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Performing Arts / Media Facilities Planning and Design



BUILDING THE HOUSE OF



THE FORMER HOME OF SIEGFRIED AND ROY IS REVAMPED FOR THE CIRQUE'S NEW SHOW

By: David Barbour

Once again, a new Cirque Vegas spectacular has found a home in a theatre designed for another show. Just as *KÀ* occupies the home of the now-closed *EFX*, so *LOVE* is ensconced in the site of the former Siegfried and Roy spectacular. (It's interesting to see how shows like *EFX* and Siegfried and Roy, once the avatars of a "new" Las Vegas, have made way for the Cirque's domination of the Vegas strip.)

It would be a very great mistake to think that Cirque du Soleil just moves into a theatre, however. As was the case with *KÀ*, the original space was more or less gutted to the walls, then thoroughly reimagined; through this process, an already-existing custom-designed venue has been completely reworked for a new purpose. At the end of the day, it might be simpler to build an entirely new theatre.

Which, in a way is what happened. Responding to the designs of Cirque du Soleil scenic designer Jean Rabasse, the

theatre consulting firm Auerbach Pollock Friedlander worked closely with the architect and construction manager Marnell Corrao Associates, and a host of other specialists, to reconfigure the space, redo the acoustics, and install a complex infrastructure.

Reconfiguring the space

Perhaps the most fundamental change has to do with the configuration of the space. The Siegfried and Roy show took place in a proscenium arrangement. *LOVE* is performed in the round and the show takes place essentially throughout the arena, with scenery and performers entering from all directions. In addition, there are large projection screens that wrap around the space. The work of Auerbach Pollock Friedlander was to create a total integration of audience, performers, and theatre technology, to allow for full audience immersion in the production, as conceived and designed by the Cirque creative team.

"The stage is essentially a broad area of lifts, traps, and slipstages that resides at the line of the [former] proscenium," says Len Auerbach. "It's a full surround audience, with the theatre appearing as one unified space."

He adds that the firm's role here is different from other projects. "Jean Rabasse, the show's designer, conceived the seating; we dealt with sightlines, elevations, the typical work that we do on any project.

We were contracted with Marnell Corrao, in the usual fashion. Our work was incorporated into the architectural plan. At a certain point, however, for reasons having to do with the time frame, Cirque also hired us directly to assist with the overhead elements related to scenery. We ended up in a bifurcated role, assisting with the building's infrastructure and also facilitating the additional overhead system having to do with the scenery and acrobatics. We were in a situation where we were coordinating with all parties."

A full theatre split-level technical grid over the entire stage and seating area supports performer access, lighting system, projection, rigging, high-speed trolley hoists, scenery storage, and special effects. Also specified were four separate control booths—for automation, rigging, lifts, lighting and projection, and one in-house sound mix position—and the center floor stage, which combines lifts, traps, and sloats/slipstages contributing up to 2,300 sq. ft. of operable staging area.

In order to accommodate the production's scenery, "we had to double the size of the existing basement," says Don MacLean, senior supervisor, infrastructure department. "There was a small excavation for sound gear down there, but we excavated another 5' and pushed out downstage of the plaster line another 40 or 50'. We had to dig down another 7' to accommodate the stage lift machinery."



ALL PHOTOS, EXCEPT WHERE NOTED:
TOMAS MUSCIONICO C2006 CIRQUE
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SPECTACLE/CIRQUE DU SOLEIL, PART II



PHOTO BY JASON PRITCHARD



PHOTO BY JASON PRITCHARD

Above: Backstage views, showing two of the show's control systems. **Opposite:** "Being for the Benefit of Mr. Kite." **Previous page:** "Revolution."

Also under Auerbach's purview, supervised by Tom Neville, were the systems for the automated rigging, including 25,000 sq. ft. of technical gridiron, power distribution throughout the theatre, new multi-tiered rigging for the stage automation system, and three high-speed data/communications networks, set up to insure that the trolley hoists, lifts, and sound, video, and communications systems function flawlessly during complex cueing sequences.

Acoustics in the round

At the same time, Mark Holden of JaffeHolden, was faced with the challenge of creating the best possible acoustics for a show that is all about the music. "There was a lot of pressure for the room to be acoustically excellent," he says.

That was easier said than done, however. "In-the-round spaces are notoriously poor for amplified acoustics—and we knew we'd have 6,000 loudspeakers," he says. "It was an immensely complex task to analyze every possible sound reflection off of any surface. It was a real challenge to get sound that was smooth, even, and well-

balanced."

