



The Pearl of Dubai

La Perle is Franco Dragone's most ambitious water show to date

By: Sharon Stancavage

"I want to provide a little piece of eternity for the region, a place of escape that any culture and ethnicity can understand and enjoy. I was so inspired by Dubai and it is an honor to introduce that vision to the world," explains Franco Dragone, founder and artistic director of Dragone Studio, when asked about *La Perle*, his new water extravaganza in the United Arab Emirates.

Located in Al Habtoor city, *La Perle* takes place in the only purpose-built theatre in the UAE. "In Dubai, there is not a tradition of places where you go sit to see a live performance; there are shows that are based on Arabic traditions and then you have rental spaces in convention centers. But there is no theatre dedicated to one show, especially not that size. We are the first ones to get there with any kind of large-scale theatre," explains Jean Marcouiller, *La Perle*'s executive production manager and head of the Dragone Studio.

The theatre was designed by Dragone, with Jean Rabasse as the theatre designer/show scenic designer, led by the Dragone theatre development department. The architects at Khatib & Alami put everything on paper and the building was constructed by HLG (Habtoor Leighton Group); both organizations are based in Dubai. The theatre consultants were Auerbach Pollock Friedlander (APF), who have worked with Dragone on several projects. The vendors spanned the globe, including those in the Emirates, the EU, and North America. Marcouiller continues: "The government leaders were very keen to help us do the show, and get the proper certification. They were very open to using common third country community stan-

dards, and make them their own, so they don't have reinvent the wheel. If something was good for the CE, it was good enough for us; we just had to supply the rules and show them that it was the consensus."

The theatre has a mere 14 rows, but seats a total of 1,250 patrons. "We wanted it to feel as if you were inside a grotto or a cave, and we wanted to be able to change the mood of the cave by using video projection," Marcouiller reports. The lower levels of seating are irregular and based on the curves of the wet stage. "You have curves and levels, so the seating is made in that concept that people are sitting on something like a grassy knoll where they sit where they can," he adds.

The wet stage area includes a 5.5m (18') wide, 8m (26.2') deep dive pool in the middle of it. Simon Lemieux, production technical director, explains, "The whole stage, except the dry stage [a 26.8m (80.4') x 13.9m (39.9') rectangle upstage], can become wet or can retract below and then you just have the 8m well in the middle. It's a flat surface where we can put about 350mm (13.7") of water by transporting water from one tank to the other." The wet stage can drain in a matter of seconds, thanks to a complex draining system built into the theatre.

"On this show, we went back to the basic of more realistic water effects, like the waterfalls on each side of the proscenium," Marcouiller says. The waterfalls are an unexpected, stunning effect that did have one major issue. "The big challenge was the bounce back into the audience; the waterfalls are almost at 17m (55.7') up and you can make every kind of test and simulation that you want,



The lighting rig features a wide variety of units from Claypaky.

but between the accumulation of the waterfall water combined with the draft of the theatre between the dry and the wet stage, you never know which way the water drop will go. With water like this, you can never mock this up; you turn it on and see what it is. I think we were lucky in that the dry stage house has created a very good draw towards the stage, instead of pushing towards the audience.”

The dive pool, the wet stage area, and effects were constructed by Ghesa, based in Madrid. Marcouiller explains: “We’ve worked with Ghesa on events before and we know their rental equipment, so we didn’t mind working with them on this project. The water system for the pool and the water special effects were linked together to the same supplier, and effectively, there are not that many people in the world that can do that.”

Staging

For the fly system, the rigging, and several of the major scenic pieces, Dragone turned to TAIT Stage Technologies, located in London, another firm that has a long relationship with Dragone. “One of our fortes is providing high-performance flying systems and rigging systems. We tend to need to work at high speeds and high acceleration and with someone like Dragone, it’s 4m or 5m a second,”

reports Tait Stage Technologies Group CEO Mark Ager. The artist fly system includes 20 rigging points; for every three to four performers, there is a rigger.

The scenic system is exponentially larger. “For the scenic, there are 100-plus rigging points. We have 28 scenic winches, but they vary from four-line winches to ten-line winches, depending on the scenic element,” says Tait Stage Technologies project manager Brian Malone. The project used a variety of winches. “We had 48 BT290, 390, and 490 winches that vary in speed up to 4m (13’) per second for performer flying,” Malone adds. The grid height is 30m (98’), which is similar to other Dragone shows.

Most of the system is controlled by Tait Stage Technologies’ proprietary Maxis SI Digital Position Control System. “We’ve developed this over 10 years and it’s a full-feature, multi-user, complex system that allows multi-dimensional flying and other movements. In this case, we’re doing a lot of two and three-dimensional flying, which is all programmed into this motion system, and then controlled by our front end,” Ager explains. The automation system has been a challenge throughout the process. “They [Dragone Studio] have two years to develop what they’re going to do, so consequently, it’s a more complex show and a lot more effects are used throughout the show, simply because they have more time to integrate them,” he adds.

While the way artistic director Franco Dragone works is legendary—much of the production is created extemporaneously during rehearsals—another aspect of the show makes it very different from standard theatrical fare. “In a big musical, they’ll do a tech run, and start from the beginning and run all the way through to the end, and that takes two or three weeks. We do West End musicals, and they will spend maybe the first two days getting four minutes into the show,” notes Ager.

