had contrast ratios of 3000:1. LCOS panels have a high fill factor, meaning there is little space between the pixels. By placing the wiring area and switching elements under the glass that matches the TV perfectly.

Remote And Controls

The only controls on the set are located on the right side. Hidden under the loudspeaker cabinet, volume, TV/Video (inputs), and menu. On the lower right front of the frame there is a power switch along- side LEDs for power, times, and lamp (when burned out). As with most modern TVs, the remote control has the majority of the control functions. The programmable remote is a long, slim (9 x 2 x 3/4 inches) brushed alu- minum infrared control. It is dominated by a central disc that controls menu movements (up, down, left, right) and a central “enter” button. When controlling a DVD or VCR these buttons function as pause, stop, fast reverse, fast forward, and play, respectively. Below the central disc, arrayed in a curve matching the disc are small buttons for split-screen, antena/antennas, L-Ink, and Memory Stick (Sony’s proprietary portable storage memory). In a matching array around the top of the control disc are but- tons for widescreen, picture, favorites and freeze. “Split-screen” puts two small images on the screen to the right and left of each other with the motion controls you can switch to make one dominant (and the source for TV audio). Unfortunately, only one of the images can be an HDTV image. “Freeze” again puts two small images side by side, only this time one is the frozen image and the other the continuous running image. Below the bottom row of buttons are found a long volume up/down toggle button and a matching channel up/down toggle button. In between the two is a pair of small buttons for Menu and Exit. Above the top row of buttons are four rows of three buttons each in a semicircular arrangement (follow- ing the arc of the control disc) that have numbers for direct entry of channels and a second enter button. Above these buttons are two more rows of three slightly smaller buttons controlling channel guide (for ATSC over-the-air channels), display, and jump (toggles between current and most recent channels). Above these are buttons to cycle through the audio effects, sleep modes, and TV/Video (input selector).

At the top of the remote is a function button and associated lights to cycle through TV, SAT/CABLE, DV/DM, and L-Ink programmable control functions for the remote. The remote cannot “learn” but can be programmed by manufacturer's device codes found in the manual. It comes pre-programmed for Sony devices. Adjacent to the function lights is the only recessed button on the remote, for record or reset. Finally, above this labeled area rests. The TV is one integral unit; there is no separate control box as some HDTVs have. A companion stand, the SUGW12 is an ele- gant combination of brushed aluminum and glass and that matches the TV perfectly.

Appearance

Viewed from the front slightly to the side, one could be fooled into thinking this was a flat panel TV. Compared to rear pro- jectors of old it is remarkably small; its backside tapers to a small bulge at the bot- tom corner making it as thin as 20 inches deep. It can sit on a table top and weighs only about 112 pounds. The sleek design does not powerful enough to bounce off the ceil- ing or walls.

Menus And Functions

The menu key brings up a main menu with seven submenu selections for Video, Audio, Screen, Channel, Parental Lock, Setup, and Applications. There isn’t room to discuss all of the functions here, so I will just highlight the main ones I used. If a reader is interested in details about the menus, they can be found in the downloadable manual (http://www.sony-style.com). The Video submenu has selections for Picture Mode, Iris, Picture (contrast), Brightness, Color, Hue, Sharpness, Color Temperature, Noise Reduction, Direct Mode, and Advanced Video. Picture Modes, which can also be selected from a button on the remote, allows you to store all the other settings in the Video submenu. You can store different settings for each of three modes (Pro, Standard, and Vivid). Advanced Video offers many additional choices for the Pro Mode: DRC Mode, DRC Palette, Advanced Iris, Color Correcter (CTC), Clear White, Detail Enhancer, Black Compressor, and Gamma Correcter (only DRC Mode and DRC Palettes are available in the other two video modes). I turned all of these off except Advanced Iris (high, for greater con- trast), DRC Mode (Chromevision), and DRC Palette (Custom 3, using default). It would take weeks of experimentation to explore each of the Advanced Video settings; it is an engineer’s dream. For more details about the effects of these settings, see Mike Mark’s description in his review of the Quasar Q56 (Widescreen Review Issue 36, May 2005). Basically they add various degrees of enhancement that most video sources simply don’t need.

