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Technology Excites In Performing-Arts Education

ROTHSCHILD PERFORMING ARTS CENTER RIVALS WORLD-CLASS VENUES.

BY JIM STOKES

The videowall in the lobby of Harker School's Rothschild Performing Arts Center can be programmed to display everything from carefully crafted digital art projects to the events occurring inside in the Patil Theater.

Guests file into the 450-seat Patil Theater in the Rothschild Performing Arts Center.

"There's No Business Like Show Business" sang Laura Lang-Ree, Chair of the Performing Arts Department, to kick off opening night for the Rothschild Performing Arts Center (RPAC) at The Harker School (San Jose CA), which drew a crowd of nearly 700 visitors. Guests included Jeff and Marieke Rothschild, for whom the facility was named, and members of the Patil family, for whom the center's 450-seat Patil Theater was named. Other guests of honor included Diana Nichols, Board of Trustees Chair, and members of the architectural and construction teams, as well as many of the major donors who made the 50,000-square-foot RPAC a reality. The building contractor was DEVCON Construction (Milpitas CA).

"It is a gorgeous building," Marieke Rothschild said. "Harker has been known for its STEM [science, technology, engineering and mathematics] students, and deservedly so. But the talent that is here in the arts—this gives them a home. It is a good-sized theater, but it is intimate."

Rothschild also had some inspiring words for those who are thinking about trying an artistic pursuit, saying, "Don't be afraid to fail. Go out there and fail. Go out there and carry that tune. Just do it! And if you don't want to be onstage, then be behind the scenes. The arts have so much to offer. There is so much out there! You don't have to be a star. Just try it!"

Show biz excitement also permeated the audio, video and lighting (AVL) install, which serves the main lobby, the Patil Theater and other spaces within RPAC.

The AV design consultants were Jedd de Lucia, Principal, and Ian Hunter, CTS-D, Principal, AV Lead, Shalleck Collaborative (Berkeley CA). Our tour guides through the space will be Project Manager Christian Velasquez, from systems integrator PCD (Santa Rosa CA, www.pcdinc.net), and Brian Larsen, Production Manager for Performing Arts (K-12) at The Harker School. Some information in the article is based on Harker-published news sources.

Velasquez noted that outfitting RPAC and its lobby area took three or four months. However, for the overall project, inclusive of coordination and planning, he estimated a year and a half. "We do this sort of performance space throughout the Bay Area," he stated. "The end result is very rewarding. A lot of other trades don't get the same

The Harker Orchestra finally has a home; it held its first performance in the Patil Theater in the Rothschild Performing Arts Center in early May.

satisfaction we do."

Asked about challenges, Velasquez noted that timeline and scheduling were the usual concerns the integrator worked through to get the job done. The other concern was adjusting the lobby videowall's modules for correct framing; we'll cover that later in this story. "The beauty of this project was its new construction," Velasquez said. "When you have new construction, rather than working in an existing building, things tend to go smoother."

The Harker School

Before diving too deeply into the AVL elements, let's learn a bit more about the client. Now in its 125th year, The Harker School is a non-profit, private institution that traces its beginnings to 1893, when David Starr Jordan, the first President of Stanford University, suggested to Frank Cramer that a prep school to supply students to Stanford would be a great thing. The result was Manzanita Hall. Miss Harker's School for Girls opened in 1902, also with Jordan's urging, and, after a number of changes over the years, the two schools merged in 1972 to become The Harker Academy. The school began to operate under the name The Harker School in 1993 to reflect more clearly the character and diversity of the school. Howard Nichols was named President and Diana Nichols was named Head of School. The school has continued to evolve

and, at present, Brian Yager is the Head of School, with Diana Nichols serving as Chair of the Board of Trustees.

Harker is composed of four divisions, each located in San Jose: preschool, lower school, middle school and upper school. It's the largest independent school district of its kind in California, and it has earned international recognition for its top academics, quality teachers and student achievement.

Common AV Technology

Technology that is common throughout the install includes Extron and Cisco switching/transport. Access is via various Extron TLP Pro five-inch or seven-inch

The Rothschild Performing Arts Center opened February 2, 2018, completing a $45 million building program.

