THE RANCH

A new, upscale restaurant and saloon brings a long-awaited performance and dance venue for country music to Southern California.

THE RANCH is a state-of-the-art, fine dining and country music establishment located on the ground floor of the brand new Extron Electronics corporate headquarters in Anaheim, CA. A personal vision and dream of Extron President Andrew Edwards, THE RANCH comprises a rustic yet elegantly styled restaurant based on regional American cuisine and fine wines, and a similarly themed saloon next door for live concerts and dancing. This new venue delivers a unique combination of a quality culinary experience with a seasonally driven menu emphasizing the best local ingredients grown on THE RANCH farm, and an intimate setting for musical performances featuring local and prime country music artists.

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Technical Design Team

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THE RANCH Saloon features a large, 47 by 26 foot (14 by 8 m) sunken dance floor for guests to enjoy country music dancing, and be "up close and personal" with the performers on-stage. **Inset:** President and Owner Andrew Edwards and his wife Morgan.

Inspiration for THE RANCH

The inspiration for Andrew Edwards, Extron President and Owner, to build THE RANCH is his deep, lifelong passion for country music and dancing the two-step, as well as fine cuisine. It also stems from an emotional longing for a flagship destination for country music performances and dancing, which had disappeared in Orange County and Southern California since the closure in the 1990s of the legendary Crazy Horse Steakhouse & Saloon. For many years, Andrew would frequent there as well as other venues to experience intimate performances by well-regarded country artists, and dance the two-step with his wife Morgan and his daughter Ashton.

THE RANCH is Andrew's personal vision of a new, special upscale destination that pays homage to the Crazy Horse, while honoring the history of country music in North America. It is also a place where passionate country music fans in Orange County and Southern California can call "home" again.

The Extron Dedication to Customer Satisfaction Extends to THE RANCH

For 29 years, Extron Electronics has been delivering high quality, robust AV product solutions, together with unparalleled, personalized customer support services. Both have always been part of Andrew's uncompromising principle of combining customer satisfaction and product quality. THE RANCH continues to deliver on that business principle through the extensive, year-long culinary R&D program put in place to ensure THE RANCH delivered the best possible dining and wine experience from day one. For further insight on THE RANCH restaurant, see Andrew's article on page 6.

This devotion to customer service also included a comprehensive, multi-year process of conceptualizing, designing, and installing a state-of-the-art, live sound reinforcement system featuring high performance Meyer Sound speakers, as well as high performance AV systems featuring Extron audio amplifiers

and speakers throughout the saloon and restaurant. Simply put, Andrew wanted THE RANCH to be equipped with "The finest sound system available," so that patrons could always enjoy a pleasurable, high quality sound experience, whether watching a live performance, dancing, or dining in the restaurant.

Essential AV Requirements at THE RANCH

Andrew's personal vision for THE RANCH, particularly the saloon, was a revival of the historical, intimate country music club atmosphere that brings on-stage performers "up close and personal" with the fans. The saloon features a 40 foot (12 m) wide concert stage with backstage facilities, plus a large, 47 by 26 foot (14 by 8 m) sunken dance floor. Its seating capacity of 178 patrons, or up to 350 with audience seating on the dance floor, makes it a small club venue, yet one with everyone close to the entertainment on-stage.

More than two years prior to the start of construction in 2010 for the Extron corporate headquarters building, Andrew and Extron Consultant Applications Engineer John Fish began to lay out the essential requirements and plan solutions for delivering all of the AV operations for THE RANCH. Several experts in live sound reinforcement, building acoustics, and broadcast video production were also consulted.

A flexible Extron AV routing system provides HD video to six LCD panels over the Longhorn and Mustang bars.

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High Performance, Live Sound Reinforcement System and Acoustics

The most important requirement for the sound system was that it be capable of delivering very high quality reinforcement for live country music concerts. Basically, the system should be capable of playing music at a moderately high volume level up to 105 dB, with a wide, balanced frequency response and be free of distortion. The sound should generally be perceived as being loud, yet still comfortable to hear. "The system needs to deliver appreciable sound pressure levels as appropriate, but never actually sound too loud to the point of discomfort," says Fish. "This is especially important during concerts, when there is a tendency to really crank up the volume from the stage."

Andrew was absolutely insistent on the sonic character of the room being a vital part of the sound system, since poor room acoustics can negatively impact audio quality. He therefore mandated a holistic approach to sound system design that includes both acoustic treatment and equipment, with the ultimate goal of fully appreciating the sonic performance without acoustical issues getting in the way.

High Quality Background Audio

The requirement for high quality sound also extended to background music for both the saloon and the restaurant. The system design needed to include a large quantity of hi-fi quality speakers rather than conventional paging speakers to ensure full bandwidth music delivery with even coverage throughout. "We wanted to put in a high density of speakers everywhere to avoid the typical 'hot spots,' while allowing us to keep the volume at moderate, comfortable listening levels," Fish says.

AV Presentation Needs

A total of six large LCD flat-panel displays were to be installed in the saloon, four at the 47 foot (14 m) Longhorn bar and two at the 27 foot (8.2 m) Mustang bar. Flexible switching and routing would be necessary, so that staff could switch TV channels for any of the displays, and select the TV channel to be played through overhead speakers at each bar, or engage closed-captioning.

Professional Video Capabilities

Although high performance live sound reinforcement would be the major focus for AV in the saloon, there was also the

Design Challenges and Solutions at THE RANCH

1 Performance venue next to fine dining restaurant

DESIGN CHALLENGE

Sound isolation between the saloon and restaurant must be maintained to keep a lively concert performance contained within the saloon, especially for deep bass frequencies.

SOLUTION

Use a "wall of rooms" design with functional space between the saloon and restaurant. This space, in combination with specialized multi-layered walls creates an effective sound barrier.

2 Large space acoustics

DESIGN CHALLENGE

Create a controlled acoustical environment within a large, 122,000 cubic foot (3,450 m^3) performance space with an RT_{60} value of just 0.8 seconds, essentially the sonic qualities of a high-end listening room.

SOLUTION

Use a generous quantity of acoustic materials integrated into ceilings and walls to limit reflections. Install an overhead 4,500 cubic foot (127 m^3) bass trap to prevent low frequency resonances.

3 Hidden cable pathways

DESIGN CHALLENGE

Design a fully adaptable, flexible system infrastructure for future-proofing, with high capacity cable pathways throughout the saloon, while also ensuring that everything is hidden from view.

SOLUTION

Install wide cable tray systems close to the ceiling that cover the stage and audience areas. Large, below-floor conduits provide concealed cable pathways between the monitor and front-of-house locations. Large conduits also extend through the outer building shell to allow access for production trucks in the parking lot.

4 High performance sound system

DESIGN CHALLENGE

The high performance sound reinforcement system must be of extremely high quality, meet the expectations of top-level touring acts, and be absolutely failsafe.

SOLUTION

Use “rider-friendly” sound reinforcement gear in all critical locations, including Meyer Sound line arrays and subwoofers, and Yamaha consoles at the FOH and monitor positions. Create an analog backup pathway parallel to the primary digital audio path.

5 Multiple sources and destinations

DESIGN CHALLENGE

Provide parallel, flexible signal distribution for both HDMI and composite video to LCD flat panels as well as Extron TouchLink touchpanels for video preview. Endpoints require cabling distances well over 100 feet (30 meters).

SOLUTION

Use Extron HDMI and composite video matrix switchers for signal routing and distribution, together with Extron DTP HDMI 301 twisted pair extenders for HDMI signals.

6 Multiple points of Extron control

DESIGN CHALLENGE

Integrate AV, audio DSP, lighting, and HVAC into a single user control interface, to enable centralized system control from multiple locations throughout THE RANCH.

SOLUTION

Use Extron IP Link Ethernet control processors and TouchLink touchpanels, together with custom technology developed specifically for THE RANCH, to work with AV as well as building automation systems.

The cold storage area and other rooms near the Longhorn bar are designed with multi-layered walls to prevent sound from passing between the saloon and restaurant.

need to support presentations and video productions. This includes adding pan/tilt/zoom HD cameras into the design to allow image magnification - IMAG for on-stage performers and dancers to be captured for routing to large screens and digital video recorders. Infrastructure was also needed to facilitate outside broadcast production crews, and in-house video productions for capturing live performances. The plan was to add video production capabilities sometime after the initial opening of THE RANCH, but have all the available facilities and infrastructure in advance.

System Control

THE RANCH had several system control requirements that extended well beyond switching a TV channel or playing a DVD. A single point of control using Extron technology was needed for controlling the HVAC, lighting, sound system, and AV equipment. This would give authorized staff the ability to tailor the ambient lighting and audio to a particular setting or application, and quickly and efficiently make environmental adjustments to ensure patron comfort and satisfaction.

As a particular example, Andrew wanted the system to be capable of maintaining temperatures on the dance floor and on the stage below 65° F (18° C), with each zone separately controlled. Additional zones would be required throughout the saloon and also the restaurant, with a total of 36 temperature sensors and 33 independently adjustable HVAC zones. All zonal control and monitoring were to be accessible from an Extron TouchLink touchscreen interface.

Challenges and Solutions for System Integration at THE RANCH

The chance to design and build a restaurant and saloon from scratch allows a very unique opportunity to assume total control over all stages of planning and construction, while avoiding the many integration challenges commonly associated with existing building structures. However, many of the specific and even unique application needs for THE RANCH presented their own challenges that required careful planning, system design, and well thought-out solutions.

Sound Isolation Between the Saloon and Restaurant

The saloon and restaurant are separate entities of THE RANCH. One venue will be a lively atmosphere with music presented at appreciable volume levels during concerts and DJ nights, while the other will be a quieter setting with music in the background. With the saloon adjoining the restaurant, a significant issue arises in trying to keep the sound of a concert performance contained within the saloon.

To address the need to attenuate appreciable sound pressure levels from the saloon to the restaurant, Newson Brown Acoustics, LLC, a very well-respected acoustical consulting services company in Santa Monica, CA, was consulted during the architectural design stage to help develop an effective solution. Working in collaboration with GAA Architects, Inc. in Irvine, CA, Newson Brown Acoustics performed detailed acoustical analysis and modeled some potential solutions to isolate sound between the two venues.

A very well-designed, single wall structure would provide some, but not enough acoustical isolation. A barrier with two sound wall structures and a sufficiently sized air gap in between will deliver much better sound abatement, but substantial space would have to be sacrificed. John Fish ultimately proposed a “wall of rooms” with two reinforced walls dividing both halves of THE RANCH, and saloon and restaurant operations spanning between them. This offered the dual benefit of having large air gaps roughly between 8 and 15 feet (3 to 4.5 m) to deliver very significant noise attenuation, while maximizing space between the walls for functional operations of the saloon and restaurant.

Successful sound isolation requires careful attention to detail, taking into account all possible avenues for sound leakage, including the seams where the walls meet the floor slabs and upper floor deck, electrical junction boxes, and gaps around conduit, plumbing, and air ducts. “We really took great care to minimize the potential for objectionable sound ‘bleed-through’ between the adjacencies for the two spaces,” says Michael Brown, Principal at Newson Brown Acoustics. The “Wall of Rooms” sidebar provides more detailed information about the measures taken to isolate sound between the restaurant and saloon.

THE RANCH Floor Plan

THE RANCH is an upscale entertainment venue with a restaurant and saloon, as well as a 14,000 bottle wine cellar. It occupies 20,000 sq. ft (1,858 m^2) of the first floor in the new Extron corporate headquarters in Anaheim, California. There are many unique structural and system design elements in THE RANCH that meet numerous acoustical, performance, and operational challenges in establishing particularly high benchmarks for live sound, pro AV, and system control. The performance and capabilities of the AV systems for THE RANCH are well beyond the norm for fine dining and live sound venues.