That type of schedule does not work for *La Perle*. “In acrobatic shows, you can’t do that,” Ager says. “You have to allow the acrobats to do their work out every day on equipment, and they can only do it for a certain length of time. If you have a Dragone show, where there are 20 people doing somersaults in the air, they are probably going to rehearse that for an hour and a half, and then they have to break. They put the show together into acts, and then they work out the changes. Of course, that does mean that it’s a lot harder to build up the final sequencing, because you have to make sure everyone is in the right place. Basically, you’re building the show in parallel, rather than series, which is a challenge.”

Upstage is the first major scenic piece; the doors that separate the wet and dry stages. Malone reports: “There

are four 22m (72') high by 4m (13') wide doors that weigh 6.5 tons each, and they run on a rolling beam system. The 24-ton doors open and close in a mere 30 seconds. It’s quite a good reveal when you see the entire proscenium just disappear into the wing.” The doors needed to be done in four pieces so that they could store offstage.

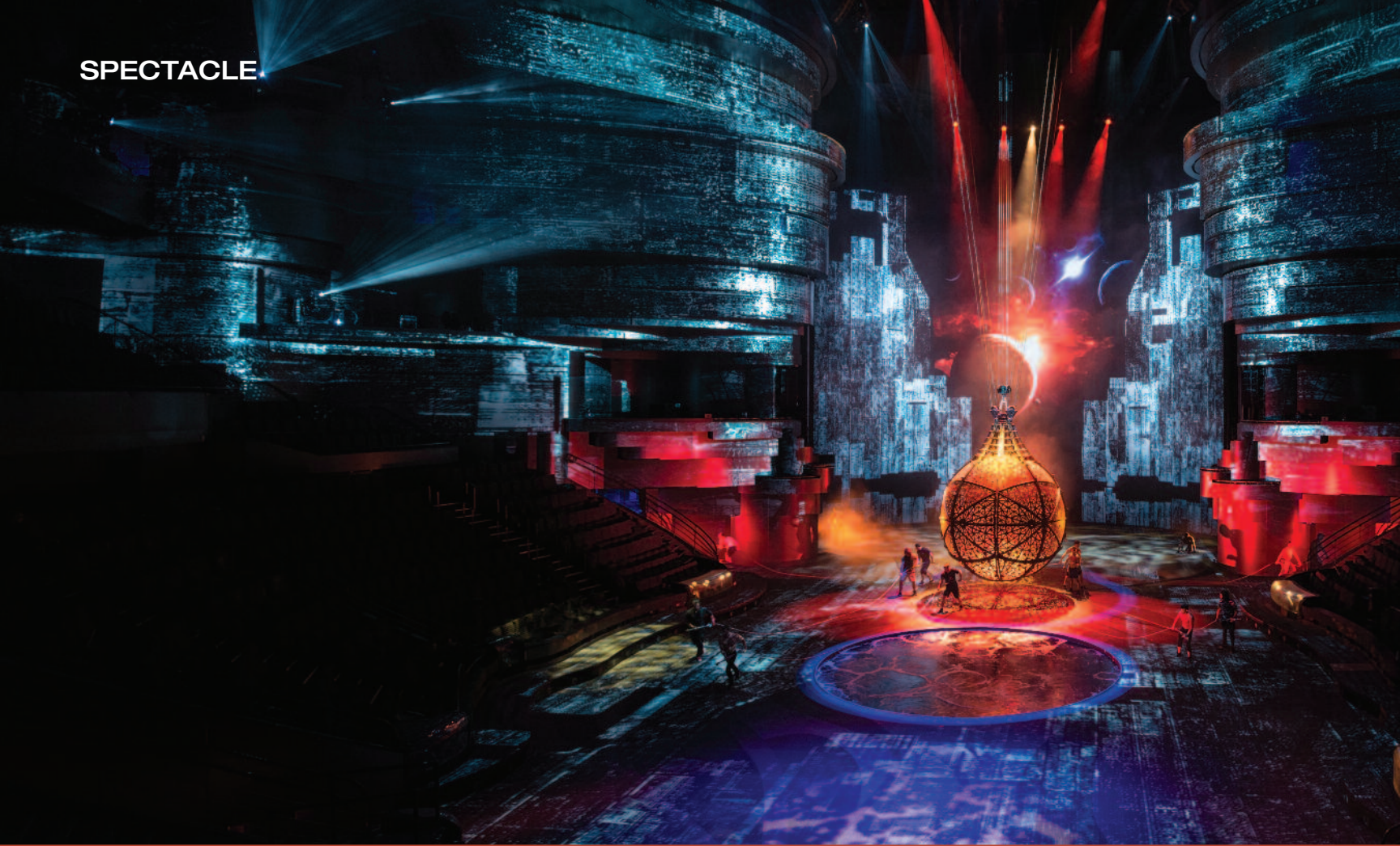
Although *La Perle* is filled with acrobatics and unexpected elements, it also includes two traditional circus feats. “The Wheel of Death is rigged using two of our CH:ls, which is our intelligent chain hoist. With that, we can have variable speed control and synchronization. We synchronize the hoists with each other, so one doesn’t go off faster than the other and cause the effect to tip,” Malone explains.

