Boeing: Aviation History & Future

Case Study

Lightware Visual Engineering

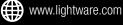| Market	Country
Corporate	USA
Lightware Equipment Used in Project	
HDMI-TPS-RX95	
HDMI-TPS-TX95	
DVI dual-link receivers, Cat6	
DVI dual-link transmitters, Cat6	
DVI-HDCP-OPTM-TX90 DVI	
HDMI-TPS-RX95 4K HDMI	
HDMI-TPS-TX95 4K HDMI	
WP-UMX-TP-TX100-Legrand	
LIGPSU12VP power supply w/IEC plug for 12V remote powering of MX-HDMI-T	
LIGTPSPI1P1 power injectors, single-port standalone for UMX-TPS-TX120/130	
MX-FR65R 65x65 video matrix switcher	
MX-FR80R 80x80 matrix modular switcher w/redundant power supply	
MX-HDMI-3D-IB 4K HDMI input boards	
MX-HDMI-3D-OB HDMI output boards	
MX-HDMI-3D-OB-A 8-channel HDMI 1.4a output board	
MX-TPS-IB 4K twisted pair input boards	
MX-TPS-OB 4K twisted pair output boards	
MX-TPS-OB-A 8-channel twisted pair output boards	

The two actual collaboration rooms at the Boeing Collaboration Center, inside the company's new mid-Atlantic headquarters complex in Arlington VA, are sleek and to the point. Simple, no-nonsense conference tables focused on Cisco videoconferencing systems and 90-inch Sharp displays that were re-engineered by Display Werks to include a touch interface seem ready to get down to business. But to reach them requires taking a trip … something the world's largest airplane maker is especially good at.

Impressive & Functional

That trip is through the rest of the 7500-square-foot "engagement" facility, part of the company's 275,000-square-foot Long Bridge facility that, like the front cabin on one of Boeing's famous 7-series airliners, is as impressive as it is functional. Sitting in the "suite" seat of a B-777's first class and holding a flute of champagne, it almost doesn't matter if the plane ever actually takes off. It's just a very nice place to be. That's how the rest of the Collaboration Center feels; it sparkles and impresses as it tells Boeing's 100-year story. It's what any company would wish clients could pass through before getting down to business. Boeing, via the general contractor, Harvey Cleary, hired AVI-SPL to build out what Bill Chedester, Senior Systems Engineer at AVI-SPL, calls the "wow" that was envisioned for it. "We took that and turned it into a 'wow' you could walk up to and touch:' It's what Jeffrey Bals, Project Manager for the Boeing Collaboration Center, calls an "immersive toolbox" that "gives customers an opportunity to experience Boeing in a way that they have not seen before:'

A Long Walk

QThe 27'x5' Entrance Feature is a multi-sensory visualization of the company's diverse capabilities, combining backlit screens with imagery from ultra-short-throw projectors in a tightly synchronized playout from a workstation/server. The Collaboration Center is set up to take visitors through that narrative in a specific sequence. Upon entering, you're immediately greeted by the 27'x5' Entrance Feature, a multi-sensory visualization of the company's diverse capabilities, combining backlit Christie Micro Tiles with imagery from ultra-short-throw Panasonic projectors in a tightly synchronized playout from a Dell R7620 workstati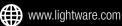on/server. Guests then encounter the Welcome Wall. This 3x3 array of Samsung 55-inch multi-touch displays communicates customized messaging for VIPs: concierge features, such as the weather in their home city or real-time flight arrival and departure info, along with details of the day's agenda mixed in with a comprehensive 100-year history of Boeing. One of two multi-touch interactive table displays located at opposite ends of the Center. Each table features two embedded 42-inch multi-touch computers that can perform object recognition. The Launch Window downshifts the experience a bit, in a relaxed lounge-like atmosphere that offers sofa seating in front of a 90-inch interactive Sharp display that was reengineered by Display Werks and that can render 3D content to showcase Boeing products, as well as touch-enabled simulations. Next comes the Global Presence Wall, which features a 3x3 array of Samsung 55-inch multi-touch displays with custom content about Boeing's global presence, featuring supplier information, economic impact and corporate citizenship efforts, as well as specific detail by country and by worldwide locations.