Holden says he worked closely with Jonathan Deans and Don MacLean as well as Anik Patry, theatre design director for all Cirque projects. The acoustician notes that certain aspects of the design caused him great concern, most notably the 100 x 20' curved projection screens, which threatened to cause a terrible echo in the room.

"Through a collaborative process with the Cirque projection staff and Scharff Weisberg," says Holden, "we evaluated a half-dozen screen materials in our labs—we have a testing chamber where we test fabrics. Then we sent them to Cirque—they have their own video labs where they test projection screens. We went back and forth and eventually came up with a kind of filled scrim that was sonically transparent, with no reflections, and which met their projection needs."

In addition, says Holden, "We created bass traps, using special bass trap banners, hanging them behind the screens to soak up the low-frequency energy. By spacing, angling, and suspending them in a certain way, we eliminated the boominess that can rattle around in an arena."

Not all of Holden's job involved taking away noise and reverberation. "One criticism of some Vegas facilities is they're kind of dead," he says. "When some people start clapping, others don't hear them; it makes for an isolated, individualized experience. Cirque wanted audiences to be more engaged in the process. Our challenge was to create a room with a better sense of audience participation. Our standard approach would have been to cover everything with sound absorption, but that would make the room dead, so we left enough sound energy in the room to conserve audience participation energy—it meant adding materials to the balcony fronts that would diffuse sound."

As always with Cirque, there were unexpected challenges. "Before we opened," says Holden, "Giles and Sir George Martin wanted to mix their digital tapes in a way that would work with

the room's acoustics—and they wanted to do it onsite. Of course, they needed a studio to do it. We had a rudimentary sound room planned in the basement; then Don MacLean said they needed a recording studio in a week! We did a quick survey of the room, then specified materials. We had to take stock bass traps and acoustical panels wherever we could find them. To everyone's amazement, the studio was satisfactory; in fact, it exceeded their expectations!"

Integrating stage lifts and machinery

In order to facilitate the many effects in Rabasse's scenographic design, Auerbach Pollock Friedlander, closely coordinating with project manager Mike McMackin, developed an infrastructure of stage machinery. There are five stage lifts, built by Montreal-based Show Canada and installed by Pook Diemont & Ohl of New York. The stage is shaped like two diamonds, says MacLean and "each diamond has two stage lifts, in the north and south ends of the stage, plus one rectangular lift." The lifts cover a total surface area of 1,390 sq. ft. and have combined horsepower of 370. The center, rectangular lift can travel from the trap room area to 8' above stage level; the other four can travel to 18" above the stage. The lifts travel at a rate of 1' per second.

In addition, there are two horizontally traversing sloats or slipstages, 135 sq. ft. each, each with two onboard lifts of 68 sq. ft., which allow the stage floor to be closed over the center lift while scenic elements are removed in the trap area; as new pieces are put on the center lift, the sloats open and the new elements are revealed. Also, four 54-sq.-ft. hinged trap decks, combined with the stage lifts, allow the stage area to be transformed into a 1,600-sq.-ft. black hole, giving the appearance of a void. These elements were built by Conception D. Bédard. Scenic automation is by Stage Technologies' Nomad control console.

The combination of these elements makes for a constantly changing stage, allowing for a wide variety of looks.

Flying scenery and performers

However, scenery doesn't only track onstage or appear from below. Auerbach specified 11 motorized overhead trolleys, which are integrated with wireless controls and travel at a maximum speed of 6' per second to transport both scenery and performers. (These units are key to the overhead acrobatics that figure in the show.) The trolleys are fitted with vertical hoists on a rotational axis; a typical trolley unit consists of four vertical hoists mounted on a rotating chassis, allowing performers or scenery to be moved vertically or horizontally while rotating simultaneously. There is a total of 22 vertical hoists and eight rotating chassis. In addition to the production's giant curving projection screens, which remain stationary, an additional four motorized screens, plus six traveling scrims, provide many projection surfaces.

Interestingly, MacLean says, "The original high grid from Siegfried and Roy was left intact and we use it for other tracks that are underhung from that original high grid, in order to have tracks that manipulate scenery and artists on top of the working grid. They can drop in scenic elements and or performers through two diamond-shaped holes placed above the diamond-shaped parts of the stage. There are two horizontal tracks over those holes, as well as a large rectangular slot that runs the width of the proscenium arch from east to west at the midline of the stage."