A TECHNICAL FEATURE

Restaurant AV Systems

See page 41

B ACOUSTIC CHALLENGE

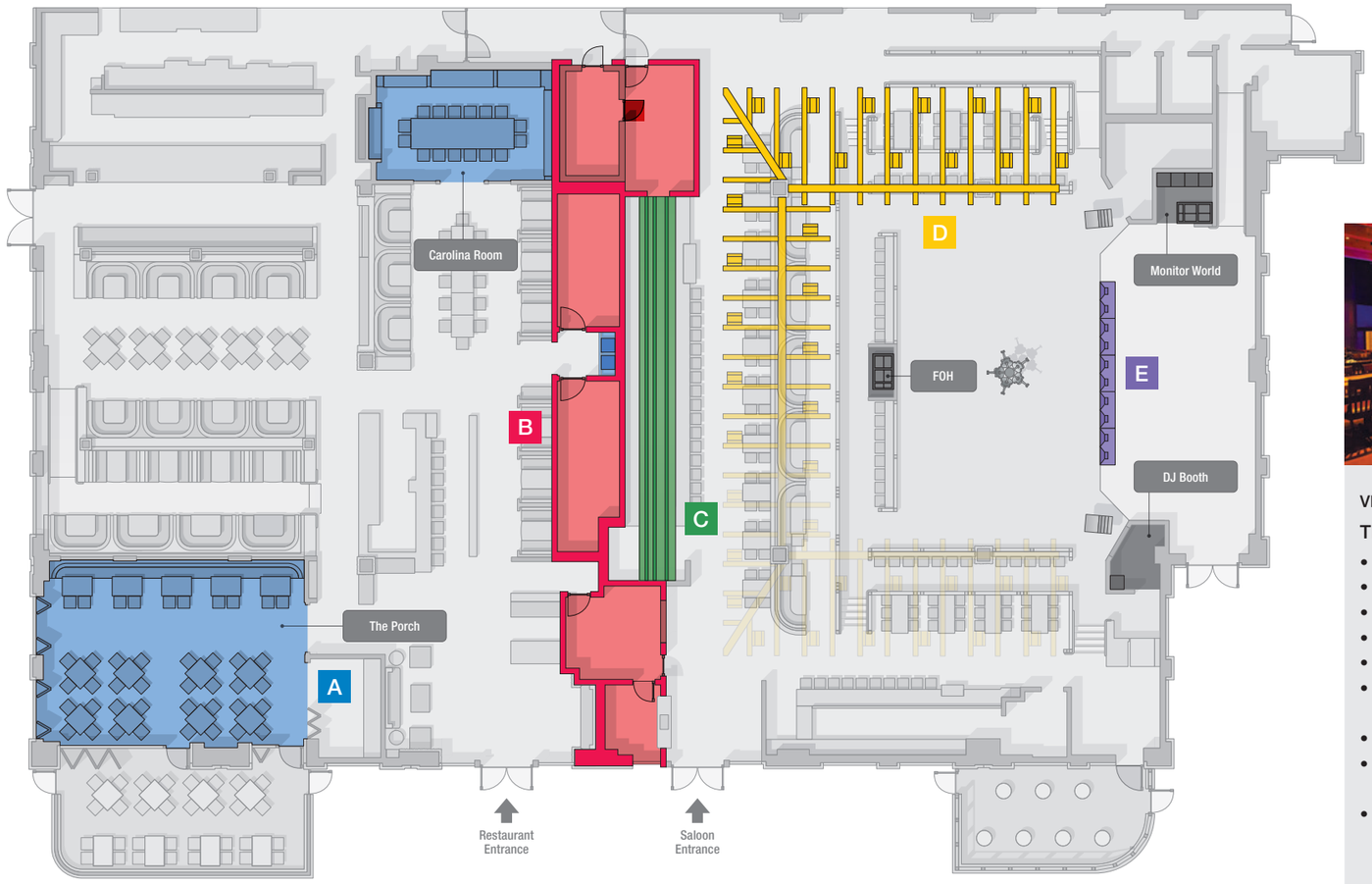
Wall of Rooms

See page 25

C UNIQUE FEATURE

4,500 cu. ft (127 m^3) Bass Trap

See page 26



VENUE FACTS

The Restaurant

- 8,400 sq. ft (780 m^2) facility
- Exhibition-style 3,000 sq. ft (280 m^2) kitchen
- Seating for 360 guests
- Six separate dining areas, including The Carolina Room for private dining, and The Porch indoor and outdoor patios
- Background music system featuring 86 Extron *System Integrator* Series speakers and nine Extron MPA and XTRA Series ENERGY STAR qualified amplifiers
- 12 independently controllable audio zones
- Dedicated AV presentation systems for The Carolina Room and The Porch
- Extron control system with TouchLink touchpanels for AV, lighting, and HVAC control
- Lutron lighting control systems
- Bidirectional digital audio links connect restaurant and saloon audio systems
- Extensive acoustic treatments within ceilings and on walls throughout

D UNIQUE FEATURE

Speaker Constellation in Trellis

See page 32

E TECHNICAL FEATURE

Subwoofer Bunker

See page 30

VENUE FACTS

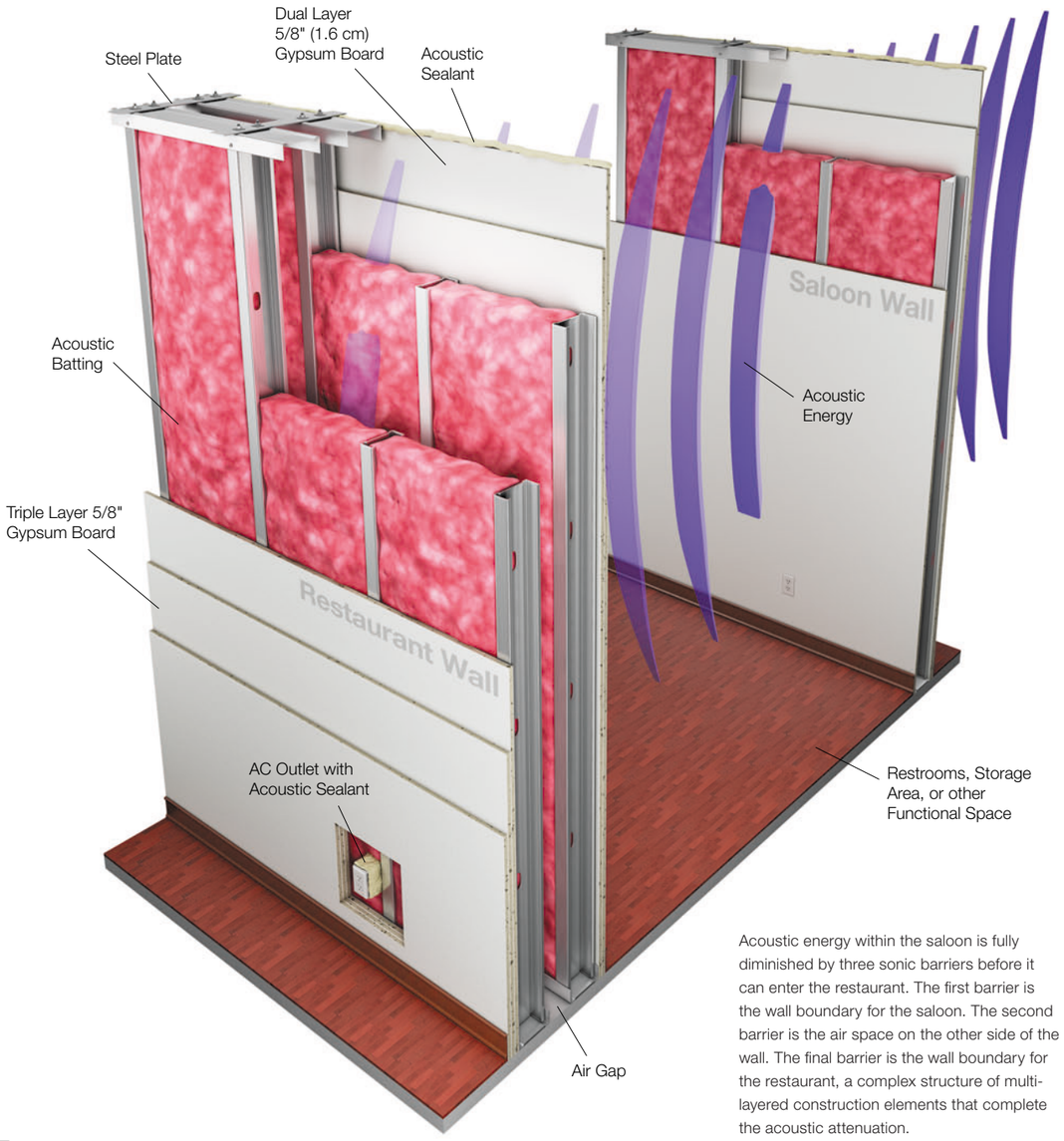
The Saloon

- 8,700 sq. ft (810 m^2) facility
- 40 ft (12 m) wide concert stage
- 47 by 26 ft (14 by 8 m) sunken dance floor
- Longhorn and Mustang full-service bars
- Concert seating capacity of 350 guests
- State-of-the-art sound reinforcement system featuring Meyer Sound speakers
- 14 flown speaker cabinets in two line arrays
- Five double-18 inch (46 cm) subwoofers in a custom-built bunker below-stage
- 87 Extron *System Integrator* Series speakers installed with ten Extron XTRA Series ENERGY STAR qualified amplifiers to support 19 audio zones
- AV system featuring Extron SMX 300-based HDMI/DVI switching, distribution, and long distance transmission via DTP HDMI 301 to six 52 inch (132 cm) LCD monitors
- Extron control system with TouchLink touchpanels for AV, audio DSP, lighting, and HVAC control
- Extensive acoustic treatments on ceiling and walls, plus a large overhead bass trap

THE RANCH
RESTAURANT & SALOON

Wall of Rooms

In order to isolate and prevent live music produced in the saloon from entering the restaurant, the design team utilized a “wall of rooms” concept, in which functional spaces such as the ticket booth, security booth, storage area, and restrooms were constructed between the saloon and restaurant, using multi-layered walls on both sides to block acoustic transmission. Each wall utilizes multiple layers of building material, such as gypsum drywall, acoustic batting, and air gaps. The wall system transduces air vibration – acoustical energy – into wall vibration – mechanical energy – then back into air vibration. These changes in state greatly attenuate the acoustical energy. The functional spaces between the walls span 8 to 15 feet (3 to 4.5 m), providing another important barrier that further reduces the acoustic energy.



Acoustic energy within the saloon is fully diminished by three sonic barriers before it can enter the restaurant. The first barrier is the wall boundary for the saloon. The second barrier is the air space on the other side of the wall. The final barrier is the wall boundary for the restaurant, a complex structure of multi-layered construction elements that complete the acoustic attenuation.

LIFT PAGE
to see the floor plan

Creating a Controlled Acoustical Environment Within a Large Space

The room acoustics had to be well-controlled to minimize their impact on sound system performance. John Fish targeted an RT_{60} of 0.8 seconds for the saloon, which essentially would make it comparable to a benchmark listening room in a production studio. However, the saloon was to occupy a large, 122,000 cubic foot (3,450 m^3) volume in an empty building shell, which inherently presents opportunities for reverberation because of the wide open space and the numerous reflective surfaces.

Acoustical treatments included 6 inches (16 cm) of semi-rigid fiberglass panels on the ceiling, 2 inch (5 cm) semi-rigid fiberglass panels on a significant portion of the walls along the perimeter of the saloon, heavy black drapery lining the back wall of the stage, and a combination of rigid and semi-rigid acoustic panels on the perimeter walls of the dance floor. See the sidebar, “Overcoming Acoustical Challenges.” Some elements of the saloon’s interior design, including the brickwork for the columns and the cedar beam trellis around the dance floor, provided diffusion to give the sonic character some liveliness.

Overall, the room’s sonic character is very well-controlled without sounding excessively damped. “We determined the appropriate quantity of acoustical treatment by detailed calculation, to provide the optimal balance between audio clarity, which benefits from minimal reverberation, and room ambience, which ensures perceptible audience response for the performers,” Brown says.

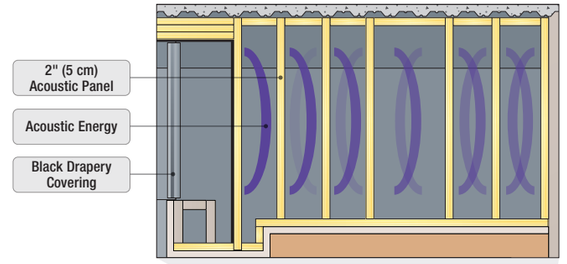
To control the low frequency resonances that can give the bass response within the environment an objectionable “boomy” character, Newson Brown Acoustics took advantage of a large, empty space above the Longhorn bar to design and install a large bass trap. See the sidebar below. This solution proved very effective in absorbing bass frequencies and ensures a tight, well-defined sonic character from the subwoofers.

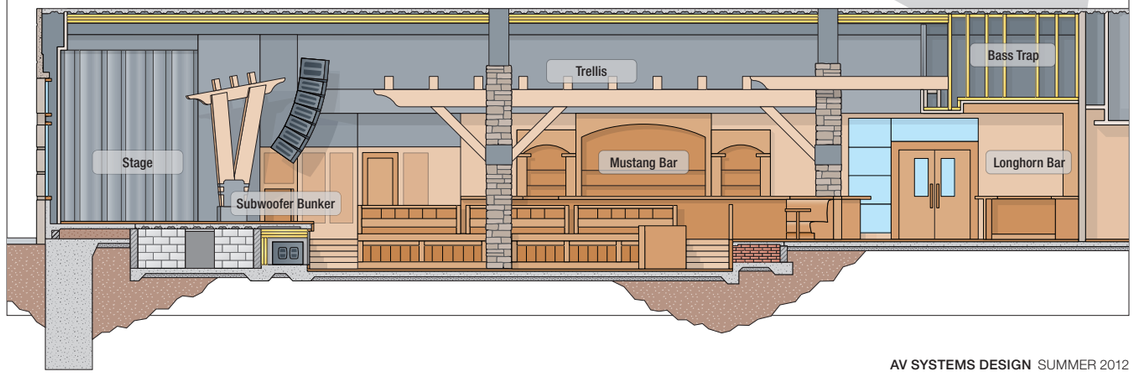
Designing a Fully Adaptable, Flexible System Infrastructure

Commercial AV system designs often include some form of future-proofing to allow some opportunity for expansion. But for THE RANCH, and the saloon in particular, there was a wide range of potential future applications and functions to be supported, especially video presentation and production, as

4,500 Cubic Foot (127 m^3) Bass Trap

A large bass trap, measuring 7.5 ft (2.3 m) tall, 50 ft (15 m) long, and 12 ft (3.7 m) deep, was constructed over the Longhorn bar, directly opposing the stage. It serves to attenuate acoustic reflections and limit standing waves to optimize the low frequency response of the room, significantly improving the clarity of the sound mix. The bass trap utilizes six layers of 2 inch (5 cm) thick semi-rigid insulation panels, spaced out to progressively reduce acoustic energy as it passes through the layers. All surfaces of the cavity are lined with these panels, and the opening is covered with a thick black drape to conceal the bass trap.