The death (as in “death-defying”) theme continues with the Globe of Death act, using a rigged globe designed by Rabasse. “The Globe of Death effect is absolutely phenomenal, it’s the show-stopper for me,” Malone says. The effect is popular in circuses around the world, and has been re-imagined for *La Perle*. “Normally, this is a ground-supported apparatus, where the bottom stays static and then the top lifts. We do it differently,” Lemieux says.

The globe of death involves a large 4.6m (15') diameter globe that drops down from the ceiling; a door opens on



The enormous scenic doors are located upstage. Downstage, the scene is transformed via imagery from Barco projectors.



A full-on view of the set with the dry stage in place.

the upstage side, and five performers on motorcycles drive in. It also splits in half, and, at one point in the performance, the lead male is trapped in it as well. The globe is then raised high above the stage. “For the fabrication of the ball, we didn’t want to do the normal metal bar cross pattern,” Lemiex notes. “We wanted it to be a scenic element, so we wanted to control the pattern. We had to build it in China with one of our normal suppliers, because that’s the only place where they were using the old method of stamping the steel plate without compromising the structural integrity of the plate. Custom stamping of this size and thickness simply isn’t done anymore.”

Rigging the globe was a complex task. “It’s not the weight of the motorcycle or the men, it’s the centrifugal force that is generated that was a concern. For this piece, we had to go out of our way, in terms of the engineering and the fabrication of this,” Lemiex says. Ager adds: “We were nervous about [the globe] at first, and we did a lot of studies with the motorbike guys driving around and what the effects would be on the tension. There’s quite a lot of complexity in the loading of that piece.”

The Globe of Death “uses five of our BT490 winches, which are the big boys,” he adds. “They take 20 tons of tension into those lines to hold the ball steady and stop all

of those centrifugal forces,” Malone reports. The Globe of Death load is an amazing 4,000kg (over 88,000lb).

Also making an appearance during the production is a 6m (19.6’) tall, Golem-like puppet that lumbers around the stage; it was created by a South African puppeteer Roger Titley. Lemiex says, “The puppet is manipulated by 3D rigging combined with ground manipulation for the legs. It’s rigged on a 3D acrobatic fly rig, and the head and the shoulders are driven by someone sitting on top of the rigging.” A total of seven people—six on the ground and one overhead—operate the puppet.

For the finale, a joyous Bollywood-style affair that includes most of the cast, a large, two-part scenic piece called “the frame” makes an appearance. “The frame is pretty big; it’s approximately 7m (22.9’) wide by 8m (26’) high,” Lemiex says. The inner portion of the frame can hold up to two dozen people. Malone explains: “Basically, there are two frames running up and down. One has the crown on it, and there’s another piece inside of it. So this is three 6-line pieces, so we have three winches working together, with six lines on each to pick up that.”

La Perle is a work in progress, and there are two new Tait Stage Technologies elements that will be integrated into the show in the next few months. The water bees are



autonomous boats with a fountainhead system that move in pre-programmed sequences, while the bridge is simply a massive bridge. “It’s 23m (75.4’) long and 5m (16.4’) wide with a single 50-ton winch, on what is basically a drawbridge,” remarks Malone.

Theatrical winches aren’t usually that large. Ager explains: “We usually do winches up to four tons; that’s the biggest we’ve done to date. They came in with this request, which is effectively over ten times that amount.” Malone adds: “It’s a capstan winch, probably the size of your living room, with four 40mm (1.57”) steel wire ropes running down through the building. The winch is in the grid, and it runs down through the building, and diverts out to pick up the drawbridge halfway up. The drawbridge goes from vertical to horizontal, so it’s a 90° travel.” As for the speed of the winch, “It takes three minutes to go 90°, but when you’re standing next to it, it looks pretty fast when it’s coming at you.”

Projection

While many who worked on *La Perle* were new to Dragone Studio, video designer Patrick Neys has been working with Franco Dragone for the past 15 years. “I began to be involved with *La Perle* just after the first drawings of the theatre, which was four years ago,” he says. “At that time,

I was working on the creation of Dragone’s Chinese shows, but I was periodically called to discuss, choose, and sometimes define the various surfaces to project on and the number of projectors; I really began to enter artistically into the project and create the video content in the beginning of this year.”

Production began in earnest with Neys and his team at Drop the Spoon in Belgium four months before Dragone began the creation process in rehearsals. “Franco shared with me his desire to have an opening that discussed the origins of life on earth and probably in the universe. For the rest, he let me think of what could be the best way to use and transform the theatre to give the audience a journey through many worlds. Sometimes, those worlds are really obvious and clear, but usually what we like the most is to evoke places or give visual emotions always in a way of illusion.”

Before creating with Dragone, Neys and the Drop the Spoon team created a massive collection of looks and elements. Neys notes: “During four months before the creation phase, we developed a huge library of looks and elements. My biggest challenge, like on every show with Franco, is being able to propose not only enough new material but good content that’s related to his intuition and the universe of the shows he’s creating.”