The 'Jewel Of The Tour'

The jewel of the tour is One Boeing Wall, an impressive array of 18 interactive Samsung displays that includes videoconferencing capabilities on a huge scale and that allows customers to explore and cross-reference Boeing products, services and capabilities. After use, documentation annotated on the wall can be saved and sent to customers for follow-up. There are diversions on this trip. The same application supporting the One Boeing Wall is available on two multi-touch interactive table displays located at opposite ends of the enter. Each table features two embedded 42-inch Multitaction multi-touch displays that feature object recognition. This allows Boeing leaders and customers to place an object, such as carbon fiber or a product model that bears a scannable code, on it to gain a deeper understanding of its capabilities. The displays are enhanced with concealed speakers. SoundTube amplifiers feed Jensen marine-grade speakers that were both small and easily hidden, as well as water resistant, with the thought that more than a few cups of coffee would rest on them over time. The computer that drives each table has two HDMI outputs (one per display), and one of them carries audio. The HDMI outputs are routed through the Lightware matrix and to an HDMI receiver at the table. The receiver feeds an HDMI de-embedder, which sends analog audio to the SoundTube amplifier, which feeds the Jensen speakers.
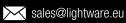
Another side trip can be made to the Horizon Theater, a variable-seat venue in which guests can experience presentations, webcasts and, best of all, flight simulations (some which are so realistic that "steady bars" were installed to let viewers brace themselves}, projected onto a Scalable Display Technologies curved screen illuminated by three Barco F35 7500 lumen projectors. The venue can also be used for two-way video and audio conferences with remote participants. It's an immersive environment that integrates 5.1 surround sound and high-definition image projection on a 180° curved screen. Only then do you get to the collaboration rooms. By that point, you've been totally immersed in Boeing's history and culture. You might even be ready to pull out a checkbook for your own 8-767 (Mark Cuban paid a reported $144 million for his personal 767-277 model). If there are enough visitors, the two rooms can be joined into a single conference area with a touch of a Crestron wireless panel, programmed by PepperDash Technology, which did most of the Center's programming as a subcontractor for AVI-SPL. "Pepperdash programmed the Crestron system to bring the diverse array of technologies into a single, customized interface;' Chedester informed Sound & Communications. "We've partnered successfully with [them] on a variety of projects:' Two wired Crestron touchpanels (one in the staff office and another in the equipment room) control the systems throughout the Center. Collaboration Center staffers also have wireless control using tablets that run a Crestron X-panel that mimics the wired panels. They can touch a map graphic on the wireless tablets to designate different zones to engage the facility's wireless microphones and sound systems. It's quite a tour, and Chedester, acting as tour guide through it, offered that the AV is designed to make a clear and impressive statement from the moment a visitor arrives. "It's designed to impress, as well as to communicate," he stated. Twists & Turns While the components of the large videowalls are plainly apparent, getting them in place was less so. Chedester pointed out that the LCD arrays are behind half-inch-thick glass that had to be positioned precisely over the displays so the touch overlays, from PQ Labs, would work properly. Considering the massive dimensions of the long walls (the One Boeing installation used three pieces of glass, each 90 inches tall by 96

inches wide), that wasn't a simple proposition. First, the glass sheets in crates had to be brought into the building, up the stairwell, manually, using a rigging company hired by AVI-SPL, and then a glazier had to remove them from the crates and install them in place. The LCD displays are hung on custom steel mounts built by rp Visual Solutions (another AVI-SPL subcontractor), which also fabricated a unique worm drive, placed in the middle of an array mount, that lets the display arrays be moved up against the glass in a single motion, in order to achieve alignment with the infrared touch-overlay system. Alignment was achieved using an arcing laser that maintained the "zero" locations for each display. The assembly was tested in rp Visual's shop and then again onsite during final assembly. The worm drive remains in place to allow future access for maintenance of the LCD screens.