An extensive infrastructure of cable trays and conduit travel above and below the stage and audience area in order to accommodate current and future applications and technologies.

well as new technologies that may emerge down the line. John Fish was tasked with the unusual challenge of designing a system infrastructure with the maximum flexibility to basically allow any sort of new technology, cable, device, or application to be incorporated into the system, permanently or temporarily, without major structural changes or system redesign.

Fish designed the infrastructure with a system of overhead cable trays and vertical ladder trays that provide ample reach for routing cables anywhere above and below the stage, and above the dance floor and seating areas. The system originates from the equipment racks in Monitor World, an area at stage right dedicated to the monitor console, amplifiers, signal processing, and audio patching. This cable management system keeps a large quantity of cabling well-organized, and provides plenty of space for expansion and modifications.

Additional cable paths were also provided below the stage and under the dance floor. PVC pipes were installed at the building exterior behind the stage, leading below-stage to a floor box upstage center with additional conduits running to the FOH - Front of House console area, and to Monitor World. Having conduit access at the building exterior will allow direct connection to a video production truck rolled in for a special event or media coverage. The large conduit paths will provide plenty of space for video engineers to easily run whatever cable they need for their cameras and other video equipment in the saloon.

"We asked ourselves the question of what to provide for a broadcast truck, whether triax, SDI, or fiber," Fish says. "Ultimately, the answer was simple – none of them! Just provide a generous conduit path so anything can be brought in with no restrictions."

Fish also included extensive tie lines for XLR, coaxial, fiber, and CAT 6 connections extending from dedicated patch panels

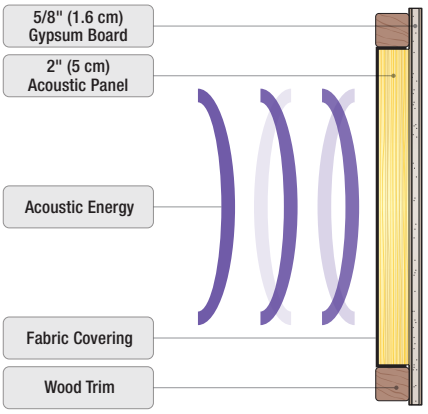
Overcoming Acoustical Challenges

A common reality, in the construction of live music venues, is that acoustical considerations are not addressed due to budget constraints or aesthetic demands. For example, interior design elements can take precedence over good acoustic principles, leading to reflective surfaces that conflict with the intended sonic character of the venue.

The most important functional objective for the saloon was to deliver very high quality sound with a low RT_{60} value for good tonal definition and intelligibility. Therefore, acoustical treatments needed to be accommodated within the interior styling. In the restaurant, acoustical considerations also were very important, to create a sonically well-controlled environment where patrons can always converse normally and comfortably with each other, even when the restaurant is busy.

The perimeter walls around the saloon and many of the walls in the restaurant were treated with semi-rigid, 2 inch (5 cm) acoustic panels and covered with acoustically transparent fabric. The walls surrounding the sunken dance floor were acoustically treated with 1 inch (2.5 cm) semi-rigid panels behind 1 inch rigid panels for protection against accidental bumping. These panels limit the "bouncing" of sonic waves off hard surfaces that lead to unwanted reverberations and a degradation of the overall sound quality in the saloon. In the restaurant, the panels significantly reduce the hard surface reflections typical in many restaurants that lead to elevated ambient noise levels, making it difficult to have normal conversations.

The acoustic panels have an NRC - Noise Reduction Coefficient rating of 0.95, meaning they absorb 95% of the sound that comes into contact with the panel in the critical 250 Hz, 500 Hz, 1 kHz, and 2 kHz vocal ranges. While these panels are intended to help control reflections within the space, they also aid in reducing sound transmission between the saloon and restaurant.



Acoustic panels integrated into the interior design of THE RANCH contribute to the desired RT_{60} value of 0.8 seconds, by absorbing up to 95% of sound waves in the vocal frequency range.

at Monitor World out to several locations on the stage, as well as the FOH console area. This provides a ready-to-go interconnection infrastructure for bringing in production equipment, placing it anywhere on-stage or in the audience to meet touring riders with specific audio or video connectivity needs.

"A prominent engineer for a televised awards program evaluated what we were doing with the infrastructure design," Fish says. "His verdict was, 'This is perfect! There is everything we need to have a production here.'"

Creating a High Performance, Credible Live Sound Reinforcement System Design

Andrew had envisioned THE RANCH as the benchmark venue for local artists, as well as the destination in the region for top country performers seeking an appealing, more intimate alternative to the large arenas, stadiums, and performing arts centers. Therefore, the mandate to John Fish was straightforward: go for "the best" in performance and quality when selecting equipment for the live performance system, to make it capable of meeting the typical requirements in riders for these top touring acts. "The system is being designed far beyond what would be expected in a normal club, simply because of the need to be able to attract top-level performers," Fish says.

Despite the mandate to specify "the best" equipment, designing a live sound reinforcement system that meets the typical riders for top touring acts can be challenging in many ways. Sound engineers for high-level acts may be particular about the brand and model of certain gear they'll want to use, such as the mixing console or microphones. Therefore, bringing in the best from a specific manufacturer may be good for one artist but not preferable for another. Another challenge is that many products right-sized for a small club venue, such as speakers, may not be rider-friendly. Speakers acceptable to touring acts typically are large vertical arrays designed for much larger venues than a club. "Bringing arrays into a small club environment is an interesting challenge for sound design, because they're really for big spaces," Fish says.

Fish's system design begins with 76 total available microphone connections on-stage, from floor boxes and wall panels. These connections are homerun to patch panels in the racks in Monitor World. From there, 48 mic lines are available for patching into a custom Ramtech stage box that provides two direct outputs and two Jensen transformer-isolated outputs. The direct outputs go to remote mic preamps, and directly to the FOH console as an analog backup. The isolated outputs are for monitoring and for video broadcast production trucks. The monitoring outputs go to a Yamaha M7CL 48-channel digital mixing console, where the mic channels are mixed, processed, and then output to the monitor system. A Yamaha DME 64N DSP digital mixer further processes and optimizes the audio for eight stereo wireless in-ear monitor systems, and a variety of Meyer Sound stage monitor speakers including the UM-1P and UM-100P, and the UMS-1P subwoofer.