The Advanced Video setting for White Balance enables a consumer to adjust RGB Gain and Bias. It allows very accurate set- ting of the color temperature of the gray scale; you can separately adjust each of the three main Color Temperatures (Cool, Neutral, Warm). And if all goes wrong, there
is a selection for “Initial Set.” Of course, you really don’t want to adjust color temperature unless you have the proper instrumentation. Each of the White Balance settings can be different for each input (antenna and channel share all the same video settings). Color temperature can also be adjusted in the service menus, but there really isn’t any necessity to do so.

The Audio submenu allows adjustment of Sound Mode (Dynamic, Clear Voice, Custom). Custom allows adjustment of treble and bass as well as balance. There is an Effect adjustment for simulated surround (Stereo, Virtual, Dolby, and Mono). The internal loudspeaker can be turned off, and when it is the audio-out jacks on the rear become active; then there is an option for fixed or variable audio-out. There is an MTS option that becomes available for analog TV channels allowing selection of Stereo, Mono, or SAP. Two analog YPbPr inputs (Video 4 and 7), one of which has analog stereo audio inputs.

The Screen submenu allows adjustment of Wide Mode (Full, Zoom, and Wide Zoom in HDTV; SDTV adds Normal). These can also be selected from a key on the menu. Further adjustments include 4:3 Default (Off, Zoom, Full, Wide Zoom, and Normal) and Over scan (normal, +1, +2). Normal over-scan was about 2 percent; the adjustments added an additional 1 or 2 percent.

The Channel submenu allows setting of Favorite Channels, Label Channels, Auto Program, switchers, and cable cards. As you don’t want to adjust channel and input settings for each channel, Channel Fix allows setting for one channel only if you have a cable box that requires that.

The Setup submenu allows you to choose among Power Saving, High Altitude (boosts fan output to compensate for thinner air), Menu Color, Monitor Standby Language, Info Banner, Caption Vision, and Label Video Inputs. Label Video Inputs was especially useful because I used it to skip unused inputs. There are eight video inputs in addition to antenna/cable inputs. There are fixed selections for what they can be called (Skip, Video “n”, VHS, DVD, Receiver/Satellite, Cable Box, 8mm, DTV, Game, LD, Beta). HD and PVR are added on the two HDTV inputs, but the PC input (8) has only PC and Skip as options. One of the drawbacks to the remote control is that inputs are selected by a single button, and you have to cycle through them to get to the one you want. With eight inputs plus two tuners, this gets tedious quickly. I used the “skip” function of Label Video Inputs to limit my input selection to only those I needed.

The Applications submenu has settings for Memory Stick, Link, Clock/Timers, Diagnostics, and CableCARD. Memory Stick and Link can also be selected from dedicated buttons on the remote. Diagnostics gives useful information about OTA reception, especially signal strength for digital channels. CableCARD gives useful information about the CableCARD, mostly for setting up the card to function with a cable provider.

**Inputs And Outputs**

The Sony KDS-R60XBR1 has rear inputs for cable and antenna RF and a CableCARD slot for a card from your cable provider to give you access to digital and HDTV channels. This same area also has an i.Link input and a Memory Stick slot. Two additional i.Link inputs are available on the rear of the set behind a panel that is recessed in addition to antenna/cable. There are fixed selection for “Initial Set.” Of course, you really don’t want to adjust color temperature unless you have the proper instrumentation. Each of the White Balance settings can be different for each input (antenna and channel share all the same video settings). Color temperature can also be adjusted in the service menus, but there really isn’t any necessity to do so.