All the seats in the Patil Theater of the Rothschild Performing Arts Center are positioned for great views. The theater's stage screen allows the room to be used for entertaining or instruction.

The Patil Theater fills up prior to the start of the program at the opening of the Rothschild Performing Arts Center.

touchpanels, depending on the application. Biamp Tesira DSP and Lab.gruppen amplifiers are also used extensively. OPPO Blu-ray players allow access to DVD and Blu-ray content. The facility also includes Apple TV, which functions as a media player device for class members and teachers. Thus, content can be streamed from a laptop to a projector or to large-screen displays, depending on the room setup. Middle Atlantic racks are located for convenient equipment access; locations include a control rack in the control booth, a stage rack for monitoring performances, and amp room racks for amplifiers and patchbays.

Sound Considerations

In the Patil Theater, there are 300 seats on the main floor and 150 seats in the balcony. The house mixer is a Yamaha QL5 multichannel mixing console with 32 faders and two master faders. "That gives us the potential of doing 64 channels and two layers of 32 channels apiece," Larsen said. "The architect and the designers collaborated to put the in-house mix position just in back of the orchestra, where it doesn't block any sightlines."

"The Yamaha is a good product," Velasquez affirmed. "A lot of these performance spaces and people are attracted to the familiarity of the product. The mixer is portable, so you can have it in the control booth. In addition, there's a mixing station out in the audience using a Yamaha Rio1608-D 16-in/eight-out." Mounted in the outboard Anvil rolling rack are a TASCAM CD player, an Apple Mac mini for control and a Samsung 19-inch monitor. The audio systems' automixer/DSP is Biamp Tesira.

The principal components of the L-Acoustics left/right line-array system include two ARCS WIDE 30°x90° enclosures and six ARCS FOCUS 15°x90° enclosures. Those boxes are augmented by four SB18i subwoofers installed at the proscenium. There are X8 balcony fills and 5XT under-balcony and front-fill speakers. "We also went with four JBLs for stage mixes for now," Larsen noted. The speaker system is driven by a pair of Lab.gruppen amplifiers.

Larsen was familiar with L-Acoustics

Gym AV

The newly built gymnasium is a 33,000-square-foot venue. The full-featured facility boasts training areas, dance spaces, team locker rooms, and therapy rooms with cold/hot plunge pools and an underwater treadmill. The playing court, named after the former school President, Howard Nichols, will host volleyball and basketball games, as well as other events. The bleachers can be retracted completely or be extended just enough to meet the needs of a smaller competition. The facility seats 900 spectators, which is the required minimum to host a Division IV Central Coast Section (CCS) event, and which is big enough to hold the entire upper school student body.

According to PCD Project Manager Christian Velasquez, the gym AV was completed four to six months before the integrator started the theater AV. Uniquely, the multiuse space can accommodate not only sports, but also school meetings, learning activities and entertainment. Stage productions, for example, can be viewed remotely via a feed from the RPAC. Thus, the main AV features include a rolling audio cart with a multichannel mixer and a DLP projector illuminating a large screen.

A rugged Gator Cases G-TOUR rolling cart carries an Allen & Heath 16-channel mixer and a TASCAM CD player for flexibility. "The gym has several locations to plug into the main sound system for game announcements and sound to accompany the screen showings," Velasquez said. In addition, there are two Shure SM58 Wireless Vocal Systems for game PA or other entertainment uses. There are two configurations of three JBL two-way AM7215 speakers to cover the space. The bleachers are covered with 90°x50° pattern horns. And the court is covered with wider-dispersion 120°x60° horns. Two Lab.gruppen amplifiers drive the speakers.

AV equipment can be accessed via an Extron TLP Pro 520M five-inch touchpanel. Sources for video display showings are a Blu-ray player, an iPod or a feed from RPAC. A strategically located Digital Projection WUXGA projector fires onto a Da-Lite screen mounted with a 15'x22' black drop for optimum viewing. Monitoring/playback is via a ToteVision 19-inch rackmount LCD monitor with an ATSC tuner. This allows incoming HD and SD signals to be monitored. Assistive listening is provided via an RF system by Listen Technologies.