The custom screens are by Lesna, Inc, while the scrim traveler track is a custom installation by Triple E, which is represented in the US by Rose Brand. (According to Rose Brand's Peter Finder, "There are four 120' long Triple Chain Track systems, each one running 6' per second. The scrims are 48' high x 70' wide; the Chain Tracks' tight radius stacking system allows them to stack in a compact space while remaining flat and unwrinkled.") The performer flying carriage systems' hoists and rotation assembly are by Stage Technologies and make use of that company's Big Tow winches. The 22 possible counterweight rigging locations—five of which are currently utilized, are by AMC Fabrication and were installed by Pook Diemont & Ohl.



Communicating LOVE

In addition to consulting with Deans on the creation of the production's sound system (see previous story), Auerbach specified the communication system, using products from Clear-Com. It includes a 72-port digital matrix intercom system interconnected with a digitally controlled analog matrix, which is capable of switching 216 stations into eight party lines. The system also provides ten channels of wireless intercom feeding 20 wireless belt packs.

According to Matthew Ezold, of Auerbach, the reason for the mix of digital and analog products is a practical one. "Cirque shows place such heavy demands on communications that the amount of cabling can add up very quickly. If you have too much cable in the analog portion of the system, the gain, noise floor, and frequency response of the systems would be adversely affected," he says. "We decided to set up multiple eight-channel party line systems and tie them together using the Compact 72 digital matrix. We have four remote locations and each one runs anywhere between 24-72 channels from the RCS-2000 [programmable source-assignment panel]. Then we take the channels from the RCS-2000, and run them on four-wire back to the Compact 72 matrixes. It reduces the overall amount of cable; the maximum home-run length was under 200' instead of 1,000'.

Paul Garrity of Auerbach adds, "That way, we effectively have separate analog systems in different quadrants in the theatre, which we tie together into the digital matrix. Cirque uses an eight-channel party line, but each location is home-run to the matrixes. If you ran all this analog in a traditional way, you'd have miles of cable—and wouldn't be able to hear anything."

Auerbach also specified backstage monitoring and paging over 82 loudspeakers. A series of 20 remote color video cameras are routed through a 26-channel modulated video system for monitoring performers, musicians, and critical backstage systems. A fiber and CAT 5 backbone provides interconnectivity for current systems and future expansion. An FM assisted-listening system for the hearing-impaired is provided throughout the space. More than 230 panels and wall plates are fed from an analog and digital wiring infrastructure using both copper and fiber-optic cabling.

As MacLean notes, the challenges just go on: "The placement of a grid over the audience poses issues for the fire inspector. Also, we had to relocate the bulk storage tank for the liquid nitrogen at least 50' away from the building, for safety reasons. There are all sorts of little challenges that occur when you're retrofitting an existing building." Still, the Cirque has worked miracles, technologically and aesthetically, and all of them add up to LOVE. 🎪

Guide, Show Concept Creator, Director:
Guy Laliberté.

Writer, Show Concept: Dominic Champagne.

Director of Creation, Show Concept: Gilles Ste-Croix .

Associate Director of Creation: Chantal Tremblay.

Theatre and Set Designer: Jean Rabasse.

Costume Designer: Philippe Guillotel.

Sound Designer: Jonathan Deans.

Lighting Designer: Yves Aucoin.

Video Projection Designer: Francis Laporte.

Choreographers: Hansel Cereza, Dave St-Pierre.

Acrobatic and Rigging Designer: Guy St-Amour.

Acrobatic Performance Designer: Daniel Cola.

Make-up Designer: Nathalie Gagné.

Props Designer: Patricia Ruel.

Puppet Designer: Michael Curry.

Aerial Acrobatic Designer: André Simard.

Dramaturge Consultant: Alexis Martin.

Comic Audio-clips Designer: François Pérusse .

Music Director: Sir George Martin .

Music Director: Giles Martin.

Executive Producer: Neil Aspinall.

Theatre Consultant: Auerbach Pollock Friedlander.

SVC Consultant: Auerbach Pollock Friedlander.

Architect and Construction Management: Marnell Corrao Associates.

Mechanical/Electrical: Bennet and Jimenz .

Structural: JBA Consulting Engineers.

Acoustician: JaffeHolden.

Automation Controls, Winches, Tracks and Trolleys: Stage Technologies, Inc.

Lifts: Show Canada.

Counterweight Rigging and Stage Lift Installation: Pook Diemont & Ohl.

Slipstages/Sloats, Sloat Lifts, and Traps: Conception D. Bédard.

SVC: Solotech.