"The worm drive holds the mounts in place; the other rail tracks they're on are free rolling;' explained John Brereton, Vice President Of Sales & Operations for rp Visual. "Once the worm drive pulls the mount back, technicians can get in between the LCD arrays and the glass to make any necessary repairs:' When any adjustments are made, the worm drive helps assure that the display array mounts go back in precisely the position required in order to maintain precise alignment with the touch overlay, a tolerance that Brereton said is within 1/32 of an inch. "Even the tiniest variance would be a problem," Chedester added. "The way the pieces are designed, they fit together like a gem:'

The criticality of the large video displays almost (almost) overshadows the alignment challenge involved in matching the visual elements involved in the Entrance Feature wall. In this installation, both ultra-short-throw projection and self-illuminated Christie Micro Tiles are combined, with the former giving way to the latter across the installation's 27-foot length. In the spaces where the Micro Tiles are installed, the projected content is blacked out and that space is illuminated by the Micro Tiles.

"It required perfect pixel-level alignment between the projector and the tiles;' said Chedester, "which could only be achieved by doing that within the content, then aligning the projectors and the cubes perfectly on the wall, which is covered in projection paint:' The content is streamed from two separate Dell computers that were coordinated by Downstream. "The effect is that you see the wall as a single thing, with elements appearing and disappearing seamlessly:' (Downstream CEO Tim Canfield told the Portland[OR] Business Journal, "The designs we are producing for Boeing represent some of our best work to date:')

Audio is less visibly impactful than video, but critical nonetheless. The videowall installations have ceiling-mounted speakers that r un their lengths. For instance, the One Boeing Wall has seven JBL Control 47LPs. The H orizon Theater has three Electro- Voice EVU series speakers making up the LCR array of its 5.1 sound system, and two more used for rear surround,

plus a JBL SB210 subwoofer. JBL Control 23T WH ceiling speakers are also i nstalled, in classic cinema style, in the area just outside the theater's entrance. The LCR array is mounted a bove the screen, hidden by, and ported through, a mostly open grid above the stage. As mentioned earlier, the interactive tables have Jensen marinegrade speakers. "The form factor there was important because we wanted the sound to be part of the table;' Chedester explained.

Signal is transported in analog between two BSS Soundweb London BLU processors and 10 BLU 1/0 expanders that support 16 channels each, which operate as a s ingle system and port to Lightware matrix units. "The distances are not very long and analog works fine for this;' said Chedester. All audio and video run back to a single rack room behind the theater, where six Middle Atlantic racks hold the BSS processing, a Lightware 8Qx80 audio switcher and 65x65 video matrix switcher, three Denon Blu-ray players and the Creston CP3N control system that manages all of the Center's AV. Two wireless Crestron touchpanels are used to operate the Collaboration Rooms; two wired touchpanels (one in the equipment room and the other in the small control room) can operate the entire Center.

After all of the largescale video, it's almost easy to overlook the spaces that the Center was ostensibly named for. The two dedicated collaboration rooms use similar Display Werks multi-touch screens and Sharp 90-inch LCD displays, and they can connect with the same Cisco/Tandberg videoconferencing systems built into the One Boeing installation and the Horizon Theater, giving the center a t otal of four collaborative rooms that can also connect with any of Boeing's meeting facilities worldwide. A portable streaming system is available for use in the theater, to take advantage of its camera-ready backdrop.

It's a big facility for a big company, but also one that reflects how Boeing's products not only take people places, but also keep them connected and engaged in the process, as anyone who's ever watched George Clooney in Up In The Air at 30,000 feet can attest. "There is a lot of wow factor in here:· said Chedester. "The trick was making it look easy:'

Source:
http://www.soundandcommunications.com/aviation-history-future/