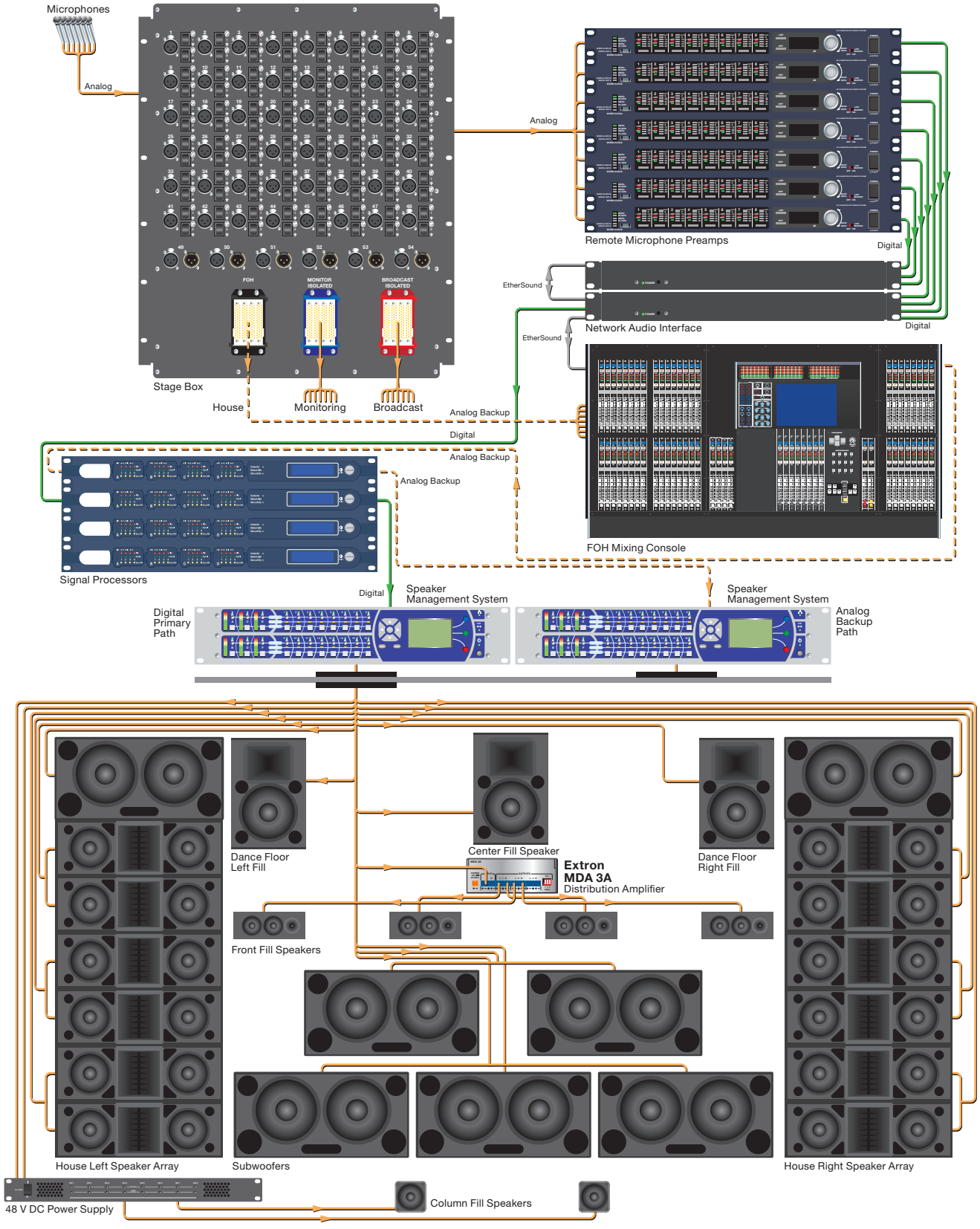
Front-of-House Console

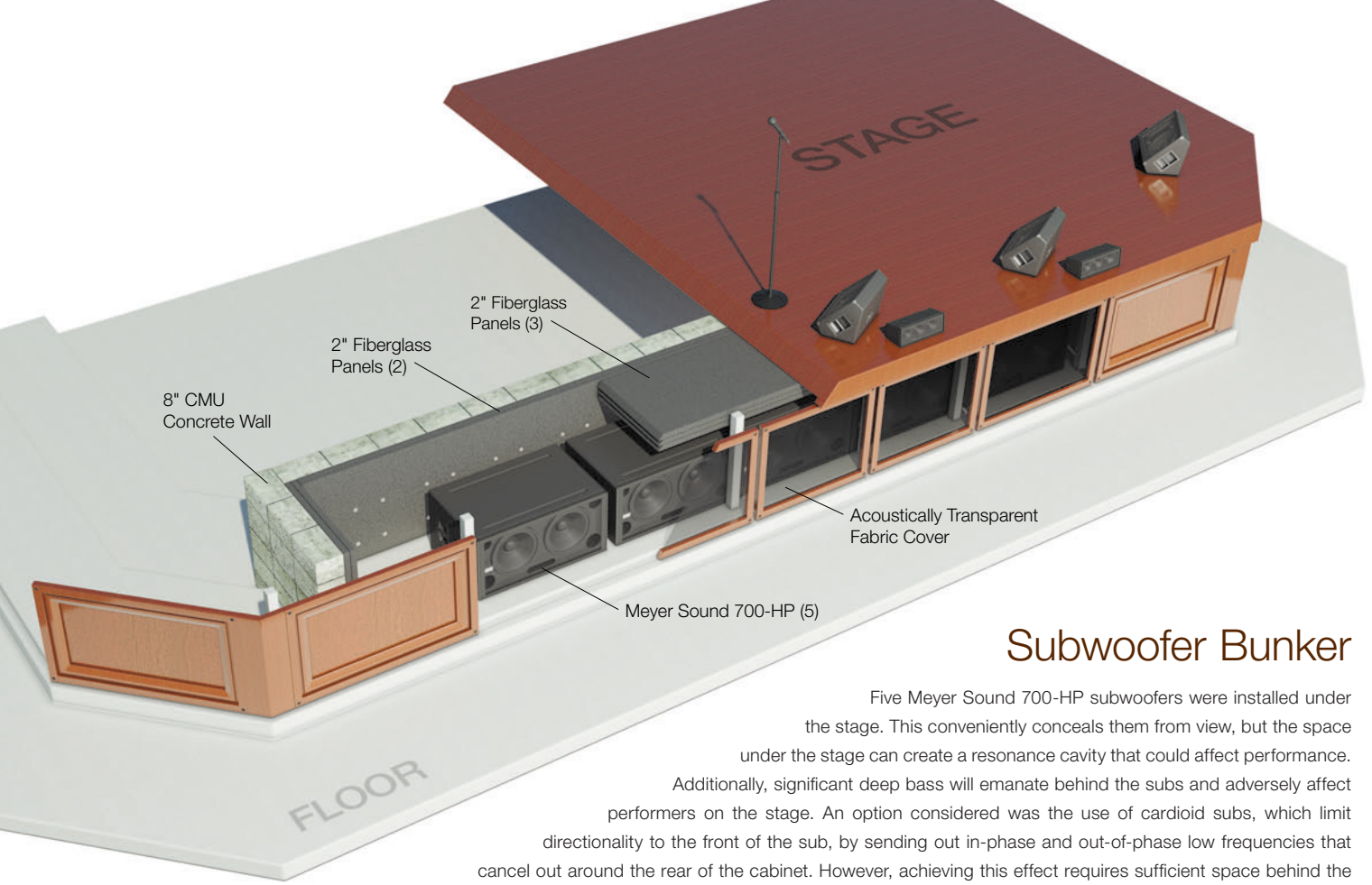
The mic channels that passed though the Ramtech stage box are routed to seven Yamaha AD8HR high performance mic preamps. The AD8HR preamps feature the same well-renowned microphone preamplifier circuitry in Yamaha's flagship PM5000 analog mixing console. Here, the mic signals are converted to 48 kHz/24-bit digital audio, and then the AES/EBU digital audio channels are converted to EtherSound through Yamaha NAI48-ES network audio interfaces. The result is a single STP network cable that carries all the mic channels over to the FOH area, and into a second Yamaha M7CL digital mixing console.

The performance of the FOH mixing console plays a very important role in the quality of the sound mix for the main left and right stage speakers, and therefore the overall performance of the live sound reinforcement system. FOH engineers working with top-level artists generally demand top-quality consoles. Since "the best" was needed for THE RANCH, a high-end digital mixing console was certainly under consideration. But the reality with mixing consoles is that at the upper-tier of FOH engineers working for top-level touring acts, there tend to be individual preferences. Choosing a specific model could mean that one top-level act might embrace it, while another may not want to work with it at all.

The Yamaha PM5D was among the top-tier consoles being considered for THE RANCH. This console and the smaller M7CL are very popular with FOH engineers. It was ultimately decided that instead of choosing the higher-end touring console, the M7CL would be a better fit for the saloon because of its wide appeal and accessibility to FOH engineers working with a range of bands, including local, mid-level, and also top-tier acts that happen to

Saloon Performance Audio System





Subwoofer Bunker

Five Meyer Sound 700-HP subwoofers were installed under the stage. This conveniently conceals them from view, but the space under the stage can create a resonance cavity that could affect performance. Additionally, significant deep bass will emanate behind the subs and adversely affect performers on the stage. An option considered was the use of cardioid subs, which limit directionality to the front of the sub, by sending out in-phase and out-of-phase low frequencies that cancel out around the rear of the cabinet. However, achieving this effect requires sufficient space behind the subs, and the performers would be too close to them. The solution was to construct a special "bunker" under the stage to enclose the subwoofer array. The fiberglass panels and the cement walls act to block low frequencies coming out from behind or above the subwoofers, effectively "pushing out" all of the deep bass from the front of the subwoofer array and into the room.

be using the PM5D console. Furthermore, many acts can bring in their M7CL settings on a USB flash drive and plug it right into the saloon's console, and top-level performers can have their PM5D settings translated for use on the M7CL. For performing acts wanting high-end consoles, THE RANCH can simply rent a specific model for the show.

"Although we easily could have had a top-end console, the fact that everyone will work with the M7CL made it the obvious choice for us," Fish says. "We'll bring in whatever is needed for the big acts, even a legacy analog console if that's what they want."

Audio Signal Management and DSP

The resulting "house mix" coming out of the M7CL console travels back over EtherSound to Monitor World, where it is converted to AES/EBU and then sent to a system of five BSS Audio Soundweb London digital audio processors. These DSPs process the house mix, as well as audio from the DJ and AV systems. They then provide centralized routing and management of audio signals to the main stage left and right speakers, the subwoofers, and the many other speakers throughout the saloon. As Fish describes it, "The DSPs act as the traffic cop for all of the audio in the saloon."

The Soundweb London DSPs together provide total I/O capacity for up to 32 digital input channels, 20 analog input channels, 12 digital output channels, and 32 analog output channels. There are digital audio links to and from the restaurant, to facilitate expansion of restaurant operations into the saloon, or bringing live concert sound into the restaurant dining rooms.

Meyer Sound Speaker Line Arrays

As with the FOH console, the performance of the main left and right speakers is critical in defining the quality of the live sound reinforcement system. Meyer Sound is a particularly well-respected brand for live sound reinforcement. Andrew had fostered a very close relationship with Helen and John Meyer, and as a result, they agreed to provide close guidance and support throughout the system design, installation, and commissioning, using the resources and talent of the Meyer Sound engineering team.

When evaluating the ideal speakers to provide sufficient coverage for the size of the saloon, Meyer engineers initially

suggested that a horizontal speaker cluster might be ideal for the left and right stage speakers. Each cluster would have speakers aimed toward the dance floor and speakers facing out to the side seating areas. But top-level acts for live sound generally use vertical speaker arrays for projecting sound in large venues. FOH engineers for touring acts are accustomed to mixing to vertical arrays, and they will typically be specified in riders. So the decision was made to go with vertical arrays for THE RANCH.

Fish selected Meyer Sound MICA speakers for the saloon sound system. A compact array of just six speakers on each side of the stage provides the right amount of dispersion needed to cover the size of the saloon. Smaller array speakers with somewhat more modest amp power could have been chosen for THE RANCH, but since the MICA was reasonably compact, and also familiar to touring acts alongside the MILO, its bigger brother, it turned out to be the best choice for meeting touring riders.

The substantial power output capability of the MICA arrays, though well beyond what was necessary, provides an important advantage in that the speakers will be driven far below their maximum capability, which allows the sound to be maintained at a very high quality level and well below distortion. Patrons at THE RANCH in turn will always be assured a comfortable, pleasurable listening experience without the sound from the stage blasting at them. "This is a critical advantage in meeting a very important mandate by Andrew to maintain moderate volume levels at all times, even during a full-blown concert," Fish says.

Meyer Sound Subwoofers

An ample quantity of subwoofers was needed to deliver clean, solid, undistorted deep bass, with a flat in-room response down to 20 Hz, at moderate levels well below distortion. But in a club setting, finding the space to place them can be difficult. Stacking them vertically on-stage yields an ideal cylindrical distribution pattern for the room, but this method takes up considerable space and performers do not like being in close proximity to them.

The subwoofer bunker during construction

To meet this challenge, a subwoofer array of five Meyer Sound 700-HP subwoofers, each with two 18 inch (45 cm) drivers, is enclosed in an acoustic "bunker" under the stage to contain bass energy and direct it outward, while preserving the visual appeal of the stage. See the "Subwoofer Bunker" sidebar for additional information. Subtle time delays of 1 ms and 3 ms were added to the inner and outer subwoofer pairs, respectively, to help "spread" the bass outward from the five-sub array.

While the five double-18 inch subwoofers certainly deliver very clean, tight bass at notable sound pressure levels, the amount of low frequencies may be too much for anyone close to the stage, particularly when the dance floor is used for theater or table-style seating during special events. An additional Meyer Sound 600-HP twin 15-inch (38 cm) subwoofer was flown above each MICA speaker array, allowing some of the low-end to be directed to them instead of the under-stage subs. "Having the 600-HPs will allow us to steer some of the bass away from the dance floor to minimize exposure for audience members seated there," Fish explains. "The additional subs will also give us extra flexibility to support other applications."

Additional Meyer Sound Speakers

Audience members or dancers very close to the stage will be out of the ideal coverage pattern of the main speakers. To compensate, Fish selected four Meyer Sound UPM-1P compact profile speakers to provide front fill for those close to the stage. In addition, Fish provided center fill from a Meyer Sound UPQ-1P speaker, flown above the stage in between the MICA arrays. This was for dancers or a segment of the audience around the center of the dance floor, where they would be just beyond the ideal dispersion pattern of the arrays.

Above: Custom black-painted Extron SI 26CT speakers were used overhead in the bar areas to ensure high bandwidth music delivery and even coverage throughout. **Right:** Custom Extron SI 28 speakers were mounted in the trellis over the audience areas using custom mounting brackets fabricated in-house.

Certain areas to the left and right of the dance floor may be blocked from the main speaker arrays by columns. Fish had a Meyer Sound MM-4XP speaker attached to the rear side of each column to help project sound from the arrays to those areas. The speakers are remotely powered by an MPS-488HP 48 V power supply.

All of the Meyer Sound speakers are set up and optimized with the Meyer Sound Galileo DSP processor. The Galileo provides dedicated calibration and DSP adjustments for each individual speaker model, including parametric EQ, delay, matrix mixing, and filtering.

Extron Speakers for the Perimeter Areas

The Meyer Sound speakers provide excellent coverage for areas within and bordering the dance floor. However, many of the seating areas are beyond the ideal reach of these speakers. This could be addressed by turning up the volume of the stage speakers. But then the sound can become very loud and uncomfortable for those near the stage. One of the most important objectives for the sound system was very good distribution of sound everywhere, with the sound in the room seeming loud when appropriate, but not actually loud to the point of patron discomfort.

What Fish needed to do was take the sound from the stage arrays and "project" it into the outer areas beyond the dance floor. The original design solution was to add an exploded delay cluster with the speakers spread around the perimeter of the dance floor, each suspended from the ceiling. But when Andrew decided that a cedar beam trellis would be added to the interior design, this solution would not be practical. Fish then decided to take advantage of the trellis and design a 70 volt speaker distribution system using black Extron SI 28 two-way surface mount speakers mounted to the beams, firing straight downward. The speakers were modified with high quality Altec transformers that the Extron engineering team found to be a very good match for the SI 28. The SI 28s were also used in conjunction with a series of transformer-modified Extron SI 28W two-way in-wall speakers mounted into the ceiling, in an audience area that extends beyond the trellis.

A total of 35 SI 28 and seven SI 28W speakers were installed, effectively forming a "constellation" of downward-firing speakers to fully envelop the seating areas around the dance floor. Custom mounts were made at Extron to allow the SI 28s to be side-mounted to the trellis beams. These speakers were powered by Extron XPA 2002-70V two channel 400 watt, ENERGY STAR qualified amplifiers. There are 11 speaker zones in the trellis seating areas, all with precise delay mapping and blend from the house left/right mix. There are an additional eight zones that cover both bars, the lobby, smoking patio, and restrooms. This high density of speakers for 70 volt distribution allows optimal projection of sound from the stage without having to greatly increase the volume, which in turn keeps the speakers operating with plenty of headroom to maintain consistent audio quality. As Fish summarizes it, the speaker constellation "supports the main stage speakers by spreading the sound all around to ensure even, comfortable listening levels during concerts, on DJ nights, or when a local band is playing."

Totally Failsafe System Operation

The design for the live sound reinforcement system needed to include sufficient measures to ensure that a concert event continues uninterrupted in the event of any problems in the system. Fish fulfilled this requirement by creating fully redundant digital and analog audio paths, from the microphones to the speakers. This approach to system design is significantly beyond the norm

for live performance venues, and is often considered redundant or costly. But for THE RANCH, it was an important aspect of its priority to maximize customer satisfaction.

Analog XLR lines from the stage box run parallel to the EtherSound going to the FOH console. Redundant digital and analog paths were also provided out of the FOH console and over to the DSPs. Fish built additional redundancy into the system by having the digital and analog console feeds going into two separate DSPs, which send out duplicate AES/EBU and analog XLR signals, each to its own Meyer Sound Galileo DSP that optimizes the audio for the Meyer Sound speakers. See the diagram on page 29. Several physical and logical access points were made available throughout the signal chains for switching over to analog.

"In the end, we have provided an analog backup for the entire digital audio chain," Fish says. "This is very unusual in live sound systems, but for us it will absolutely ensure that 'the show must go on,' no matter what may happen."