SOUND:
Main Arrays and Overhead: Meyer Sound M1-D, M2-D, CQ-1, CQ-2.
Subwoofers: Meyer Sound PSW-2, USW-1P, Danley Sound TH-1151.
Surround: Meyer Sound M1-D, Innovox custom fabricated units.
Stage edge: Meyer M1-D.
Portable: Meyer UPA-1.
Power amplifiers: Crown CTS2000, CTS3000, CTS4200, CTS8200.
Monitoring: Meyer Sound RMS with iLon Ethernet adapters.
Power distribution, rigging and installation components: Solotech.
Equipment Racks and Accessories: Middle Atlantic
FOH Console: Level Control Systems Console with VRAS (Variable Room Acoustics).
Playback System: (2) Rain Recording Custom Element 64.
Tascam GigaStudio 3.
Realtime Music Solutions Sinfonia.
(2) RME ADI-642 MADI-to-ADAT optical converter.
(4) Apogee DA-16x digital-to-analog converter.
(1) Apogee Big Ben master word clock.

Miscellaneous:
(6) Waves Maxxbass processor.
(18) Lectrosonic VRT trans/receiver.
(1) Yamaha PM5D console.

PROJECTION:
(24) Digital Projection Highlite 12000Dsx projector.
(4) Digital Projection Lightning 30sx+ projector.
(20) Green Hippo Hippotizer-HD media server.
(1) grandMA Light.
(4) Brother, Brother & Songs v-Base moving projector yoke.
(3) Dtrovision 18 x 18 DVI matrix switch.
Stardraw remote control software.

LIGHTING:
Automated Units:
(54) Vari*Lite VL3500Q.
(64) Vari_Lite VL3500S Spot.

(56) Vari*Lite VL2500 Spots.
(40) Vari*Lite VL3000Q Wash.
(21) Martin Atomic 3000.

Conventional Units:
(24) ETC Source Four 5°.
(48) ETC Source Four 10°.
(200) ETC Source Four 19°.
(125) ETC Source Four 26°.
(6) ETC Source Four PAR.
(40) Altman Micro Strip.
(8) Robert Juliat Ivanhoe
(16) Wildfire WF-LT40S. Eclipse 2.
(12) Wildfire Fluorescent DMX.

LED Units:
(130) Color Kinetics ColorBlast6.
(5) City Theatrical PDS 750TR.
(5) City Theatrical PDS 375TR.
(12) Color Kinetics iW Blast 12.
(6) Color Kinetics iW PDS-150 DMX.
(20) Color Kinetics iW Profile.

Atmospherics:
(6) MDG Atmosphere.
(4) MDG Low Fog Q.
(6) MDG Max 5000.
(8) MDG Max 3000.
(2) MDG Mini Max.

Lighting Control:
(2) MA Lighting grandMA.
(1) grandMA Light.
(1) grandMA PC.
(9) MA Lighting NSP.

Production Video System: Panasonic AS-E560 cameras with pan, tilt, zoom control, and AW-RP501 controllers.

Panasonic AW-E600 & WV-CP470 fixed cameras.

Panasonic WV-BP330 monochrome cameras (IR).

Cantronic Systems CSI-IR 100m60 IR illuminators.

Leitch video distribution amps.

Blonder-Tongue modulators, amps, combiners, and taps.
Rane audio distribution amps.

Bittree patching panels.

Assistive Listening System for the Hearing Impaired: Listen Technologies LT-800-216 wide-band wireless FM assistive listening system with antenna and receivers.

Production Intercom and Backstage Paging Headend System: Clear-Com Matrix Plus 3, Compact72 digital mainframe. Clear-Com I-stations, I-1210, I-1370, I-1470.

Clear-Com RCS-2000 eight-channel analog switching matrix.

PS-464 four-channel power supply.

Clear-Com RS-501, RS-522 beltpacks, KB-211 loudspeaker stations.

Sennheiser HMD-410 headsets.

Telex BTR-800 wireless base stations and TR-800 belt packs.

Program Monitor/Page System: Peavey Mediamatrix X-Frame. QSC CX-204V power amplifiers.

EV 409-8T and EAW SMS3 loudspeakers.

Ethernet Audio Network: Linksys workgroup switches and 801.11G access point.

D-Link Ethernet 2witches with SC fiber ports.

Fiber-optic interfaces and panels by Hubbell and Black Box.

Portable Equipment: Microphones by Shure, Sennheiser, and others.

Whirlwind stage boxes.

Yamaha and Mackie submixers
Stands by AKG.

Portable monitors by Anchor.

MIDI distribution by JL Cooper.



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