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The Sony KDS-R60XBR1 has a mechanical 4.1:3.96 ratio that is good because it is a painted green and 20 IRE), but a little cool (7000K). It was easy to correct 1080p, the exception was green, which was very saturated. Although not saturated, this saturated green had a pleasing effect. Chapter 3 of The Lord Of The Rings: The Fellowship Of The Ring DVD has several good tests of the color green. Green fungus on the trees was almost Day-Glo! Although there was no misconvergence at the edges using the AccuPel multiburst tests. The single-pixel vertical line from the AccuPel was perfectly resolved at 1080i. There was just the slightest hint of pincushion distortion at the edges using the AccuPel crosshatch, but it wasn't apparent on any video images. There was no misconvergence at the edges nor any significant drop off in light level (white float uniformly).

The Sony KDS-R60XBR1 does an excellent job of dentilacing. Although it has three modes Clicked DRC Mode 1, Mode 2 and CineMotion) in the Advanced Video menu. I found that CineMotion performed best on both film and video material. Using interlaced YPbPr input from the Denon 5500i, I looked at the Video Essentials "Montage Of Images." The pan into the leaves, the bobbing branch with ice on it, and the blackerbs just behind the race cars, all difficult video sequences, had few if any jaggies. I saw few discontinuities between Gandalf and Frodo are quite distinct. I've not seen any hint of sunburned skin on any of the many DVDs and TV programs I've watched. The Sony KDS-R60XBR1 has a mechanical ratio so good that it was unmeasurable with the equipment I had available. Black levels were so black that they were below the limit of my meter (0.04 fL). Maximum light output as measured at the screen was about 20 footLamberts (fL), but this did not account for screen gain, which might be as much as 3.5 (Sony would not reveal the gain of their screen). Even without screen gain this would make the estimated contrast ratio at least 1000:1 to 2000:1 (I black level was reading 0.02 or 0.01 fL). My standard test for black level rendition and contrast ratio is Dark City. I have never seen this disc look so good. The really black blacks enhanced the sense of foreboding and ominous secrets in the movie.

Resolution for 1080i HDMI and YPbPr was excellent; rolling off before 37 MHz, the AccuPel HDG-3000 signal generator. There was no misconvergence at the edges of any input (YPbPr) being slightly more correct at 10, 16 than the digital (HDMIG-3000). This resulted in beautiful, warm, film-like images on all inputs.

Colorimetry was exceptionally accurate for both digital and analog, 1080i, and 480p; the exception was green, which was very saturated. Although not saturated, this saturated green had a pleasing effect. Chapter 3 of The Lord Of The Rings: The Fellowship Of The Ring DVD has several good tests of the color green. Green fungus on the trees was almost Day-Glo! Although there was no misconvergence at the edges using the AccuPel multiburst tests. The single-pixel vertical line from the AccuPel was perfectly resolved at 1080i. There was just the slightest hint of pincushion distortion at the edges using the AccuPel crosshatch, but it wasn't apparent on any video images. There was no misconvergence at the edges nor any significant drop off in light level (white float uniformly).

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The opening scenes of Star Trek: Insurrection, and Shakespeare In Love have pans across scenes with incredible detail (for STI) and multiple vertical lines (SL). These were as perfectly rendered as I've ever seen. The set has two tuners, one for antenna (RF800 and one for cable (QUAM). A CableCARD (supplied by most cable companies) uses the cable signal to give you digital channels including HDTV. The Motorola CableCARD that I got from Comcast provided an image that matched the image from my Comcast Motorola DVR cable box (octo800), only I lacked an on-screen guide. I haven't used an over-the-air (OTA) antenna since cable began carrying a large selection of HDTV services. However, I decided to check out the ATSC tuner in this Sony. I hooked up a Silver Sensor indoor HDTV antenna and was surprised to find that I could put in seven digital stations from my suburban location in Washington, DC. Although my home theatre is in a walk-out basement, it has front to ceiling windows along the walk-out side and luckily that points in a direction where most of the major DC digital stations are located. Frequently the OTA images had better resolution compared to cable. Until now, I haven't had a video display capable of reaching the improvement, but the Sony's full 1920 x 1080 sure did! To add icing to the cake, all the stations have guides displaying information about current programming, only visible with OTA reception. There is a menu selection for signal strength (Menu / Applications / Diagnostics) that was very helpful in orienting the antenna. There is a marker on the signal strength bar that indicates the maximum signal received for that channel, usually during the automated setup.