The fitness, training and team rooms have dedicated AV. To highlight the areas, fitness 203 has one Sharp 80-inch LED display and left/right Electro-Voice powered speakers mounted on either side of the monitor. Training 208 is audio only to accompany training. A pair of Electro-Voice ZXA1-90W-120W self-powered stage monitors brings excitement to training sessions with a maximum 124dB SPL output. They are mounted on Adaptive Technology Group socket mounts. The audio system has a sophisticated RDL attenuator for sound level. The audio sources connect through RDL consumer input jacks.

The team rooms for boys 107 and girls 112 have classroom-style AV for instruction. The separate rooms have three Epson PowerLite WXGA ultra-short-throw projectors on Premier wall mounts imaging on smartboards. Audio support comes from 12 ceiling-recessed Electro-Voice EVID four-inch coaxial speakers, which are driven by Extron amplifiers.

The Rothschild Performing Arts Center features acoustically tuned classrooms and rehearsal rooms. Here, guests gather on a balcony during the February 2 opening.

from a sound company he worked with in the Bay Area. "They sound wonderful," he said. "We've done an orchestra concert, a jazz concert and a choral concert, and it all sounded great."

"The consultant made the decision to go with the L-Acoustics," Velasquez confirmed. "It's a very well-known brand. In fact, a lot of people consider it one of the high-end speaker brands." He added, "They do their job, and they do it very well for this performance space."

Mics include Shure SM58 Wireless Vocal Systems and Countryman B3 lavaliers. "We started with a base package of Shure SM57s, SM58s and some SM55s," Larsen said. "We used 55s in our jazz concert the other day. The jazz teacher was very happy to have that vintage-looking mic out there."

"Both the design of the system and the wiring of the installation have been fabulous," Larsen continued. "We have the flexibility to have the mix position travel from the sound booth back into the lighting booth, and the input system throughout the room allows multiple locations. I've got locations in the orchestra pit and places all over the house where I can patch sound."

Four Music Classrooms

The four music classrooms vary somewhat in size, with the largest being the instrumental ensemble rooms, which are around 30'x50'. The medium and large vocal choral rooms each have a mounted Epson 3,300-lumen, ultra-short-throw projector firing onto white smartboards for display. "The instructor can use the marker board pen to manage content or write on the projected image," Larsen explained. "So, the class can see the additional material added by the teacher, and class members can come up and manipulate content on the board."

Two wall-mounted Tannoy VX 12 speakers are driven by Lab. gruppen amplifiers on either side of the display. Choir songs can be recorded and played back on a TASCAM CD recorder using a pair of Audix condenser microphones. There's also a Whirlwind Mix-7 stereo mixer.

The big rehearsal room and the orchestra room are instrumen-

Art Wins!

In many ways, teaching is a labor of love; that's even truer if technology and teaching are combined. That is the case for Brian Larsen, who is not only Production Manager for Performing Arts (K-12) but also a teacher at The Harker School. He's been teaching technical theater for many years. "This is my 22nd year with the school," he said. "When I was hired, we were one campus, K-8."

Fast forward to present and there are now four campuses, serving PreK-12. "There are 20 full-time performing arts teachers here," he pointed out. "We produce over 50 discrete events a year. That ranges from a performance of a song or two at an assembly up to a full staged production. Our first musical in the new theater was '42nd Street,' and we opened April 19. So, it's a busy, busy place."

Larsen noted that his department includes himself as Production Manager, as well as a full-time Technical Director for sixth grade through 12th grade, and a Technical Director for Kindergarten through fifth grade. In addition, a lighting designer, a costume designer and a handful of technical people work on an hourly, as-needed basis.