Neys says he had a variety of tools available when he was building content: “The looks were created so they could be added everywhere and played in real time through the [VYV] Photon media server or our live station, a Mac Pro with Premiere Pro and the Adobe Suite. During this pre-production phase, we were able to visualize all our content in virtual reality within the Photon with Oculus glasses.” Earlier this year, VYV updated Photon to include Oculus VR support with multi-user, 3D visualization within the user interface. As it turned out, the Oculus glasses were an important part of the process. “This was a perfect tool for us to understand the scale, the speed, and the relation between the three main surfaces: the 38m (124.5’) wide by 18m (59’) high curved cyclorama, the whole floor, and what we called the dome.” The dome consists of all the curved fascia panels covering the walls of the theatre.

For projection throughout the theatre, there are 20 Barco HDF-W26 projectors [used for the floor and the dome] and four Barco HDQ-2K40 projectors [used for the upstage cyc]. Montreal-based Solotech provided the projectors and assisted in the installation. “We’re using the Zap Technology yoke, specifically the VIP Dual LX 1500, made by Cinemeccanica. Twenty yokes are used exclusively with the HDF-W26 projectors,” says Anton Montaut, head of lighting and video for *La Perle*. The Zap yokes enable projector movement.

The system includes two Photon controllers [one main and one backup] for the operation of the show and 11 Photon display servers [nine main and two backups, each

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with four HD outputs]. One display server is used for user interface and three for the projectors. Two VYV Albion systems [another main plus backup] manages the tracking, real-time calibration, and volumetric calibration. The Barco HDF-W26 projectors are on the Albion system, which, in combination with the Zap yokes, 40 Albion cameras, and VYV's Copernic infrared emitters, enable the projection system to do real-time tracking.

The spontaneous, live-creation part of the process with Franco Dragone is intense and unique. Ney says, "Franco has always had his own method to create live with all the ingredients he has in front of his eyes; he's always looking for the unexpected. He will probably not choose the sequence you had thought for a specific tableau, but he will wait for the unexpected one. From a video content point of view, of course, it's a nightmare to deal with immediacy, but, through the years, multiple experiences together and thanks to fascinating new technologies, we have developed ways to work and react live in only a few seconds. I've my huge library ready in Premiere and in Photon, operated by Alexis Rivest, and together we jam on the three surfaces from a look to another to give him the direction, the flavor, the base of the tableau where Franco will place the action." Photon's playback infrastructure is based on uncompressed video, which allowed Neys to edit and apply effects to the content, without having to spend time rendering the sequences.

Lighting

The original lighting design was done by Enrico Bagnoli, who brought in Claude Plante as his assistant designer; Plante then became the lighting designer after Bagnoli left. "I met Enrico 18 months ago in Brussels," Plante says. "The design was already done by then. The initial lighting design was in conjunction with the first draft of the show, and we had to change a few things around. When Franco came in and took over during rehearsals, he wanted other things from a lighting standpoint, and other elements were brought into the show."

The theatre is home to a wide variety of lighting positions. "There is a round truss right in the center, over the pool. At the dry stage, there is a curved truss as well. There is a catwalk above all along the wet stage, it is 360° all around, so there are positions there," he says. There are four coves with lighting positions; there are also five vomitories; one is 85' high [for the bridge], and is the location of a small truss, while the others are de facto balcony rail positions.

The rig includes numerous automated fixtures, all from Claypaky. Plante adds, "The Alpha Profile 1500 and the Supersharpys are the workhorses. The majority of the 1500s are on the catwalk above the wet stage and the core of the Supersharpys are on the curved back truss, over the cyc; they work a lot and were really helpful."



The vomes are home to Claypaky A.leda B-EYE K-20s. "They are very helpful in washing with the deep colors," Plante says. "We also use them for effects. There is a lot of video in the show, and sometimes, lighting is only a little support for the video, so those were really, really useful." The vom positions also include Sharpay Wash 330s and Alpha Profile 800 STs.

The floor package includes protective scenic bubbles, custom-made for APF by a local manufacturer. "There are bubbles all around the pool with instruments inside them; because of the water, they have to be protected," Plante says. There are Claypaky Alpha Profile 800 STs, Claypaky



The nearly 20'-tall puppet, created by Roger Titley, requires one operator above and six below.

Supersharplys, and Claypaky A.leda B-EYE K20s located inside the bubbles on the floor.

The rig also includes products from another Italian manufacturer. "We have the T-Color [RGBW/FC] from Studio Due," Plante says. It is rectangular IP-65 rated fixture with 60 high-intensity RGBW LEDs, with several accessories, including barndoors and various lenses. [Studio Due products are distributed in the US by Techni-Lux.] "There are 14 on the bottom of the cyc. We also had 14 on the top of the cyc that we decided to take out. The cyc is so huge, and it was mainly treated with video, so it was a waste of instruments there. We changed those locations and put

them at different levels in the house to light up the walls. For the aerial numbers, at low level, they are very helpful."

The *La Perle* lighting package also includes 50 Studio Due Slimbar RGBs; 28 Claypaky GlowUp Strips 100, LED bars with an adjustable 14° to 70° electronic motorized zooms; and eight Claypaky Stormy CC strobes. All are IP65-rated. Finally, the rig includes 12 Claypaky GlowUp C fixtures, which are compact, portable, RGBW LED units, with built-in batteries that can be recharged 2,000 times without capacity loss. While some lighting was sourced directly from the manufacturers, many units were provided by Oasis PPD, of Dubai.