DJ System

An alcove at stage left serves as a booth for the DJ, and for housing the DJ system. This system includes two Pioneer multi-format audio players for CDs and music files and the DJ's laptop that serve as the primary music sources. The audio players are input into a Rane Serato scratch processor. The audio outputs from the Rane Serato and the laptop are fed into a Pioneer DJ mixer. Two wireless microphone systems are also connected into the DJ mixer, for use by the DJ and the dance instructor.

S/PDIF digital audio output from the DJ mixer is sent to the Soundweb London DSPs and ultimately to the Meyer Sound and Extron speakers. As with the live sound reinforcement system, a secondary analog stereo output from the DJ mixer serves as a backup to ensure full system reliability.

Two Meyer Sound UPQ-1P speakers, installed above the rear of the dance floor, provide back fill for the DJ. These are also used as surround speakers when the system is used in a surround sound application. Additionally, there are two Extron SI 28W speakers installed on the ceiling in the DJ booth, and fed from the DJ mixer via an Extron XPA 2002 two channel 400 watt power amplifier.

The sound system is fully capable of revealing the artifacts and limitations inherent in compressed music files that DJs use when playing back from their laptops. Therefore, Andrew insisted that all music tracks must be uncompressed, sourced from CDs, to ensure the highest sound quality. A dedicated, large capacity media server will eventually house a comprehensive library of WAV files sourced from THE RANCH's growing collection of country music on CDs, and serve as the primary music source for the DJ system.

The saloon AV system in the DJ booth features an Extron DVS 510 scaling presentation switcher, an SMX 300 modular matrix switcher with SMX 88 HDMI boards, a MAV Plus 168 AV matrix switcher, and a PowerCage 1600 enclosure designated for future system expansion.

System Fine-Tuning and Optimization

Fish performed a detailed system calibration procedure for the Meyer Sound speakers, particularly the MICA arrays that included frequency response optimization for individual speakers in the array, based on spatial averaging from several locations in the room. As a result of this detailed fine-tuning, he was able to have the arrays perform their very best by delivering accurate sonic detail and creating a wide, cohesive stereo image. This allows an FOH engineer to create a true stereo mix, which is beyond the norm for typical performance venues. According to Fish, "The engineer can actually pan vocals and instruments according to their locations on-stage."

Fish also optimized all of the Extron distributed speakers in the saloon with DSP processing to fully complement the MICA arrays, dividing up the speakers into 19 zones, and then applying the appropriate amount of delay and blend from the left and right arrays into them. "The Extron speakers work together with the main speakers to give presence from the stage, even when you're well away from the dance floor," he says. "You really can't tell they're there unless someone shuts them off."

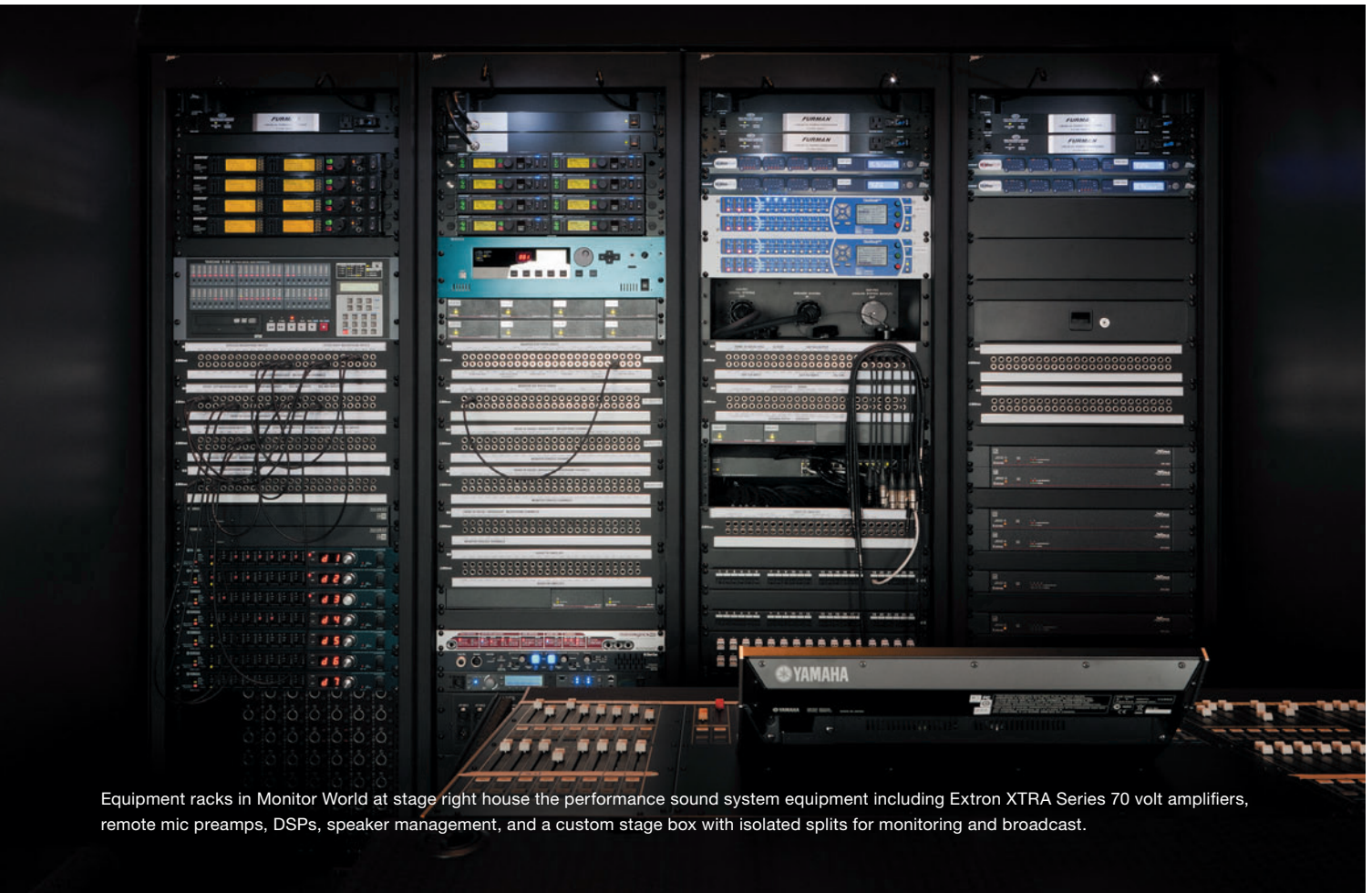
Comprehensive AV System

The saloon includes a fully equipped AV system that serves a variety of applications, from watching TV at the bars, to supporting the main sound reinforcement system by sending DJ or concert sound to areas including the restrooms, backstage, bars, and patio. The system design accommodates numerous source devices and displays as well as local AV hookups, plus plenty of I/O capacity to support future additions or applications.

Video

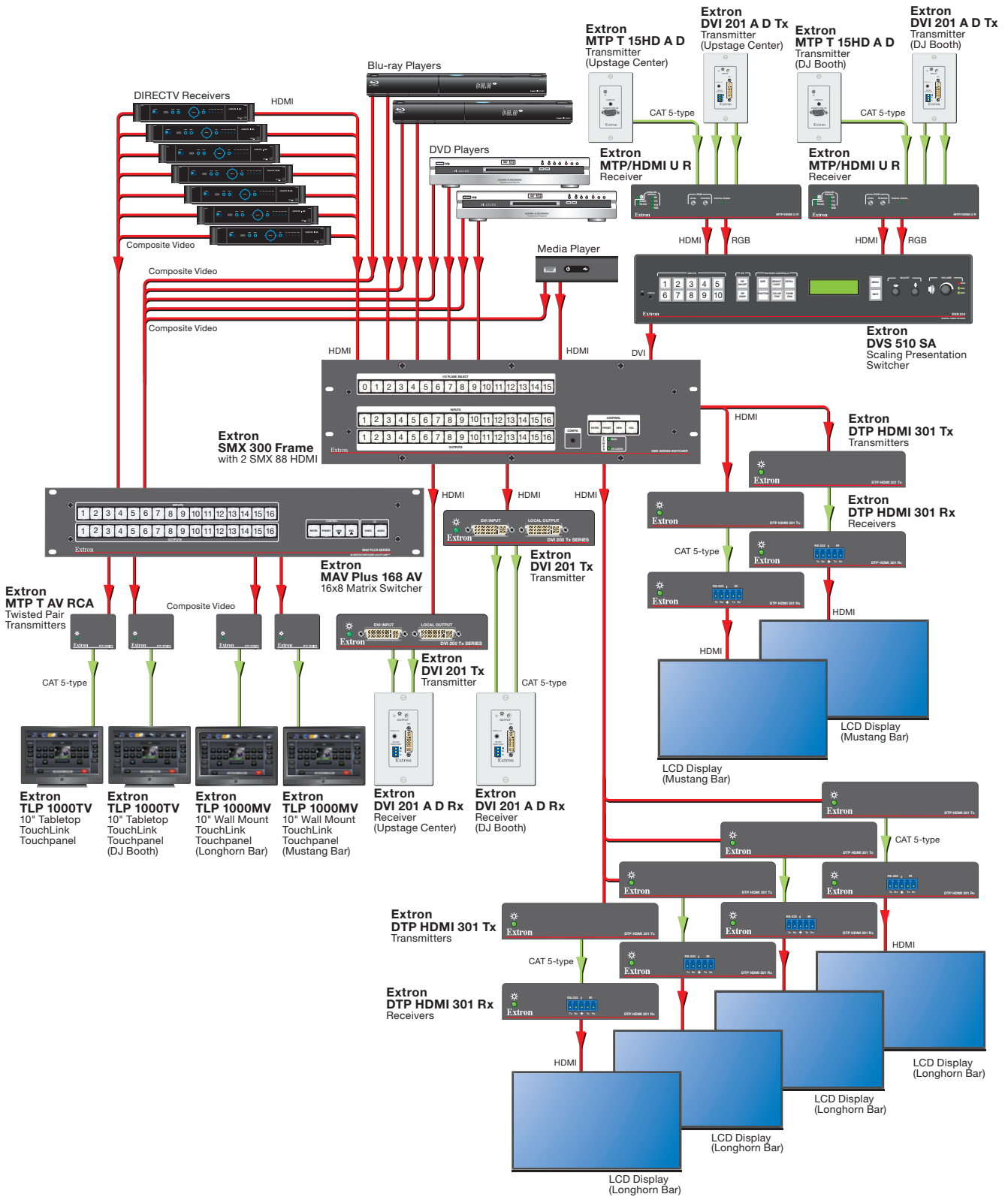
The AV system, housed in the DJ booth, provides distribution of video to six 52 inch (132 cm) Sharp LCD displays at the bars. The AV sources are primarily seven DirecTV HD tuners but also include Blu-ray Disc and DVD players, a network media player, and a triple-iPod/iPhone dock. Apart from the iPod dock, these sources output HDMI at HDTV 1080p to an Extron SMX 300 System MultiMatrix modular matrix switcher, with two SMX 88 HDMI boards daisy-chained. The HDMI outputs are then transmitted over twisted pair to the six LCD displays, using Extron DTP HDMI 301 long distance extenders.

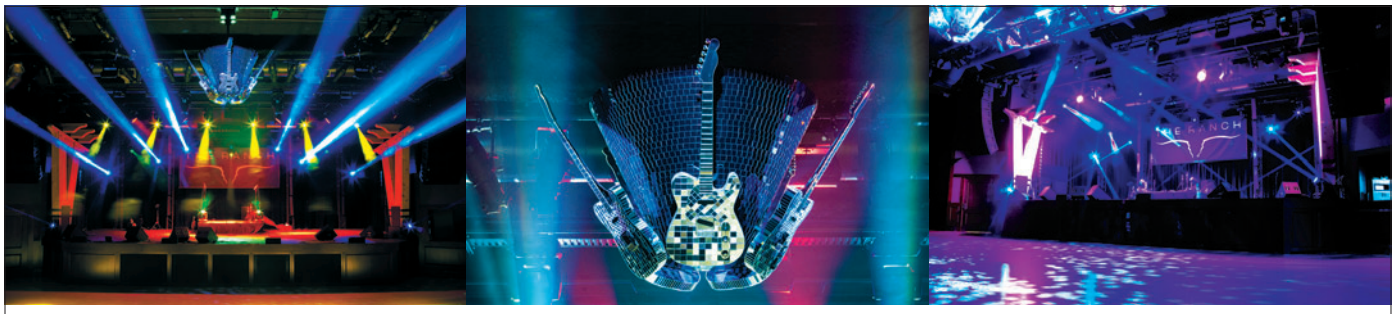
The AV system also provides parallel composite video signal routing from the sources, so they can be previewed on Extron TouchLink touchpanels throughout the saloon. Composite video outputs from the AV sources feed into an Extron MAV Plus 168 AV matrix switcher, and its outputs are transmitted to the touchpanels via Extron MTP T AV RCA twisted pair transmitters.



Equipment racks in Monitor World at stage right house the performance sound system equipment including Extron XTRA Series 70 volt amplifiers, remote mic preamps, DSPs, speaker management, and a custom stage box with isolated splits for monitoring and broadcast.