"When it came time to build, we wanted it to be state of the art for where we are now," Larsen began, "but we also wanted it to last 15 to 20 years down the line. It not only serves our community, but also helps our kids learn how to do this—so they can go forward to college and beyond, taking their tools with them." He continued, "California is ridiculously expense to live in, and the majority of the people who are sending their kids here are not sending them to become actors, musicians or dancers. However, I've always believed that, if the kids come out of here with a love of art, they will become patrons and we've done our job. They will buy season tickets and teach their children that going to the symphony is important, that dance is important and that theater is important. Art wins, which is great!"

Larsen added, "Once in a while, someone becomes an actor or a dancer, or becomes an opera singer, because that's their identity. That's what they want to do with their lives. And it's exciting to see that!"

It wasn't easy to teach prior to the existence of the state-of-the-art Rothschild Performing Arts Center (RPAC), though. "During a back-to-school day, I'd say to the parents, 'It's like I'm teaching auto shop, but I don't have a car.' Well, we finally have a car!" Larsen enthused. "Previously, we would take the kids over to the middle school for production work, busing them to and from another campus and losing 25 to 30 minutes of class time. And it wasn't even hands on!"

By contrast, RPAC offers hands-on everything. "The kids now have a lab," he said. "My tech class will learn how to run fly rail. They'll help me get the talent show set up—fly in all the drapes and be on a catwalk to focus lights. A couple of kids wanted to be lighting designers; a couple wanted to do sound design. This is a monumental thing!"

tal music session spaces that have similar AV to the choral rooms, except that each one has three strategically placed Sharp 80-inch LED displays. Video sources are via Apple TV or OPPO Blu-ray players. The rooms are similarly equipped with Tannoy VX 12 speakers driven by Lab.gruppen power amplifiers. There's also the combination of a TASCAM CD recorder with two Audix mics and a Whirlwind mixer for recording and playback.

For video projection, a Digital Projection

EQUIPMENT

2   Analog Way VIO 4K analog/digital multi-format converters
1   Audio-Technica AT8035 line + gradient condenser mic
8   Audix M1255B miniature high-output condenser mics
1   Biamp Tesira DAN-1 digital server networking card
2   Biamp Tesira EIC-4 expander input cards
1   Biamp Tesira EOC-4 expander output card
1   Biamp Tesira EX-MOD modular expander device
1   Biamp Tesira SERVER-IO digital network server
7   Biamp Tesira SIC-4 modular analog input cards
4   Biamp Tesira SOC-4 modular analog output cards
1   Blonder Tongue HDA-8-860-20 combiner and distribution amp
3   Christie Digital Pandoras Box media servers
4   Cisco GLC-SX-MMD 1000BASE-SX SFP transceiver modules
4   Cisco SG200-08P 8-port gigabit PoE smart switches
4   Cisco SG200-26P 26-port gigabit PoE smart switches
1   Cisco SG300-10PP 10-port gigabit PoE+ managed switch
2   Cisco SG300-20 20-port gigabit managed switches
3   Clear-Com GM-9 gooseneck microphones
3   Clear-Com HB-702 2-channel select flush-mount headset stations
3   Clear-Com HS-6 telephone-style handsets w/wall/console mount hangers
1   Clear-Com MS-702 2-channel headset/speaker main station
2   Clear-Com RM-702 2-channel headset/speaker stations
1   Contemporary Research QMOD-SDI 2 HDTV modulator
2   Countryman B3 omnidirectional lavalier mic
1   Crown CDi 6000 2-channel, 2100W @ 4Ω power amp
1   Da-Lite Series 200 lace-and-grommet frame w/180"Hx288"W viewing area
1   DataVideo TLM-702HD dual 7" LCD TFT broadcast monitor
1   DigiLED 14.8'Hx33.6'W 3.9mm LED videowall
3   DigiLED Nova 4K HD processors
1   Digital Projection M-Vision 930 WUXGA projector
1   Digital Projection M-Vision LASER 16K projector
2   Epson BrightLink 685Wi WXGA 3LCD ultra-short-throw projectors
4   Extron BB 1 back boxes
2   Extron DTP HDMI 4K 230 Rx DTP receivers for HDMI
7   Extron DTP HDMI 4K 330 Rx long-distance DTP receivers for HDMI
5   Extron DTP HDMI 4K 330 Tx long-distance DTP transmitters for HDMI
1   Extron DTP R DP 4K 330 DTP receiver for DisplayPort
1   Extron DTP T USW 333 3-input switcher w/integrated long-distance DTP transmitter and audio embedding
16   Extron DTP T UWP 232 D 2-input DTP transmitters for HDMI and VGA w/audio embedding
1   Extron DTP T UWP 332 D long-distance 2-input DTP transmitter for HDMI and VGA
1   Extron IN1608 8-input HDCP-compliant scaling presentation switcher w/DTP extension
1   Extron IPCP Pro 250 IP Link Pro control processor
4   Extron IPL Pro S3 IP Link Pro control processors
4   Extron MPS 602 media presentation switchers w/DTP 330 extension
5   Extron TLP Pro 520M 5" wall-mount TouchLink Pro touchpanels
2   Extron TLP Pro 720M 7" wall-mount TouchLink Pro touchpanels
2   JBL CBT 70J-1 2-way line-array columns w/asymmetrical vertical coverage
2   JBL CBT 70JE-1 purpose-designed extensions
2   Lab.gruppen C 10:8X 1,000W 8-channel amps w/NomadLink network monitoring
4   Lab.gruppen E 8:2 800W amps
12   L-Acoustics 5XT ultra-compact coaxial enclosures
6   L-Acoustics ARCS FOCUS constant curvature WST line sources
2   L-Acoustics ARCS WIDE constant curvature WST line sources
5   L-Acoustics LA4X amplified controllers
4   L-Acoustics SB18i high-power compact subs
3   L-Acoustics X8 live monitor enclosures
2   Listen Technologies LA-125 antenna kits for rackmount
2   Listen Technologies LA-326 universal rackmounting kits
2   Listen Technologies LT-800-072-01 stationary RF transmitters (72MHz)
1   Marshall CV343-CSB 2.5MP 3G-SDI/composite compact broadcast-compatible camera
1   Marshall VS-M2812-A CS-Mount 2.8-12mm auto iris varifocal lens

