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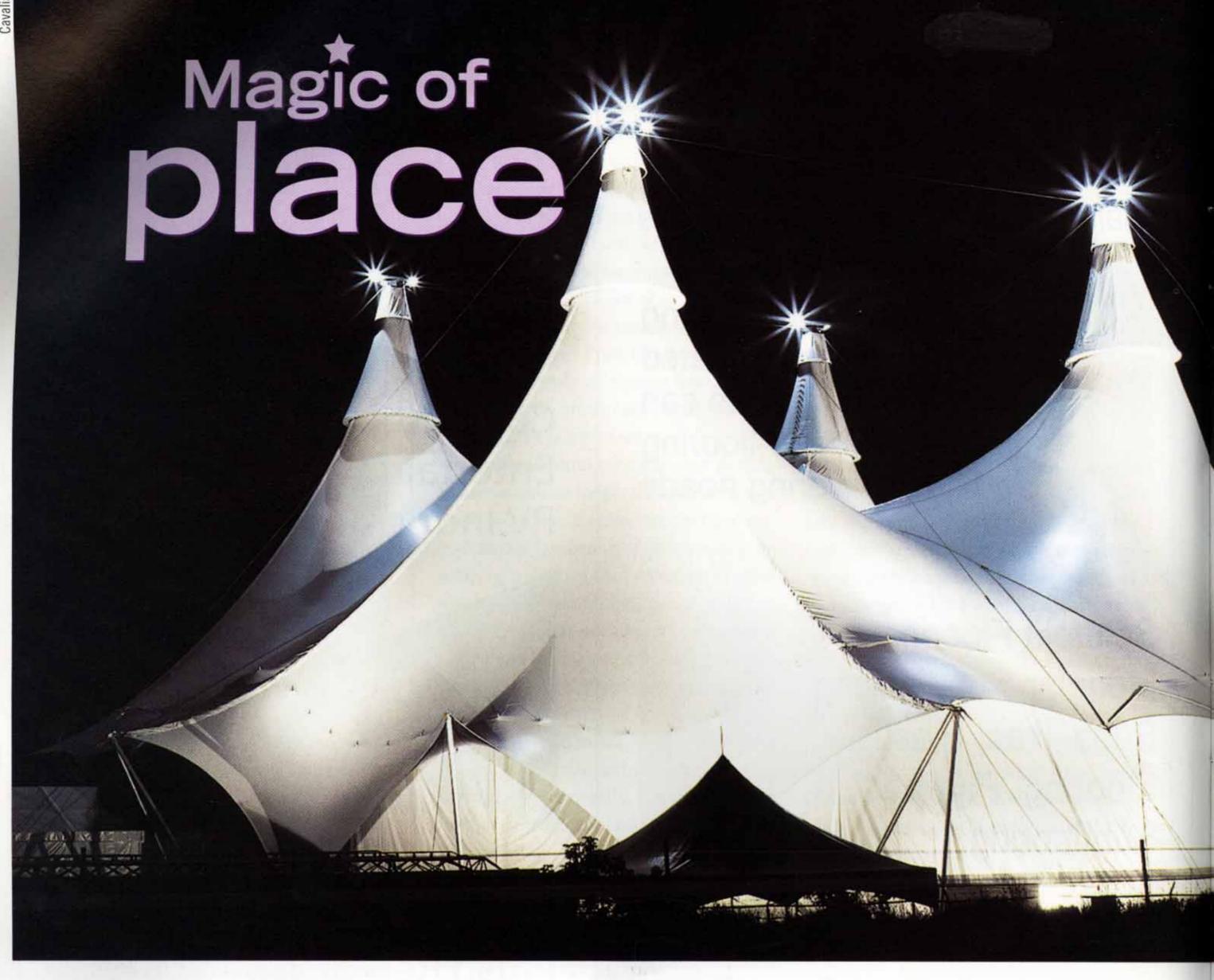
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Exceptional tents set the stage for music and theater.

