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MAGIC IN THE AIR

Reinforcement wizardry for the Bruno Mars world tour.

by Keith Clark, photos by Steve Jennings

BRUNO MARS' 24K Magic World Tour kicked off at the Sportpaleis in Antwerp, Belgium this past March, making a three-month run throughout Europe before taking a brief break and then moving along to North America in July. There's still a long way to go for the arena (and occasional stadium) tour, easily one of the largest of the year in terms of audience size and number of dates, as it next goes to South America and then Asia, finishing up in Perth, Australia next year in late March.

Since bursting on the scene in 2010, Mars has already landed seven number-one singles on the *Billboard Hot 100*, attaining the first five faster than any male artist since Elvis Presley. Accompanied by his band, The Hooligans, he's known for dynamic live performances and showmanship. For their part, the band brings a tight, energetic complement of electric guitar, bass, piano, keyboards, drums and horns, and they also provide backing vocals. A highly accomplished multi-instrumentalist, Mars adds guitar to certain songs in addition to delivering lead vocals.

Clair Global (Lititz, PA and worldwide) is the sound company for all legs of the tour, with head system tech Chris "Sully" Sullivan bringing a laser-like focus to fostering a main PA that can deliver exceptional coherence that's consistent for every performance. (*Sully is also a long-time contributor to LSI.*) He works closely with veteran front of house engineer Chris Rabold to create a holistic approach where system output and coverage are hand-in-glove with the mix.

"Simply put, Sully is the best nerd and the coolest nerd, a system engineer who absolutely knows his stuff," Rabold states. "He's so on top of the design that

it makes our collaboration in optimization and tuning a pleasure. Like me, he treats what we're doing as art. Literally, he translates the science of the modern PA into art. Suffice to say, we work very well together, and that's all for the greater good of what we're trying to present to the sold-out audiences on this tour."

ARTICULATE PRESENTATION

The main system is fronted by left-right line arrays, each comprised of 16 Cohesion 12 (CO-12) modules, and they're flanked by side hangs of a dozen more CO-12s boxes. While the number of loudspeakers in the arrays doesn't vary from venue to venue, Sullivan notes that the inter-angle elements between cabinets do change given each site's particular coverage criteria, determined with an assist from EASE Focus software for prediction.





The latest large-system PA development from Clair Global, the CO-12 is a 3-way, double-12-inch, horn-loaded loudspeaker available with either 80 or 120 degrees horizontal dispersion. The main arrays on this tour include ten 80-degree boxes above six 120-degree boxes, while the side hang cabinets are all 120 degrees horizontal. Smaller CO-8 arrays (12 modules each) serve as rear hangs, extending coverage to 270 degrees, generally located about 40 feet upstage and approximately 110 degrees off 0.

Another key facet of the design is the Clair Global CP-218 (dual-18-inch) self-powered subwoofers that fly, six per hang, adjacent to the main arrays. "The low end produced by the CO-12s is really impressive, particularly in terms of their size," Sullivan points out. "A primary reason we fly the subs with the



Above and on the opposite page, Bruno Mars and the Hooligans in mid-concert form. At left, a talented multi-instrumentalist, Mars adds guitar to certain numbers, and his lead vocals are captured by a Sennheiser wireless transmitter with an MD 5235 capsule.

mains – which I'm a big advocate of – is to optimize the vertical timing between the two (mains and subs) in spaces with multiple levels, like arenas.

"By co-locating the entire main system, we're attaining excellent alignment throughout the entire main listening area," he continues. "Even up in the air with just six CP-218s per side, the low end is very tight and closely matched with the mains. Some were skeptical of using so few subs, but there's low end to spare while the overall signature is super clean and super hi-fi."

Coverage in front of the stage is rein-

forced with CP-6 self-powered point source loudspeakers, another new Clair Global development. Offering a very low profile, they integrate seamlessly into the stage face, rendering them virtually invisible. Also on the deck are two more CP-218 subs per side for a little more “thump” in the extreme nearfield.

The main system is driven by rack-mounted Lab.gruppen PLM 20K44 4-channel amplifiers. All of them incorporate Lake digital processing, which is optimized for the specific criteria prior to each show and can be fine-tuned if necessary. As a result, there’s no need for a master DSP control unit at FOH. The main and side hangs are put within the same general processing group to enhance low-frequency coherence between all of the elements.

The tuning and optimization process, which utilizes Rational Acoustics Smaart, sees the tech crew deploying five microphones throughout the coverage area. Four of the mics travel with Lectrosonics wireless systems that can be easily moved about during the process, while the fifth is a hard-wired measurement mic at FOH that’s also used as a reference during shows.

“The system is highly articulate. The tricky part with any PA is attaining full-bandwidth coherency, and we’ve been



able to get results that are nothing short of incredible,” Sullivan says. “Almost from the outset, even during early production rehearsals, we noticed that the slightest EQ adjustment is quite noticeable in this system. So it’s wide Q, contouring EQ, with shallow amplitude cuts. If we need to do anything larger than that, it’s due to something else, not the PA.”

DELIVERING IMPACT

Veteran FOH engineer Chris Rabold is working with a DiGiCo SD7 digital console

running at 96 kHz that’s he’s utilizing to handle more than 100 inputs via three SD Racks on stage. “It’s a very fast console,” he notes. “I’m doing a million things at once, so that speed is sorely needed. Plus, I can accommodate a lot of requests at once, which is important, and again, I can do it quickly.

“It’s also easy to program offline,” he adds, “and the speed at which you can move things around – particularly in the rehearsal period when things are changing – is fantastic.”