The waterfalls at stage right/left could have been problematic in terms of audience exposure, but the air currents in the theatre keep the audience dry.

The show also features a number of gobos, purchased directly from Rosco. “Franco loves gobos,” Plante admits. “We had to change them a bit; we brought in some specialty gobos, especially for the floor, where they could mix well with the video. There is one Franco particularly likes that was used a lot on the video to make texture to fill in the holes,” comments Plante. For spotlights, there are four Robert Juliat Cyrano 2.5K HMI followspots.

For the water lighting, Bagnoli specified a combination of Anolis ArcSource Outdoor 24MC [131 submersible units] and Anolis ArcSource 7 RGBW [ten]. (Anolis is a division of Robe Lighting that makes architectural lighting products.) “The ArcSource 7s were really helpful to get anything that was above the center well, because it is very, very powerful, even though it has to go through water,” Plante notes. In all, there are over 400 lighting fixtures in the theatre.

Programming was done by Plante, Stephane Lecavalier, and Nathan Files; they worked on two MA Lighting grandMA2 full-size consoles. “During the whole time that rehearsals were going on, we had two consoles,” Plante says. “I was sitting behind a console, in case I had to do something fast. I had to work directly with Franco most of the time, so it was better for me to be able to respond to him.”

Because the show is so projection-heavy, Plante says, “Lighting complemented the images. Franco loves the projection, and for him, the projection tells the story. If you

compete with that, you’re missing the point of what he wants.” The lighting control package also includes two MA Lighting 8Port Nodes, two MA Lighting 4Port Nodes, six Doug Fleenor Design enhanced five-port DMX512 Isolated Splitter/Amplifier, and a Goddard Design MiniDMXter4 DMX/RDM for RDM management.

Plante says, “Franco wants to ‘shake’ as much as possible. He’ll throw in an idea, and video, lighting, sound, and special effects have to throw in something. He then takes bits and pieces and makes a show out of that. Basically, Franco is collecting looks and we can do as many looks as he wants, and then he picks from them.” This process takes weeks. “Any one look, which corresponds to a specific number, might not be where the look ends up when we finally present the show. It might be something that was originally for another number, but he liked that, and moved it.”

Part of that “shaking” includes the color palette, Plante says: “We just sit down with him [Dragone] and see what happens. If we had to throw some green, we did, because that was helpful at the time. It’s very instinctive; he works in the moment. If you give him ten ideas, he’ll take one or two or maybe none, and that’s what works for him at that moment.”

Working in conjunction with the lighting rig are Kvant lasers; specifically, eight Clubmax 6000 FB4Ws and one Atom 20. Marcoullier says, “Mr. Dragone was looking to work with lasers for a long time, and this particular space



Franco Dragone defines the color palette during the “shaking” process of live creation.

enabled us to use a small quantity of small units, which created a bang for the buck. We go from normal, out-of-the-box laser imagery for that type of machine and then we created our own images to make the water twinkle or to highlight some performer or edges in the scenography.” The laser design and programming were handled by Steve Critchley.

Sound

For the sound design, Dragone turned to Sebastian Hammond, who was part of the audio team on Dragone’s *The Han Show* in China. “I think the biggest thing that these shows require is flexibility. The system needs to be immersive and flexible in terms of what we can create for Franco Dragone during the creation phase,” notes Hammond.

The overall brief was straightforward. Hammond explains: “Initially, we always have to make sure that we meet the coverage needs of the theatre and there is a consistent experience for each patron; each one of Dragone’s theatres are completely unique in its design so each theatre delivers different challenges. After addressing coverage, we look into options for imaging and effects.”

For the main PA, located over the wet stage, Hammond is using an L-Acoustics PA provided by Solotech. “The audience is split into two halves, which is house left/house right,” Hammond says. “Each side of the house has three line arrays to make up the main PA.” In

each hang are six L-Acoustic KARA cabinets; their trim is 39.4’. “In these line arrays, we also have a SB18, which is the single 18” L-Acoustics sub located on top of the array. I think subs integrated with the line arrays like this are fantastic, whether it be for effects or drums; we can make a much bigger image with that array.” The main PA also includes 10 L-Acoustic SB28 subs. “The main sub arrays are located in the center of these three arrays working as a central radiating source, and this is the main sub energy for the PA.”

Within the proscenium are six Karas and one SB28 per side. “A lot of video content and action happens on the cyc and the dry stage as well, so the proscenium system allows us to bring focus over to anything that is happening with the video content, scenic elements, or the artists,” Hammond says.

Two of the newly released L-Acoustic SYVA are used within the soon-to-be-seen scenic bridge. Hammond notes, “Syva worked as a perfect solution for the image I needed, because of the cabinet’s size—we were able to fit it into the architecture of the bridge while still delivering big sound.”

This is Hammond’s first time with Kara. “It’s a fantastic-sounding box, and I’ve been really, really impressed with them,” he says. “The Karas are IP55-rated. Basically, they are protected against ingress from water jets, which is particularly useful in this environment.”