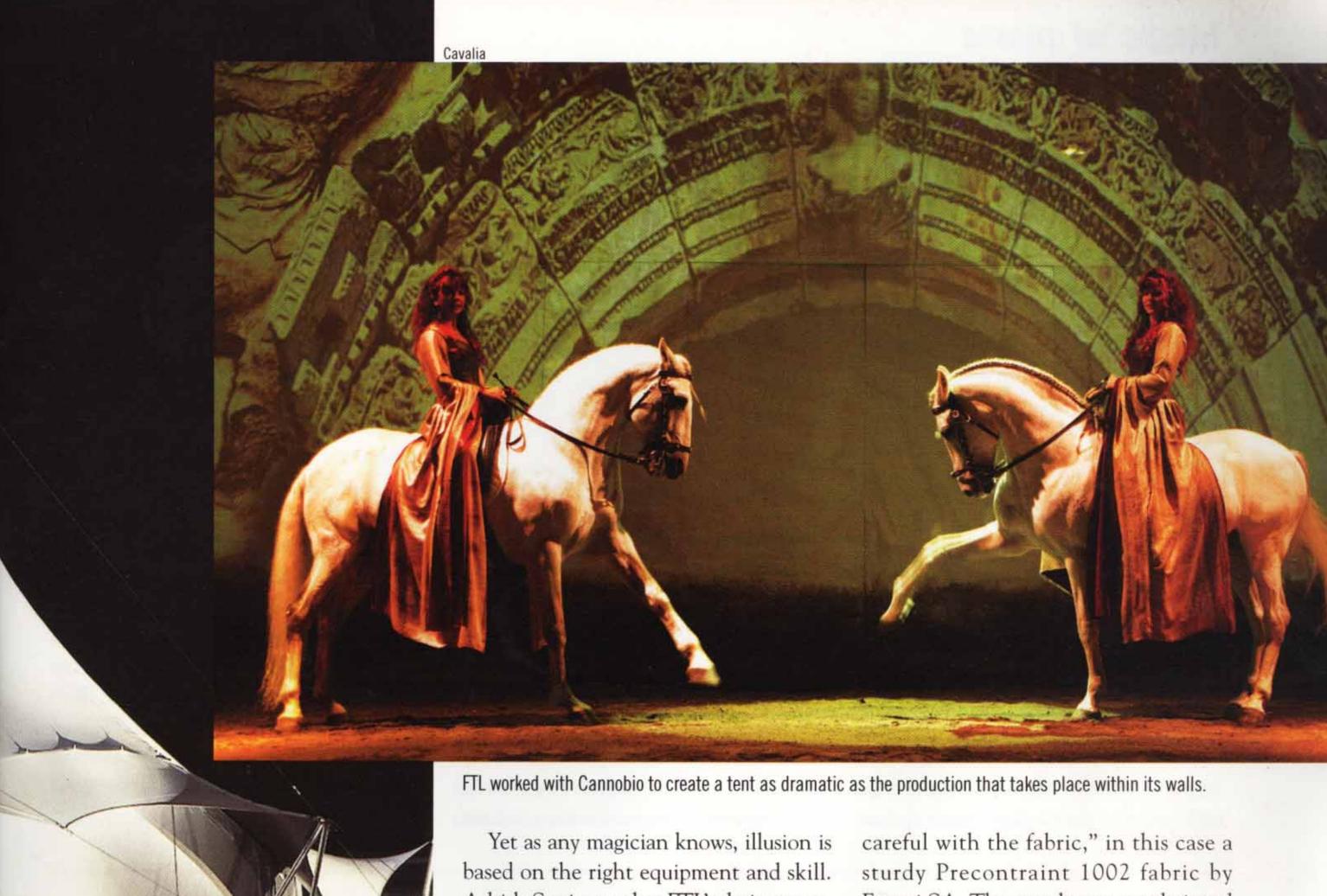
by Frank Edgerton Martin

When people visit circuses and outdoor music concerts, it's not just the show that they remember, but the experience of being there—often shaped by custom-built tents and stages designed for the road. From Ringling Brothers to The Rolling Stones, great performers have created great stages. This fusion of design and performance continues with two noted events, the traveling Cavalia Horse Show that is now touring Canada and the U.S. and the annual Danish outdoor music festival at Roskilde that is a destination for some of the world's most innovative bands.