Saloon AV Video System





Stage Lighting for THE RANCH

The saloon features a comprehensive stage lighting system to provide a wide variety of lighting scenes and visual effects for feature concert acts. It is also used to set the lighting ambiance on DJ nights or when a local band is performing. The system was designed and integrated by All Stage Pro in Santa Ana, CA, and features a total of 83 lighting fixtures, the majority of which are LED-based for significant electrical infrastructure and cost benefits compared to incandescent or arc lamps. In addition to lower energy usage, fewer electrical circuits are required for installing LED light fixtures. "We have been encouraging the use of LED lighting to our customers, so they can benefit from significant cost savings and be more green," says Ian Ingram, Principal of All Stage Pro.

The stage lighting system includes a combination of wash lights, ellipsoidals, and moving lights rigged to battens over the stage and dance floor. Additional lights, including LED striplights and bars, are mounted to trusses at the back and sides of the stage.

At the FOH console station, a Road Hog lighting console from High End Systems provides centralized control of the lighting system through DMX512, an industry standard protocol for theatrical lighting control. In addition to the Road Hog, there is also a virtual console on a PC, which serves as a backup for the primary console.

A noteworthy feature of the stage lighting is a custom rotating mirror ball, fashioned of five Fender Telecaster guitar replicas mounted to a center cone. Full-size replicas were created from an actual Telecaster provided by Fender. Each guitar is fully adorned with mirrors, as well as actual Fender hardware. The center cone is covered with dark mirrors to add an extra dimension to the glittering effect.

During the planning stages, Ingram worked closely with Andrew, presenting 3D simulations through software modeling of the stage and lighting system. "Andrew asked me to come up with something that he could be proud of," says Ingram, a 20-year veteran of professional lighting and sound with over 400 installations to his credit. "In the end, we came up with a great system that will always produce an amazing light show and make everyone say 'Wow!'"

Local AV Inputs and Outputs

There are also local AV source and display hookups available in the DJ booth and on the stage, with Extron DVI 201 A D Tx and MTP T 15HD A D Decora twisted pair transmitters, and DVI 201 A D Rx Decora twisted pair receivers installed in a four-gang junction box at both locations. The twisted pair DVI and analog VGA signals with audio go into two Extron MTP/HDMI U R receivers in the DJ booth, whose outputs then feed directly into an Extron DVS 510 ten input scaler and switcher. The DVS 510 provides video signal processing and optimization, and then delivers DVI output at HDTV 1080p to the SMX 300. Two of the HDMI outputs of the SMX 300 are sent over Extron DVI 201 Tx twisted pair transmitters to the DVI 201 A D Rx receivers on the stage and in the DJ booth. There are additional video paths from the saloon AV system to the AV systems in the restaurant, so that events in the saloon can be routed to private parties in The Porch or The Carolina Room.

Audio

In addition to distributing video to the LCD TVs, the AV system also provides audio distribution from the AV sources to the BSS Audio Soundweb London DSPs, which then route the audio to the speakers. The audio for the DSPs comes from an HDMI output of the Extron SMX 300, which is fed into an Extron HAE 100 that extracts the embedded HDMI audio as S/PDIF digital audio.

The AV sources also provide analog stereo audio output into the Extron MAV Plus 168 AV. An audio output from this matrix switcher then goes into the DSPs. This serves as a backup audio path to the Soundweb London DSPs, similar to the redundancy built into the live sound reinforcement and DJ systems.

In addition to the "constellation" of Extron SI 28 and SI 28W speakers around the dance floor, there are many other Extron speakers installed throughout, including 36 Extron SI 26CT ceiling speakers at the two bars for patrons to watch TV. A few Extron SI 26X speakers were substituted in a few locations where unexpected obstructions above the ceiling were discovered. These speakers were modified with 70 volt transformers. SI 26CT speakers were also installed in the lobby, restrooms, and backstage areas. A pair of weatherproof speakers was used for the patio. In total, 87 Extron speakers were installed in the saloon.

Ten Extron XPA 2002-70V two channel ENERGY STAR qualified power amplifiers, in the rack at Monitor World, deliver 200 watts rms power per channel to the Extron speakers in the saloon. The amplifiers deliver plenty of headroom for the system to ensure clear, optimal sound quality. Extron 70 volt power amplifiers were selected because of their high energy efficiency, compact size, and

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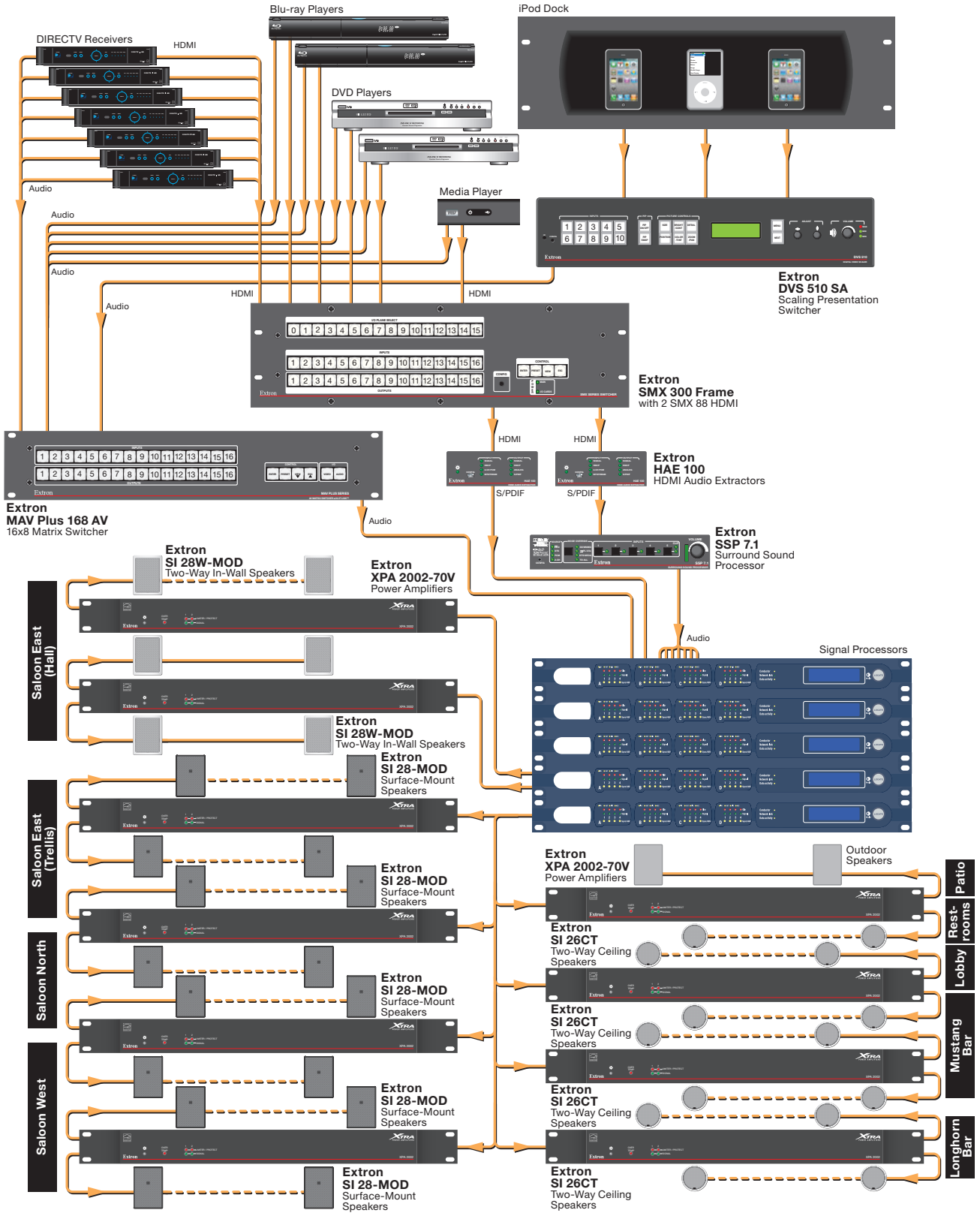
Saloon AV Audio System



their transformerless amplifier designs that deliver significantly better audio performance over typical high impedance amplifiers with step-up transformers. “Extron 70 volt amplifiers certainly were an appealing choice for their low power consumption, but a big plus was the fact that they don’t use transformers, which can be a limitation on audio quality,” Fish says.

Integrating Traditionally Distinct Systems for Centralized System Control

Bringing together AV, audio DSP, lighting, and the HVAC systems into a single touchscreen control interface would be a significant challenge. For THE RANCH, the large quantity and wide variety of devices, and the range of controls and functions required called for system design, integration, and configuration on a scale reserved for the most complex AV projects. The control system design necessitated interfacing with the HVAC systems using BACnet, an industry standard control protocol for building automation.

From the beginning, it was determined that the project should leverage the technologies within the Extron IP Link control processor and TouchLink touchpanel families. THE RANCH presented an opportunity for Extron to match the requirements of an upscale entertainment venue with evolving Extron control system technology. The result is an Extron control system solution that allows access to multiple AV and environmental system controls from a single touchpanel control interface, making it quick and easy for authorized staff to apply system adjustments without having to work with separate AV, lighting, or thermostat controls at different locations.

Several Extron system control products were used for THE RANCH, including the following:

- Four Extron IPCP 505 IP Link control processors, two in the saloon and two in the restaurant for controlling AV sources, Extron scaling and switching devices, displays, and the BSS Audio Soundweb London DSPs. An additional IPCP 505 is available for controlling future equipment added to the saloon.
- An Extron IPL 250 IP Link control processor for The Carolina Room in the restaurant, dedicated to the local AV presentation system.
- Six Extron TLP 1000TV tabletop TouchLink touchpanels at the restaurant and saloon host stations, FOH, DJ booth, The Carolina Room, and Andrew’s VIP booth in the saloon.
- Four Extron TLP 1000MV wall-mounted TouchLink touchpanels for the Longhorn and Mustang bars in the saloon, the manager’s office, and The Porch in the restaurant.
- An iPad with the TouchLink for iPad app.

The following summarizes the various system control capabilities available at THE RANCH, using a mix of Extron products and technologies. System control access varies according to location and the staff member operating the controls.

HVAC Automation

There are 36 temperature sensor locations throughout the restaurant and saloon. At select locations, the Extron TouchLink touchpanel GUI includes a separate floor plan for each facility, showing the locations of the sensors and their current temperature readings. THE RANCH management has the authorization to change climate control set points at 33 of these sensor locations, including the dance floor, bars, stage, and each dining area of the restaurant. On the dance floor, there are sensors at three different heights – 5, 10, and 15 feet (1.5, 3, and 4.5 meters), a further testament of Andrew’s particular dedication to ensuring patron comfort while dancing.

Lighting Scenes

All ambient lighting in the restaurant and saloon is managed by Extron TouchLink to control the Lutron Quantum lighting control systems. Lighting scenes are recalled by authorized staff operating the Extron control systems. Individual dimming adjustments are available to further fine-tune specific lighting scenes or areas. For example, house lights are dimmed prior to performances in the saloon, using presets at the FOH or DJ booth touchpanels.

Saloon AV System

Wall-mounted Extron TouchLink touchpanels at the Longhorn and Mustang bars allow bartenders and service staff to change TV channels on individual displays. They can also set the volume

The architectural lighting for THE RANCH establishes an appealing, welcoming ambiance for guests. **Right (top and bottom):** The restaurant and saloon each have a dedicated Lutron Quantum lighting control system with a series of Lutron LP dimming panels.

Architectural Lighting with Lutron Systems

Architectural lighting is a very important element of the interior design for an entertainment venue. It defines the overall ambiance and visual character of the environment, while at the same time accenting key aesthetic elements of the interior design. THE RANCH features a total of about 500 accent lighting fixtures throughout the restaurant and saloon, including spotlights, pin-spot downlights, chandeliers, sconces, cove lighting, and recessed lights. The architectural lighting for THE RANCH establishes the engaging, welcoming atmosphere that Andrew desires to bring to his guests every evening.

The lighting fixtures were integrated into a centralized lighting management system with intuitive user controls. The Lutron Quantum lighting control system was selected for THE RANCH, comprising a Quantum processor and a series of Lutron LP dimming panels. Quantum, the newest and the most advanced of Lutron's centralized lighting automation technology, met the requirements for managing all lighting in THE RANCH. Andrew mandated separate Quantum systems for the restaurant and the saloon, allowing each system to operate independently and ensure full reliability.

The 500 fixtures were wired into groups, called zones, based on type and location. There are 75 zones for the restaurant and 57 for the saloon. Each Quantum system was configured using Lutron Q-Design software to arrange these zones by physical areas, such as the Longhorn bar in the saloon, or one of the dining rooms in the restaurant. The systems were then programmed and commissioned using Lutron Q-Admin software, to create a series of lighting scenes that deliver preset dimming levels for each zone within an area. Various lighting scenes are used daily at THE RANCH, such as for late afternoon or early evening, or after sunset.