Jennifer Sandusky, vocal music teacher, demonstrates the fine acoustics of the choir rehearsal room to guests during the February 2 grand opening of the Rothschild Performing Arts Center.

The videowall is one of the highlights of the Rothschild Performing Arts Center. Here, it displays the names of all the donors who helped fund the capital campaign used to build the Rothschild Performing Arts Center and the adjacent athletic center.

5   OPPO UDP-203 Blu-ray players
1   Samsung S19B420BW SB420 Series business monitor
3   Sharp LC-80LE661U 80"-class full-HD commercial smart LED TVs
1   Sharp PN-LE701 70"-class full-HD commercial LCD TV
3   Sharp PN-LE801 80"-class full-HD commercial LED TVs
2   Shure QLXD1-G50 wireless bodypack transmitters
2   Shure QLXD24/SM58-G50 handheld wireless mic systems
1   Shure SM58S vocal mic w/on/off switch
1   Shure UA844SWB antenna distribution system
2   Shure UA874 active directional antennas
8   Tannoy VTH TOP HAT pole-mount top-hat accessories
8   Tannoy VX 12 dual-concentric full-range speakers
2   TASCAM CD-500B CD players
4   TASCAM SS-CDR200 solid state and CD digital audio recorders
1   TOA EV-20RPS digital message repeater
2   ToteVision LED-1907HDMTR 19" rackmount LCD monitors
4   Whirlwind Mix-7 versatile stereo mixers
1   Yamaha QL5 digital mixer
2   Yamaha Rio1608-D digital stage boxes

Abridged list is edited from information supplied by PCD.

M-Vision LASER 16K projector is mounted in the upper part of the theater; it displays images on a Da-Lite 180"Hx288"W screen at stage rear. The stage has several battens that bring it into place during a performance. A Marshall HD zoom lens stationary camera is used for recording what's onstage. For monitoring and playback, a stage rack is equipped with a ToteVision LED monitor and an OPPO Blu-ray player.