Although very different venues, Cavalia and the Roskilde Festival share a number of stage challenges for event planners, including the need for flexibility, drama and a sense of allure. Offering a panoramic introduction to voltige, the French art of horsemanship where riders perform near superhuman feats on horseback, the Cavalia show is rich in sound and lighting effects that focus attention and mood. In a sense, the entire Cavalia tent—including seating and performance area—is the stage itself, the self-contained indoor realm in which the audience becomes lost in the show. For Roskilde, scheduled every summer in rural Denmark, the iconic Orange Tent stage is the symbol of the festival and the focus of attention for the thousands of visitors who listen to music under the open sky.

## Cavalia's magical big top on the road

Founded by Todd Dalland and Nicholas Goldsmith, the New York based FTL Design Engineering Studio is a leader in lightweight, deployable design and construction tech-



nologies. With staff engineers and designers, the office specializes in unique structures for performances, special events, industry and the military. Their recent circus tent for Cavalia represents the promise of tensile structures for public events, whimsical design, portability and repeated use.

Cavalia bills itself as "A magical encounter between man and horse." With 30 horses and an equal number of performers, the traveling show explores the historic bond between humans and horses. As stated in Cavalia's marketing, the tent is a player too: "An incomparable show demands no less than an incomparable setting. At a height of over 100 feet, the Cavalia Big Top is as magical as its acts."

Yet as any magician knows, illusion is based on the right equipment and skill. Ashish Soni served as FTL's design manager for the Cavalia project. To create the tent, the family-owned Canobbio of northern Italy brought generations of experience in circus tent fabrication. With a true sense of teamwork, Canobbio came to New York to work with the client and the designers at FTL's office to forge a solution that would be evocative, portable, cost-effective, and durable.

"We said to ourselves, let's try to fuse tensile technology forms with the image of a traditional circus tent," Soni recalls. "As usual, circus tents always have this problem with installation." He explains that, from FTL's perspective, "the key for contemporary entertainment venues is the installation time versus the length of the residence. Fabric allows you to pre-manufacture a much larger structure that can erected in the narrow window of time available." The 45,000 square foot Cavalia tent can be erected by a crew of six in six days without cranes or heavy equipment.

The details are so rugged that they won't deteriorate. "But you do have to be

careful with the fabric," in this case a sturdy Precontraint 1002 fabric by Ferrari SA. The membrane was designed in the vocabulary of a tensile structure, sailing over the sidewalls with alternating high and low points, giving shape to the fabric. The sidewalls are simply clad on and are not load-carrying. Their nimble design allows the main skin to be installed quickly. Like the traditional circus tent at the edge of town, the imposing scale of the structure stands out in the landscape, acting as a beacon for the show—and an attraction in itself.

"Most circus tents must be forced down into smaller pieces," Soni says. "We decided to try something different. Now we have simplified that to four main masts for a kind of rounded square." Supported by four 100-foot primary masts spaced at 80 feet, the Ferrari membrane floats independently of the sidewalls with alternating high and low points.

For strength against the natural elements, FTL engineered compression tension to balance the downward loads from snow and rain against the upward push created by wind. To foster structural lightness, FTL employed belts rather than





The Roskilde Festival Orange Tent follows the design for the original tent built in the 1970s.

cables to reinforce the fabric. "We let the fabric do all the work, and the edges are reinforced by belts."

Yet, traveling entertainment venues need to be more than functional and light. The design needs to become an icon, part of the sizzle and the emotion that people remember and share with their friends. Soni explains with pride that Cavalia's peaked tent is so high that the seating ranks are able to rise up at dramatic 60-degree angles. "Only fabric can create such large temporary volumes," he says. "The steeper you go, the less the compression weight. Because you create

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such a large volume, the space becomes a celebration for people coming together...and that's entertainment. "

Thus the highly-portable Cavalia structure offers both the excitement of festive grandeur and the intimacy needed to immerse audiences in the unfolding shows. Soni says that, thanks to the steep seating and a background structure that disappears into darkness once the action begins, "you can to feel as if you are one with the performers...that you can go out and touch them."

## The Orange Tent: Roskilde Festival's evolving symbol

Made in the USA

In many ways, tents of all sizes are the symbol for Denmark's Roskilde Festival, a showcase for cutting-edge new music from around the world. On the festival's Web site, the button for more information about the Roskilde "community" is a cluster of small tensile camping tents. Once one arrives at the chat room, the splash page



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