Authorized staff at THE RANCH can engage lighting scenes and adjust levels in individual areas through wall-mounted Lutron seeTouch QS button panels. Lighting presets and dimming levels can also be accessed through Extron TouchLink touchpanels and the Extron control system solution that communicates with the Quantum processors. The Carolina Room in the restaurant features a dedicated GRAFIK Eye QS controller that provides local scene programming and lighting control capabilities.

Lutron lighting systems were also installed throughout the new Extron corporate headquarters building in Anaheim as well as the new Extron building in Raleigh, NC. The systems feature occupancy sensors and astronomic timeclocks to optimize energy conservation, as well as Lutron EcoSystem digitally addressable ballasts. Many of the systems were also integrated with the HVAC systems to automatically adjust thermostats in unoccupied areas.

Lutron XPS systems control essential lighting for the core and shell of each building, including the main lobby and central hallways. Conference rooms on each floor feature Lutron GRAFIK Eye QS lighting control to provide scenes for meetings, videoconference sessions, and AV presentations. GRAFIK Eye QS is also used in the Extron Institute training centers with lighting scenes for instructor-led or group-based training sessions, as well as video recording. Lighting scenes and levels can be accessed through the GRAFIK Eye QS panels, wall-mounted seeTouch QS panels, or Extron TouchLink touchpanels.

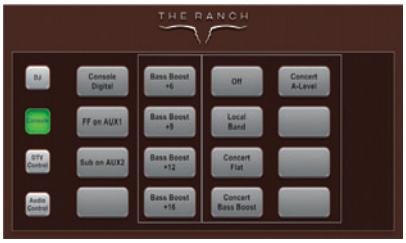
The lighting for individual offices and open office spaces are regulated using Lutron Energi Savr Nodes connected to seeTouch wall panels and occupancy sensors in each space. Each individual office and conference room in the building features Lutron Sivoia QS shading systems. Sivoia QS shades in the conference rooms are motorized and integrated into the GRAFIK Eye QS systems.

Ten Extron 10 inch (25 cm) TouchLink touchpanels are used throughout THE RANCH. At the bars, servers can independently select channels for each of the six displays.

Extron TouchLink GUI Interfaces

Several touchpanel interfaces were created for Extron TouchLink TLP 1000MV and TLP 1000TV touchpanels at THE RANCH to provide intuitive AV, audio DSP, lighting, and HVAC control. Dedicated GUI designs were created for specific locations throughout, each with its own set of controls based on the intended application and degree of system access for the staff. For example, servers at the bars are able to select channels for the TVs and adjust volume levels, while the FOH engineer has the ability to set the sound system to specific concert presentation modes. Management has master control of all systems from their touchpanels, including the capability to monitor and adjust temperatures throughout the saloon and restaurant.

HVAC: 36 HVAC sensors in THE RANCH can be monitored from a custom GUI, which provides controls for the HVAC system.



DSP: TLP 1000TV touchpanels at the FOH and DJ booth allow DSP settings for concert and music playback modes to be selected.

AV: In The Porch dining room, the AV system is controlled via a TLP 1000MV touchpanel.

level and select the TV channel for the ceiling speakers at each bar, bring up the channel guide, and power the TVs off or on.

Restaurant AV System

The host has the ability to select the input source for background music, and adjust volume levels in individual areas such as the dining rooms. Dedicated Extron TouchLink touchpanels are provided for local AV systems in The Carolina Room and The Porch for selecting and operating input sources, controlling the displays, adjusting volume level, and selecting background music or one of the local sources for the speakers. The controls also allow lighting scene selection and setting the room temperature. In The Porch, the user can also drop down or retract the projection screen.

DJ System

The tabletop Extron TouchLink touchpanel in the DJ booth provides access to a series of audio DSP presets to switch between various DJ presentation modes that focus the audio toward the dance floor, spread the audio around the room, or bring the system into an "all-out" mode with the subs and main speaker arrays cranked up. The DJ can also control the TVs and adjust volume levels at the bars. A potentially important function for the DJ is the ability to engage analog backup audio for the DJ and AV systems.

FOH

The Extron TouchLink tabletop touchpanel at the FOH console provides a series of audio DSP presets to engage various concert modes for the system, with predetermined levels for the main speaker arrays and subs. The presets also allow for control of the audio content going to the front fill speakers and the subwoofers. The FOH engineer can use the touchpanel to initiate analog audio backup in the event of a system failure, and assist the DJ by recalling DSP presets for the DJ system.

Master System Control

THE RANCH management, including Andrew, has master control of all systems including HVAC, the sound system, and lighting functions in both the restaurant and saloon. There is also the ability

Above: The Carolina Room features a dedicated AV system with a 70-inch (178 cm) LCD monitor and Extron SI 26X speakers. **Right (top):** The Porch features its own AV system with a DLP projector and Extron SI 26 speakers. **Right (bottom):** The restaurant AV systems utilize ENERGY STAR qualified Extron amplifiers for their performance and efficiency.

Restaurant AV Systems

The restaurant has three AV systems that serve its own requirements distinct from the saloon. The primary system supplies background music to all areas including the lobby, bar, two dining rooms, The Carolina Room for up to 14 private dining guests, The Porch interior and exterior patios for up to 50 guests, the restrooms, and even the kitchen. The Carolina Room and The Porch have dedicated AV systems for clients to deliver multimedia presentations.

Background Music System

The background music system is tucked away behind custom millwork recessed into the wall. It features several background music sources, including a triple-iPod/iPhone dock, a CD changer, and a network media player. They go into a system of three BSS Audio Soundweb London DSPs dedicated to providing audio signal processing, management, and routing to designated speaker zones throughout the restaurant. Sense microphones, installed in several areas, are used by the DSPs to detect ambient noise levels in individual zones, and then compensate with subtle volume adjustments. There are digital audio links to and from the saloon sound system.

The outputs from the DSPs feed into a series of Extron ENERGY STAR qualified amplifiers, including six XPA 2002-70V two channel power amplifiers, two MPA 401-70V mono amplifiers, and an XPA 2001-70V mono amplifier. The XPA 2002-70Vs provide 200 watts rms power per channel, more than ample headroom to power speakers in individual zones. The other amplifiers provide 40 watts and 100 watts rms for smaller speaker zones in the kitchen and restroom.

Extron ENERGY STAR qualified 70 volt amplifiers were selected for their high quality audio performance as well as their energy and space efficiency. They are convection cooled and generate very little heat, allowing them to be situated close together and directly adjacent to other AV devices, an important benefit given the limited space available in the rack. The two MPA 401-70V amplifiers and XPA 2001-70V together occupy just a single rack unit of space.

A total of 61 Extron SI 26 surface mount speakers are installed in the restaurant, all modified with 70 volt transformers. Most are side-mounted using custom brackets to cedar beam trusses bracing the vaulted ceilings. Others are installed above custom coffered ceilings to a Unistrut support system via Extron V-Lock mounts. Elsewhere in the restaurant, there are several Extron SI 26CT and SI 26X ceiling speakers, and weatherproof speakers for the outdoor patio and entrance areas. In total, 86 Extron speakers are installed throughout the restaurant.

As in the saloon, the aim of the distributed sound system design was to create a high density or “constellation” of speakers with plenty of headroom from the amplifiers. This provides even distribution of high quality sound to everyone at moderate volume levels.

Presentation AV Systems

The equipment for The Carolina Room is housed in a small rack within the custom cabinetry, while the system for The Porch is situated in the background music system rack. Both are identically configured with a DirecTV HD tuner, a Blu-ray Disc player, and digital and analog AV connectivity through Extron MTP/HDMI U T A D Decora twisted pair transmitters on the wall and in a floor box. They are paired with MTP/HDMI U R twisted pair receivers that go into an Extron DVS 510 ten input switcher and scaler. The DVI output from the DVS 510, together with the HDMI from the AV sources, are directed into an Extron SW4 HDMI four input HDMI switcher, whose output is then transmitted over to the display via an Extron DTP HDMI 301 twisted pair extender. The balanced stereo audio output from the DVS 510 goes to the Soundweb London DSPs in the background music system rack.

The Carolina Room features a 70-inch (178 cm) Sharp LCD flat-panel display recessed behind the custom woodwork, while an overhead-mounted Panasonic DLP WUXGA projector with a long-throw lens is installed in The Porch. Wall-mounted microphone connections are also available in The Porch, which are run to the background music system rack and input to the DSPs.

to monitor sound pressure levels in the saloon through microphones above the dance floor, adjust microphone levels for the DJ and dance instructor, and more. These controls provide the capability to quickly respond to any need for adjustments, but foremost, help ensure satisfaction for patrons at THE RANCH.

Power Management

In addition to master system controls, Andrew mandated the incorporation of active power management for the sound system and the AV systems in THE RANCH, so they can be remotely shut off every night to conserve energy. The Extron control system is programmed to automatically power down all of the rack systems in the saloon and restaurant after closing, as well as the FOH and Monitor World mixing consoles. The systems are automatically powered up again the following day, at specific times according to operating hours for the restaurant and saloon. Button controls are also available on the TouchLink GUI to turn individual systems on or off. Additionally, any system shut down will automatically be powered upon activation of a control function. Four Extron IPL T PC1 IP Link controllers for AC power and eight Furman Sound MINIPORT-20 remote power relay units were installed at the racks to power up and shut down systems.

A Successful Extron Control System Solution

The Extron control system interfaces with the Tridium Niagara-based network, via BACnet, to communicate with the building automation systems for HVAC. Using features derived from the upcoming release of Extron Global Configurator Professional, the control system groups several Extron IP Link control processors and control from 10 Extron TouchLink touchpanel locations. Conditional logic allows for communication and system status reporting between touchpanels, and also for the system to operate the HVAC systems. The Extron control system solution also relied on the Extron Global Configurator software and the dependability of the Extron IP Link control processors, TouchLink touchpanels, and Extron Certified device drivers to reliably control AV sources, displays, and Extron devices.

Creating the GUIs

The integration team was tasked with creating touchpanel interfaces integrating a diversity of AV and environmental system functions into a GUI that also is easy to operate for the staff. The visual themes of the GUI needed to be consistent with the color scheme and styling of THE RANCH's promotional materials.

To ensure the greatest flexibility in customizing the visual look and feel of the interfaces, graphical elements and page layouts were created from scratch. Third-party image software was used to craft all graphical elements, including the backgrounds, multi-state buttons, icons, and level indicators. The team then relied on the Extron GUI Configurator software as a powerful, easy-to-use design tool to expedite the creation of Extron TouchLink touchpanel interfaces. Custom graphical elements were easily imported into the software through the resource management tool, and then used with the GUI Configurator customization features to create layouts for the primary, pop-up, and modal pop-up pages. The design of the visual elements and page layouts incorporates the principles and recommendations in the Extron Guide to Graphical User Interface Design.

Perfecting the GUIs for the End User

The GUIs were tested on-site at various stages of their development, by uploading them to the Extron TouchLink touchpanels at THE RANCH, and then carefully evaluating their user-friendliness, practical functionality, and visual presence in actual lighting and operating conditions. Modifications and fine-tuning were applied as necessary, ultimately allowing the team to perfect the GUIs for the viewing environment, and to the needs of the management and staff.

The Final Result

Since the completion of the saloon and its opening to the public, sound system engineering experts, local and touring bands, and veteran musicians have had an opportunity to experience THE RANCH, and all have been extremely impressed with the acoustics and performance of the sound system. Reactions were all very positive from professionals and local fans alike.

"We have heard many enthusiastic comments from folks in the audio community," Fish says. "It's great to get the positive feedback for the saloon system in these early days." The saloon regularly hosts local bands and will continue to feature headline concerts with higher-level performers on tour. And it will always be ready to welcome the top-tier artist looking for a flagship country music club for a new album promotion, or just wanting a more intimate place to audition their tunes. THE RANCH has never had a formal promotional campaign or grand opening. Yet it is continuing to quickly grow in popularity throughout Orange County and Southern California, simply by its reputation and word-of-mouth.