Hammond got to test the water rating personally during

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rehearsals. “We had our house-right center array get completely drenched. A rain nozzle got loose and out of focus; it went full pelt directly into the front of the array.” He decided to contact L-Acoustics directly. The company’s advice? Just let them dry. “And sure enough, there were no issues at all. The next morning, I ran [Rational Acoustic] SMAART [test and measurement software] through the system and everything was like new. If it was any other system, the whole array would have been gone.”

Amplification is via L-Acoustic LA4X [four total] and LA8 [15 total] amplifiers, located in an HVAC-controlled room. Hammond adds, “L-Acoustics Network Manager was great; it easily looked after all of the processing we needed in terms of EQ and delays.”

Front fill is covered using 24 Meyer Sound MM-4XPs. Hammond says, “There is a front wall which divides the audience from the stage, and these MM4s are concealed inside the wall, so you can’t see them; they’re obviously ideal because they’re compact, and they can also handle

water if they do get wet.” Power and signal is via nine Meyer Sound MPS-488HPs, located in the main rack room.

“For surrounds, we have Meyer Sound UP4-XPs; there are 32 of these that are concealed in the rear wall of the theatre. Almost every 2m [6.5’], there’s a UP4-XP in the rear wall to make sure there is even coverage for these last four rows of the theatre,” Hammond says. There is a second row of surround cabinets as well; these are L-Acoustic XT12s. Hammond notes: “We have a ring of ten XT12s; they extend the coverage of the surround effects further into the house for the people sitting closer to the stage. That ring runs from proscenium house left all the way to the proscenium house right.”

As for stage monitors, Hammond says, “We have eight K-array Python KP102s. K-array specializes in miniature products, which give us much more flexibility; these are used on the dry stage and a few other locations to make sure the artists can hear the music and everything they



The Wheel of Death uses two Tait Stage Technologies CH:I variable-speed intelligent hoists.

need to keep in time. The Python KP102s have been ideal, not only for their size but also because they're water-resistant as well, which is key." Four K-array KAN200+ Anakonda speakers and two Kommander KA84 amplifier/processors are also used.

The center dive pool has an underwater monitor system. "We have three underwater cameras at this point; we also have [three Lubell Labs LL916] underwater speakers," Hammond says.

In terms of control: "For the front of house, we have a [DiGiCo] SD7, and for the monitor console, we have the [DiGiCo] SD10," Hammond says. "We have some complex imaging we're doing with the system, and, with DiGiCo's matrixing, it is pretty straightforward; it also gives us what we need to be flexible with our images around the theatre."

The use of effects is minimal. Hammond says, "I think we're pretty simple right now; obviously, we're using some basic reverbs and delays and things like that. We are using

the Waves Sound Grid, with the SD7 at the front of house, so this has outboard processing available for us for extra effects that we need for the show as it evolves.

"One part of our system is BSS, specifically, the London BLU. This is being used between our consoles and the amplifiers mostly for routing and some processing of the system." Hammond is using a single BSS by Harman Soundweb London BLU-806 signal processor with digital audio bus and Dante and six BLU-160 signal processors.

The production features live musicians and a female singer. "On the house-left artist platform you can see our bandleader, who plays keyboards and also electric mandolin; next to him is our string and flute player," Hammond explains. A drummer/percussionist is located in a nearby isolated drum booth. "We use Audix [D2s, D4s, and D6], AKG [414s], Neumann [184], and Shure [SM57 and Beta 91] on the drums, with Sennheiser [MKH-50 and MKH-800] for the flute and AKG [414 and 451] for the string," the designer says. The female singer is on a



The wet stage includes a 26' dive pool, which the performers surround above.

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DPA d:fine 4066 headset.