The lighting package was purchased from Musson Theatrical in Santa Clara CA. The lighting booth console is an ETC 1000. "We went primarily with ETC fixtures for the room," Larsen said. "The front lighting is all Source Four LED Series 2 Lust, and side lighting is ColorSource Deep Blue. Back lighting is ColorSource PARs. And we have the new ColorSource CYC luminaire, which debuted at the latest LDI trade show."

Videowall Display In Lobby

Before even getting inside the Patil Theater, though, visitors will get an eyeful of AV from the DigiLED 14.8'Hx33.6'W videowall in the lobby. Its purpose is to showcase student and professional projects. According to Larsen, Board of Trustees Chair Diana Nichols decided on the LED videowall after a demonstration of the one at Salesforce.com in San Francisco CA. "We have a loop of about 18 minutes of original compositions that runs continuously from 7am to 5:45pm in the lobby every day," Larsen explained. "We're also looking at the students starting to develop some of their own digital content to be featured in that space, as well." He continued, "We also have the ability to switch to the Marshall HD camera and microphone in the theater. That came in handy for our first production, because we were sold to capacity and we had 25 people watching the show in the lobby."

Handling the audio side of the DigiLED videowall are Biamp Tesira DSP, RDL input jacks and Extron DTP HDMI 4K 330 receivers/transmitters for sources such as the theater performance camera. Left/right J-shaped line arrays are powered by a Crown two-channel amplifier. Assistive listening is by Listen Technologies.

For the videowall, the display is controlled by a pair of Analog Way VIO 4K image processors and Christie Pandoras Box video servers and compact players. A factory-certified programmer had to come out and set up the initial programming of the processor. The server controls how the menus feed content to the videowall and what is sent to the screen.

"There are about 200 screen modules," Velasquez explained. "The biggest challenge was making sure that the framing and the supporting frame behind the screen modules were spot on. The videowall is a very unique feature to this site. It was a good experience for us to be a part of it, and the end results are impressive."

Let's highlight some other components of the install. Regarding cable TV access, a Contemporary Research HDTV modulator works with a Blonder Tongue CATV combiner/amp. The portable stage manager station is housed in an Anvil portable case with a Datavideo dual seven-inch monitor. "They can go anywhere in the theater and plug into various input locations to get the video feed," Velasquez explained. According to Larsen, a Clear-Com wired production intercom is currently in use, but the school is budgeting for a wireless system.

The program and paging system includes an Audio-Technica gradient paging mic, a TOA digital message repeater, an Extron 60-watt amplifier and various speakers. Conference room 521, which is used for meetings and other gatherings, has a Sharp 70-inch display and left/right vertical speakers on either side of the display.

DEVCON Construction built the two-story, 50,000-square-foot RPAC, as well as the new gym, whose facility is explored in a sidebar. The 60-foot-high RPAC features a rooftop with a full array of solar panels.

The architects for both the performing arts space and athletic centers were Studio Bondy Architecture (Oakland CA) and Kevin Hart Architecture (San Francisco CA). Shalleck Collaborative was enlisted as consultant to the architects. Charles M. Salter Associates consulted with the architects in designing the acoustics for the theater, the music rehearsal rooms and the related, adjacent spaces.

A great deal of thought was put into the acoustical design. "All the doors have been soundproofed in the classrooms and the production space into the stage," Larsen explained. "Every classroom door is very heavy to seal sound from bleeding."

Larsen continued, "Our scene shop is directly below our orchestra room. We've had people working on construction and running saws when the orchestra was rehearsing upstairs or when the jazz band was playing, and they don't hear us, and we don't hear them. We hear the timpani in the scene shop, but that's more of a vibration than direct sound. That's the only thing we hear down here."

The school also purchased a Wenger Diva Acoustical Shell that focuses the stage sound into the audience. "The band shell system has three ceiling sections up in the flies and 10 freestanding shell sections that surround the stage," Larsen noted. "Since it was installed, the acoustics are so good that you barely have to mic anything upstage. It carries very well into the house." He added, "They've also installed a system of motor-driven acoustic draperies, so we can select which drapes we want to open or close up in the catwalk. That lessens the reflections up there." ▣