In many ways, THE RANCH is representative of the core philosophies that have sustained Extron for nearly three decades – doing the job right the first time, with high quality products backed by industry-leading service that keeps customers coming back. "I created THE RANCH as a place that country music enthusiasts like me could call home," says Andrew. "A top-notch staff serving meals prepared from scratch, and the high performance sound and AV systems have come together to provide the highest quality fine dining and live performance experience available anywhere in Southern California." AVSD

THE RANCH
RESTAURANT & SALOON

AV EQUIPMENT LIST

SALOON

SOUND SYSTEM – HOUSE

2 **Apple iPad 2**
StageMix app for Yamaha remote console operation and SPL monitoring

1 **Dell 24 inch (61 cm) LCD monitor**
For monitoring Tascam digital audio recorder

2 **Clear-Com RS-601**
Wired intercom bodypack

2 **Clear-Com CC-95**
Intercom headset

1 **Clear-Com FL-7**
Intercom call signal flasher

35 **Extron SI 28**
Surface mount speaker, modified with 70 volt transformer

7 **Extron SI 28W**
In-wall speaker, modified with 70 volt transformer and ceiling-mounted

1 **Furman Sound MINIPORT-20**
Remote power relay

1 **High End Systems Road Hog**
Stage lighting console

1 **Laptop**
Hog 3PC virtual console software for High End Systems remote lighting operation and RMS software for Meyer Sound remote speaker monitoring

2 **Meyer Sound 600-HP**
Double-15 inch (38 cm) subwoofer – flown

5 **Meyer Sound 700-HP**
Double-18 inch (45 cm) subwoofer – under stage

12 **Meyer Sound MICA**
In two six speaker arrays for stage left and right

2 **Meyer Sound MM-4XP**
Mini speakers for columns on the dance floor

3 **Meyer Sound UPQ-1P**
Speakers for center fill and DJ back fill

4 **Meyer Sound UPM-1P**
Speakers for front stage fill

1 **Yamaha M7CL-48ES**
Digital 48 channel mixing console for FOH, equipped with:
- 1 Yamaha MY16-ES64 EtherSound card
- 2 Yamaha MY16EX-CA EtherSound expansion card
- 1 Yamaha MBM7CL meter bridge
- 1 Yamaha PW800 power supply

SOUND SYSTEM – STAGE

14 **Bittree 489 Series**
2×24 programmable audio patch bay

1 **Bittree Video Series**
2×24 video WECO patch bay

2 **BSS Audio Soundweb London BLU-160**
Networked digital signal processor

3 **BSS Audio Soundweb London BLU-800**
Networked digital signal processor

1 **Clear-Com FL-7**
Intercom call signal flasher

1 **Clear-Com MS-702**
Intercom main station

1 **Clear-Com Tempest2400**
Wireless intercom system

1 **Extron DMP 64**
ProDSP digital matrix processor

8 **Extron MDA 3A**
Three output audio distribution amplifier

10 **Extron XPA 2002-70V**
Two channel 400 watt power amplifier

6 **Furman Sound MINIPORT-20**
Remote power relay

5 **Furman Sound P-8 Pro Series II**
AC power conditioner

2 **Meyer Sound Galileo 616**
Digital signal processor for management of Meyer Sound speakers

1 **Meyer Sound MPS-488HP**
48 volt power supply for MM-4XP speakers

8 **Meyer Sound UM-1P**
Stage monitor speaker

2 **Meyer Sound UM-100P**
Stage monitor speaker

1 **Meyer Sound UMS-1P**
Subwoofer

2 **Patch bay with 24 RJ-45 ports**

1 **Patch bay with 32 duplex LC fiber optic ports**

1 **Ramtech 54 channel custom stage box**
Two direct outputs and two transformer-isolated outputs

1 **Rosendahl Studiotechnik nanosyncs HD**
Video and audio sync reference generator

2 **Shure PA421SWB**
RF antenna combiner

1 **Shure PA845SWB**
RF distribution amplifier

8 **Shure P9T**
Wireless transmitter for PSM900 wireless in-ear monitors

4 **Shure UR4D+**
Wireless mic receiver

1 **Tascam X-48**
48 track hard disk-based digital audio recorder

7 **Yamaha AD8HR**
Eight channel remote microphone preamp

1 **Yamaha DME 64N**
Digital signal processor

Continued on next page

1 Yamaha M7CL-48ES
Digital 48 channel mixing console for monitoring, equipped with:
- 1 Yamaha MY8-DA96CA analog card
- 1 Yamaha MBM7CL meter bridge
- 1 Yamaha PW800 power supply

2 Yamaha NAI48-ES
EtherSound digital audio network interface

MICROPHONE KIT

1 AKG C 451 B/ST
Condenser, cardioid microphone – matched pair

1 AKG D 112
Dynamic, large diaphragm cardioid microphone

1 Audix DP8 Elite
Drum microphone kit

1 Audix FireBall
Dynamic, cardioid harmonica microphone

3 Audix OM2
Dynamic, hypercardioid vocal microphone

6 Audix OM3
Dynamic, hypercardioid vocal microphone

1 Cascade Microphones FAT HEAD II
Ribbon, figure 8 microphone – Blumlein pair

1 Cascade Microphones V57
Condenser, large diaphragm and stereo pair kit

4 Countryman EMW
Condenser, omnidirectional lavalier microphone

2 Countryman Type 10
Direct box

4 Da Cappo DA12AC
Condenser, omnidirectional headworn microphone

2 Electro-Voice RE320
Dynamic, cardioid large diaphragm microphone

3 Heil Sound PR 20
Dynamic, cardioid microphone

1 Neumann KMS-104
Condenser, cardioid vocal microphone

8 Radial Engineering J48
Active direct box

4 Radial Engineering JPC
Computer direct box

4 Sennheiser MD 421-II
Dynamic, cardioid instrument microphone

6 Shure BETA 58A
Dynamic, cardioid vocal microphone

2 Shure BETA 87C
Condenser, super cardioid vocal microphone

1 Shure BETA 91A
Condenser, half cardioid kick drum microphone

4 Shure BETA 98D/S
Condenser, cardioid miniature drum microphone

4 Shure BETA 98H/C
Condenser, cardioid clip-on instrument microphone

1 Shure DMK57-52
Drum microphone kit

6 Shure SM58
Dynamic, cardioid handheld microphone

4 Shure UR2/Beta 58A
Wireless cardioid handheld microphone

DJ SYSTEM

1 Dell 24 inch (61 cm) LCD monitor

1 Extron IPL T PC1
IP Link AC power and device controller

2 Extron SI 28W
In-wall speaker, ceiling-mounted

1 Extron XPA 2002
Two channel 400 watt power amplifier

2 Laptop
Playback of uncompressed WAV music files

2 Pioneer CDJ-900
Multi-format DJ audio player

1 Pioneer DJM-900
DJ mixer

1 Rane Serato SL 4
Scratch processor

2 Shure PGX4
Wireless receiver

1 Shure SRH750DJ
Professional DJ headphones

AV SYSTEM

2 Denon DBP-2012UDCI
Blu-ray Disc player

7 DirecTV H25
HD receiver

6 Extron DTP HDMI 301
HDMI twisted pair extender

2 Extron DVI 201 A D Rx
DVI twisted pair receiver

2 Extron DVI 201 A D Tx
DVI twisted pair transmitter

2 Extron DVI 201 Tx
DVI twisted pair transmitter

1 Extron DVS 510 SA
Ten input scaling presentation switcher

2 Extron HAE 100
HDMI audio extractor

1 Extron MAV Plus 168 AV
Composite video and audio matrix switcher

4 Extron MTP T AV RCA
Video twisted pair transmitter

2 Extron MTP T 15HD A D
VGA twisted pair transmitter

2 Extron MTP/HDMI U R
Universal twisted pair receiver

1 Extron SMX 300 System MultiMatrix
Modular matrix switcher with two SMX 88 HDMI I/O boards

36 Extron SI 26CT
Ceiling speaker

6 Extron SI 26X
Ceiling speaker, modified with 70 volt transformer

1 Extron SSP 7.1
Surround sound processor

Continued on next page

1 **Furman Sound MINIPORT-20**
Remote power relay

6 **Sharp PN-E521**
52 inch (132 cm) LCD display

1 **Middle Atlantic RM-iDock-3M**
Triple iPhone/iPod dock

2 **Tascam DV-D01U**
DVD player

1 **Western Digital WD TV Live**
Streaming media player

GREEN ROOM

1 **Clear-Com KB-702**
Intercom remote speaker station

1 **DirecTV H25**
HD receiver

1 **Extron MLC 62 RS D**
MediaLink controller

1 **Sharp PN-E521**
52 inch (132 cm) LCD display

CONTROL

2 **Apple iPad 2**
TouchLink for iPad app for remote TouchLink operation

2 **Extron IPCP 505**
IP Link control processor

3 **Extron TLP 1000MV**
10 inch (25 cm) TouchLink wall-mounted touchpanel

4 **Extron TLP 1000TV**
10 inch (25 cm) TouchLink tabletop touchpanel

RESTAURANT

BACKGROUND MUSIC SYSTEM

2 **BSS Audio Soundweb London BLU-160**
Networked digital signal processor

1 **BSS Audio Soundweb London BLU-800**
Networked digital signal processor

1 **BSS Audio Soundweb London BLU-BOB2**
Audio output expander

1 **Denon DCM-390P**
CD changer

1 **Extron IPL T PC1**
IP Link AC power and device controller

2 **Extron MPA 401-70V**
Mono 40 watt power amplifier

61 **Extron SI 26**
Surface mount speaker, modified with 70 volt transformer

17 **Extron SI 26CT**
Ceiling speaker

8 **Extron SI 26X**
Ceiling speaker, modified with 70 volt transformer

1 **Extron XPA 2001-70V**
Mono 200 watt power amplifier

6 **Extron XPA 2002-70V**
Two channel 400 watt power amplifier

1 **Middle Atlantic RM-iDock-3M**
Triple iPhone/iPod dock

1 **Western Digital WD TV Live**
Streaming media player

THE CAROLINA ROOM

1 **DirecTV H25**
HD receiver

1 **Denon DBP-2012UDCI**
Blu-ray Disc player

1 **Extron DTP HDMI 301**
HDMI twisted pair extender

1 **Extron DVS 510 SA**
Ten input scaling presentation switcher

1 **Extron IPL T PC1**
IP Link AC power and device controller

1 **Extron MTP/HDMI U T A D**
Universal twisted pair transmitter

1 **Extron MTP/HDMI U R**
Universal twisted pair receiver

1 **Extron SW4 HDMI**
Four input HDMI switcher

1 **Sharp PN-L702B**
70 inch (178 cm) LCD display

THE PORCH

1 **DirecTV H25**
HD receiver

1 **Denon DBP-2012UDCI**
Blu-ray Disc player

1 **Draper Access / Series V**
133 inch (338 cm) 16:9 motorized front projection screen

1 **Extron DTP HDMI 301**
HDMI twisted pair extender

1 **Extron DVS 510 SA**
Ten input scaling presentation switcher

1 **Extron IPL T PC1**
IP Link AC power and device controller

1 **Extron MTP/HDMI U T A D**
Universal twisted pair transmitter

1 **Extron MTP/HDMI U R**
Universal twisted pair receiver

1 **Extron SW4 HDMI**
Four input HDMI switcher

1 **Panasonic PT-DZ6710**
6,000 lumen WUXGA DLP projector

CONTROL

2 **Extron IPCP 505**
IP Link control processor

1 **Extron TLP 1000MV**
10 inch (25 cm) TouchLink wall-mounted touchpanel

2 **Extron TLP 1000TV**
10 inch (25 cm) TouchLink tabletop touchpanel

THE RANCH Restaurant

The restaurant at THE RANCH offers a high quality fine dining experience in an elegant yet inviting décor, welcoming guests in an atmosphere of comfort and old-fashioned genuine hospitality. A seasonally driven menu emphasizes farm to table fresh ingredients, and features dishes inspired by a variety of regional American cuisines and flavors, frequently complemented with culinary influences from around the world. THE RANCH Restaurant abides by a philosophy of cooking from scratch with the finest ingredients possible, to capture the rustic style of wine country and the freshest flavors of the farm.

Executive Chef Michael Rossi and his culinary team create dishes featuring hand selected, organically grown produce in season, much of it locally harvested from the Edwards Ranch Estates, where it is picked just before the peak of maturity for maximum flavor and served at the table within hours. Other key ingredients include fresh, sustainable seafood selections, meats sourced from the highest quality ranches and farms, and the best from the California artisan bread and cheese makers.

The restaurant offers a value oriented, diverse selection of world class international wines from THE RANCH Cellar, which houses an extensive, 14,000 bottle collection, judiciously selected by Vice President of Food & Beverage and Master Sommelier Michael Jordan. The collection represents the world's premier wine growing regions with an emphasis on California and the West Coast. The wine list features over 80 wines by the glass and over 500 bottle selections to complement the dishes which have been specifically crafted to pair with them.

The sixth floor of the Extron corporate headquarters building is home to THE RANCH Cellar. By the summer of 2013, there will also be a world class instructional kitchen with stadium-style seating for 18 guests, a 50 seat private dining room with its own wine cellar and 20 seat tasting room, and a 200 seat private dining and meeting facility. A large, fully equipped kitchen will support events on the sixth floor.

To ensure the best possible service and quality to his customers, Andrew established an internal culinary R&D program over a year in advance of opening THE RANCH. He built an experimental kitchen, and brought in food and wine experts to conceptualize, create, critically evaluate, and fine-tune menu items, cocktails, and food and wine combinations. The Executive Chef and Master Sommelier are both highly experienced, boasting extensive backgrounds in cuisine and wine with experience in several of the region's most noted restaurants. Andrew absolutely wanted to ensure that everything reflected the utmost in quality and refinement by the time THE RANCH opened to the public.

The kitchen for THE RANCH is a state-of-the-art showcase facility, equipped with the latest in culinary technologies and a full staff that prepares all the essential foundations of its dishes from scratch daily. Chef Rossi has proclaimed this facility to be "The 'Lamborghini' of kitchens" and "The most beautiful kitchen in Orange County."

web	Please visit www.theranch.com for more information on the restaurant and online reservations.