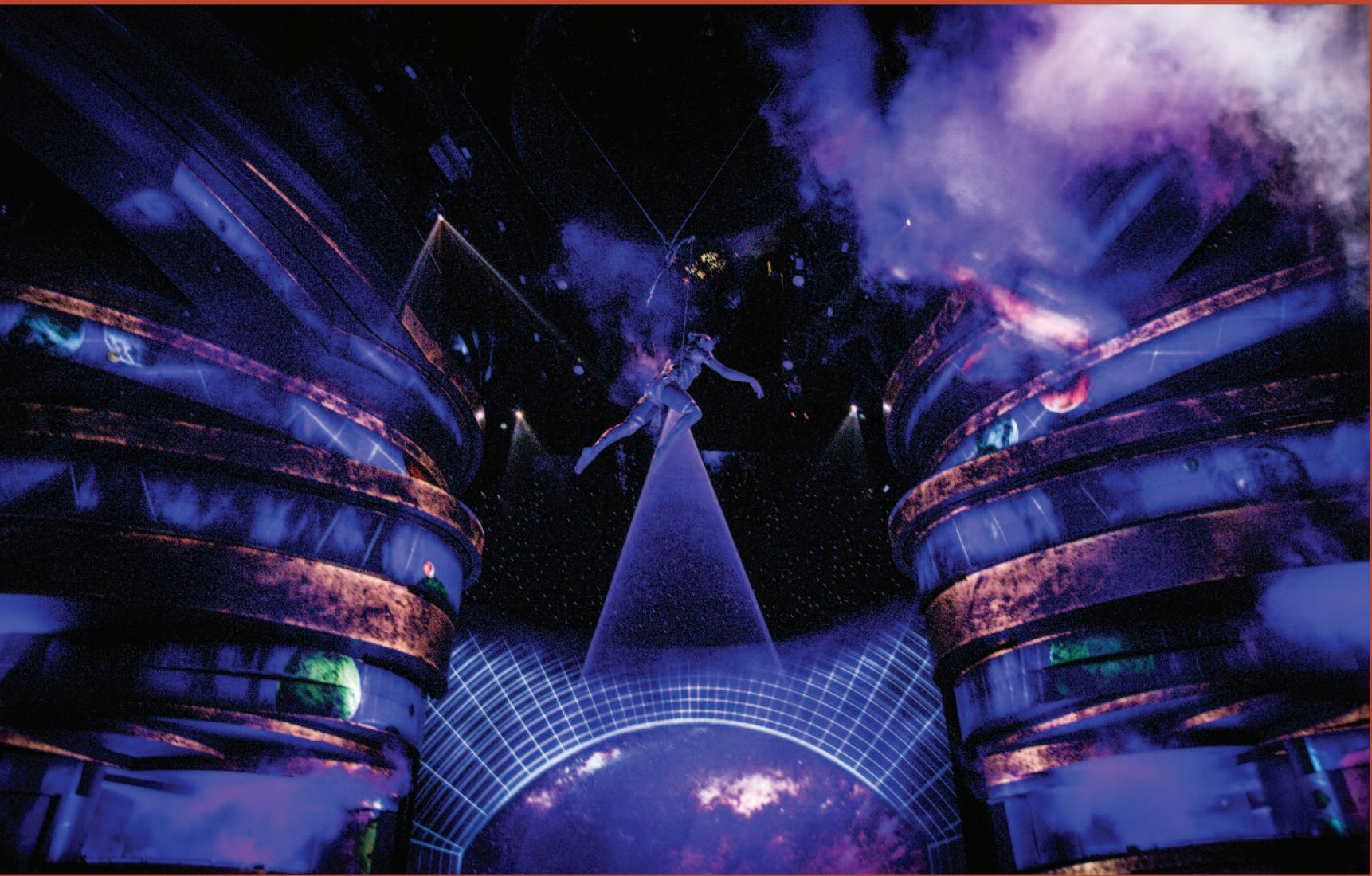
“Like all of our shows, we have the bandleader running Ableton Live software, while Ableton is looking after additional playback of instruments and score to enhance the band. Ableton also takes care of the instruments that are not possible to have, or sounds that wouldn’t be able to have played live,” says Hammond. Ableton is triggering time code for the music, sound effects, and video content.

Also, Hammond says, “We are using QLab at the front of house for any playback; we have two playback computers, a main and backup, that are running simultaneously. QLab can be triggered by time code, which we do during the opening video sequence. During that sequence, our bandleader is sending time code, and we’re able to synchronize the sound effects precisely with the video content.”

From an audio standpoint, the job is never complete. “Now that we’ve finished the creation, the operations team

gets the chance to continue to develop the show and the mix,” Hammond says. “These shows evolve over time with acts, artists, and musicians, so we get a chance to really focus on infinite detail and really strive for the best sound possible.”

This is Dragone’s first show in the Emirates; the last two international Dragone productions have been in China. “I think that it was easier in Dubai,” Marcouiller says. “Dubai, being a trading city, meant that getting goods in and out was very easy. Shipping was very efficient, and we didn’t have any problems with materials stuck in customs.” China also had very specific regulations in regard to using Chinese-made products; those restrictions weren’t in place in Dubai, since they’re not a manufacturing nation. “In Dubai, the civil authorities have been very cooperative. They really understood what we wanted to achieve with this show, and knew that we were doing something in Dubai that had never been done there before.” 📶



The artist fly system includes 20 rigging points, and there are more than 100 rigging points for scenery.

A Setting for

La Perle

As the main story indicates, the theatre consulting firm Auerbach Pollock Friedlander was involved in the design of the *La Perle* Theatre. The project was handled out of APF's New York office with company president Steve Friedlander leading a team that included Don Guyton (project manager), Dan Mei (audio and video systems), Ed Johnson (rigging and machinery), and Brad Kisicki, who was on-site in Dubai for what was originally meant to be a nine-month assignment that stretched out to two years.

The reason for the lengthy overrun, Friedlander says, has to do with the realities of building such a complex and unusual building in an area of the world inexperienced in such techniques. "There is a lot of great construction there," he adds, noting the many astonishing skyscrapers that have reshaped the Dubai skyline. "But theatres are finicky animals and the level of detail in this type of building exceeds any other. In the States, there are contractors who know how to do it and make it work. We made it happen in Dubai but there were challenges because they have less experience with this kind of building."

As part of the firm's process, Friedlander adds, "We educate the architects and engineers [in this case, Khatib & Alami, also hired to do the three hotels and two condominium buildings that complete the complex] about the various things that make theatres theatres. Here the challenges were amplified, especially with the addition of water. One thing we did to assist them was introduce them to JBA Consulting Engineers, from Las Vegas. JBA has experience with this type of project [including many hotel/casinos and performance spaces in Vegas]."