The PC RGB input can accept only a limited number of computer input signals. Of most interest are 1024 x 768 (where it can accept frame rates of 60, 75, and 85), 1280 x 768 (60 fps), and 1280 x 1024 (60 fps). The 1280 x 768 format is the highest resolution PC format that is widescreen; it has a ratio of 1.86, since PCs use square pixels. Most notably the Sony SXRD RP cannot accept a 1080p input, which is the natural resolution of the set. Many modern computers can be set to output 1080p (1080 pixels progressive since that is the only computer output possible) but the Sony's official explanation for why (Sony would not reveal the limit of my meter (.03 fL). Maximum light levels were so black that they were below the limit of my meter (.03 fL). Maximum light output as measured at the screen was about 20 footLamberts (fL), but this did not account for screen gain, which might be as much as 3.5 (Sony would not reveal the gain of their screen). Even without screen gain this would make the estimated contrast ratio at least 1000:1 to 2000:1 (I black level was reading 0.02 or 0.01 fL). My standard test for black level rendition and contrast ratio is Dark City. I have never seen this disc look so good. The really black blacks enhanced the sense of foreboding and ominous secrets in the movie.
It's All About The Picture!

I have described above a variety of video sources used for testing various features of the Sony KDS-R60XBR1. When I just kicked back and watched the set, what did I look at? The Tonight Show With Jay Leno in HDTV on NBC is a favorite, as well as Late Night With Conan O’Brien that follows. I like the shows, and the 1080i image is incredible, especially OTA with the little Silver Sensor antenna. The details in Jay Leno’s and Conan O'Brien’s suit material and the writing on Jay’s coffee cup are incredibly clear in HD. On cable, I watched many movies on Showtime, HBO, INHD and INHD2, including Taking Lives and The Transporter. For DVD, in addition to the Denon and Bravo players, I had a chance to use the incredible new Sony DVD player, the DVP-NS9100ES. My favorite reference disc is still The Fifth Element, now in the Superbit™ version. This is a disc that should have absolutely no sign of edge enhancement, yet should be as crisp and sharp as the display will allow. The colors should be brilliant and deep. And so it was. The combination of the Sony DVD player and the Sony SXRD display gave the best looking Fifth Element I have ever seen. Every strand of LeeLoo's hair was distinct; and slight color differences (orange to yellow) between the strands were clearly seen. The level of detail was not necessarily desirable: the face of the blue opera singer could be seen to be covered with blue makeup rather than blue skin. Seen on the Sony KDS-R60XBR1, the Sony DVP-NS9100ES DVD player could produce an image from a reference DVD like The Fifth Element that equaled or bettered many so-called HDTV broadcasts.

Summary

The 60-inch Sony KDS-R60XBR1 has the most satisfying image I have seen since watching an 8- or 9-inch CRT front projector, but it is brighter and arguably has better blacks and contrasts. It instantly grabs the attention of anyone walking into the room. Cable or broadcast HD sources are simply breathtaking, and DVDs look like I’ve never seen them before. When this set and its 50-inch sibling hit the stores, I predict they will fly off the shelves faster than any previous 112 pound object; hopefully, Sony’s Pittsburgh factory can keep up with the demand (from what I saw on a factory tour it should be able to). I would buy this in an instant, except I’m waiting to see what Sony does with its new second generation SXRD chips in a front projector.