Kisicki says, "The biggest challenge was the fact that there isn't a history of this kind of building in that part of the world. It involved teaching a new language to the general contractor, to get them to understand the nature of such shows—that everything is transient, and everything they put into the building could change tomorrow."

As is often the case when working with Dragone, Friedlander notes that the detailed final show concept was not in place before design work began on the theatre. However, he adds, "There was a sense of the major elements." It was clear early on that this would be a water show, Guyton says, because Dubai, which sits on the Persian Gulf, "once was a fishing village and pearl fishing

was an industry there." In any case, he adds, it is APF's job "to try and ensure that the theatre's infrastructure can support whatever they are going to have, with little or no modification to the building." The original concept design for the building came from Jean Rabasse, after which, Friedlander says, "We took that concept and collaborated with the Dragone team to make it work within the building, especially in terms of sightlines and codes."

One challenge involved acoustical isolation. Friedlander says, "The roof in the theatre is an amenities space, designed for, say, big meals during Ramadan. Because of that, the roof required extra isolation; the roof structure is very robust." This design decision bred new challenges: "The roof trusses are so heavy that they wouldn't erect in one piece. We had to take multiple pieces, weld them, and find a way to construct them on the top of the building, where they would slide into place. There's a 60m span around the roof, consisting of 5m-tall trusses."

Friedlander notes that the project's steel erector, Cleveland, is, as its name suggests, experienced in bridge construction, "so this type of steel project was in their wheelhouse." He adds that the rest of the steel in the building posed additional challenges, since the interior, covered in perforated metal, acts as a projection dome.

The goal was to accommodate 1,250 patrons in an arrangement of seats no greater than 14 rows. "The challenge was the deep thrust, which drove the room to be steeper than is typical," Guyton says. "That and the fact that the building had to fit within the overall hotel structure. A lot of what we do involves fitting theatres into structures in which the elevation levels are determined for another reason. We did a lot of 3D modeling of the theatre room because the sightlines are so complicated. It helped everyone's confidence that the theatre could work."

The pool, which holds 2.7 million liters of water, is designed differently from certain other water shows, where the stage raises and lowers. Here, Guyton says, "Most of the pool is 2m deep, except for the area in the center ring, which is 5m, to accommodate deep diving. There's only 350mm of water above the playing surface, but it requires a huge amount of water to cover the deck." Friedlander says, "There's access below the stage, a swimming channel, for support divers, who enter and exit the deep part of



The Globe of Death, which weighs over 88,000lb, was fabricated using custom stamping techniques now done exclusively in China.

the pool beneath the stage floor.” This design, he adds, requires “lots of plumbing and pumps and holding tanks, to allow the water to be taken out and put back.” APF worked with STO Design Group, based in Santa Ana, California, on the pool’s design, including the quick refill tank, which allows the water to reach the 350mm over-the-deck height in less than 45 seconds.

In terms of the production’s lighting, projection, and audio systems, Guyton says, “We were given fleshed-out equipment lists, along with locations, plans in section, and drawings, and we system and infrastructure design, developing the details of mounting and wiring.” In addition to the grandMA2 full-sizes, which run the lighting, he adds, “We have ETC dimmers and a network consisting of Cisco fiber and Ethernet nodes.” Friedlander says, “It is a really sophisticated managed network with subnets all over the theatre, to prioritize the various signals. Lighting, sound, and video all have separate networks.” Guyton adds, “Special effects has its own network, also with a grandMA2 light front end. Both networks have a number of grandMA NPUs, to increase the address count and make things move more smoothly.” Audio, projection, lighting, and special effects are triggered by separate operators.

As mentioned, the sound system includes L-Acoustics PA, Meyer Sound surrounds, DiGiCo consoles at the front of house and monitors, BSS by Harman processing, an Optocore networking system, and a Clear-Com backstage communication system. Most of the players are located in

a main musicians’ room, with percussion located in its own room. “The rooms, located on the audience side, facing the stage,” Mei says. “Their monitor mix operator is right there, in an adjacent, acoustically isolated room.”

Because of “the massive volume and surface area, there was concern about acoustics,” Friedlander says. “The dome material was carefully chosen. It’s a specific perforation, with a sound-absorbing liner that keeps the dome from reflecting too much. There’s a lot absorption in the room,” including bass traps built at the grid level.

Rigging, Kisicki says, “was particularly challenging. TAIT Stage Technologies installed their biggest winch to date and getting it in the building was a monumental feat.” There are 43 winches in total, 14 of which are acrobatic, with the rest handling scenery.”

Kisicki adds, “We worked to anticipate enough flexibility to accommodate changes to the building that were required for the production. Because of the nature of the subcontractors, it was difficult to change things. It’s not like in America, where contractors are familiar with the ongoing changes to these buildings. To the local Dubai contractors, the challenge was understanding why something needed to change. They are used to creating a set of shop drawings, giving them to the guys in the field, and then they just build it. It worked out well in the end, largely because we spent a lot of time anticipating those changes well in advance and planning for the flexibility.” 📶