Those factors are all particularly crucial in working with an artist like Mars, who is engaged to a very high degree. “Bruno wants everything that’s in the mix to have impact and meaning, almost to the point where every thing matters as much as the other,” Rabold explains. “So how do you take his vision and pull it back into the realm of reality, where the mix presents the desired result in delivering the impact and punch we all want? That’s the balancing act. It really keeps me on my toes.”

An overview of his approach is a focus on the rhythm section and then topping it with a “hi-fi” signature, one that’s not too bright but revealing of all of the other elements happening on stage.

An outboard rack of effects gear (interfaced with the SD7 via another SD Rack



The main PA arrays comprised of Clair Global Cohesion CO-12 arrays and CP-218 subwoofers.



at FOH) is comprised of tools that Rabold likes to utilize on a regular basis, and he points out that each piece is chosen more for color and tone than for actual dynamic control. A few pieces are put in place exclusively for dynamics control, but they're often in parallel with something else. "At times, I even employ dynamics processors to accentuate a transient rather than trying to reel it in. So the compression aspect essentially becomes a secondary function," he adds.

An API 2500 stereo compressor and a Sonic Farm Creamliner tube-based processor help add some extra weight and muscle to the stereo bus. Meanwhile, the rhythm section is enhanced with Empirical Labs Distressors and Fatsos along with several offerings from Overstayer.

"Modern digital consoles are exceptional tools, so sonically clean and clear, and that's a good thing in terms of providing an open palette," Rabold says. "But sometimes you want to add in a bit of grit to the sound, and we're doing that here with pieces like the ones from Overstayer."

Also in the rack are five channels of Rupert Neve Designs 5045, a primary source enhancer from Yamaha designed to reduce stray noise that can compromise vocals. Rabold applies it to both background vocals as well as situationally with Mars' lead vocal.

"With the four background singers, it really helps clean things up," he says. "With Bruno, it does the same thing in terms of vocal clarity, but it depends on the song and situation. If the mic is further away, the process isn't nearly as effective, but when he's really on the mic, it makes a big difference. So I apply it as needed."

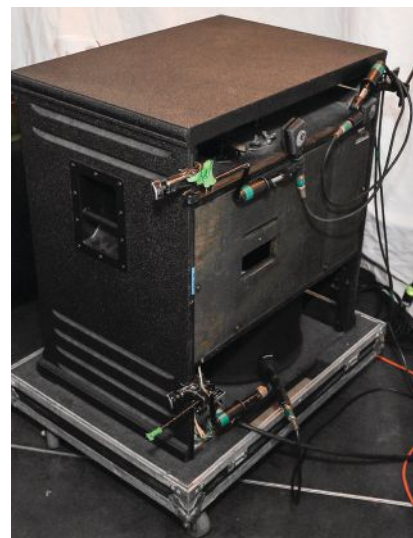
FOCUS ON THE STAGE

Rabold and monitor engineer Ramon Morales also work closely together, as well as with the musicians, on microphone choices. All vocals are on Sennheiser Digital 9000 wireless systems, with the transmitters of the background vocalists outfitted with prototype capsules affording a narrower pattern that helps with rejection of extraneous noise. Mars stays with the Sennheiser MD 5235 capsule he's been working with for several years. The tour has also been evaluating the recently released Sennheiser Digital 6000 wireless system with positive results.

Regarding drum mics, Rabold says, "There's a collection of the usual Shure suspects here and there. We also have Mojave Audio MA-201s for overheads, while MA-101s see use on hi-hat, ride and snare. They're killer mics; we really like them."

Guitar amps are handled with a combination of Audio-Technica AT4050

Left to right: FOH engineer Chris Rabold with his DiGiCo SD7 and outboard racks, followed by a closer look at what's in the racks. (By the way, he's also employing a Digital Diablo live recording system on the tour.) Next up is monitor engineer Ramon Morales in his world, also headed by an SD7. Below is look at the miking approach for the Leslie cabinet.



large-diaphragm condenser mics, Shure SM7 dynamic mics, and Royer Labs R-122 Live active ribbon mics. All direct sources are taken via Radial Engineering DI boxes except for bass, which is handled with an Avalon U5.

Morales is another veteran of large-

scale touring, with more than 20 years in pro audio and 15 of them serving as a monitor engineer for the likes of Beyoncé, Lady Gaga, Mary J. Blige, Mariah Carey, Pitbull and many others. About specializing in mixing monitors, Morales, who also enjoyed a recent stint at FOH for Ricky Martin, notes that “I must be doing something right since they keep asking me to do it. I’ve been very fortunate to move into this role, and have worked with some really great people over the years, present company included.”

A DiGiCo SD7 is also his long-time mix platform of choice, and like Rabold, he’s using it in tandem with three SD Racks. “Input-wise, it’s a ton of stuff as it’s a pretty big band up there, and output-wise, it’s pretty extensive too,” he explains. “When I went to re-do my session structure, I had one channel left for DSP – I never thought I would get to this point, but we’re here. Like Chris, I’m running at 96 kHz, which takes up more DSP, of course, but it makes such a huge sonic difference so I always want to work there.”

He delivers nine mixes to the musicians, each tailored to their particular preferences. Numerous additional mixes are delivered to the crew. There are no wedges or any other loudspeakers for monitoring on stage; everyone is out-fitted with JH Audio earpieces fed by Shure PSM 1000 personal monitor systems that, along with the wireless mics,



Morales' effects rack joined by the tour's Shure PSM 1000 wireless transmitters for monitoring and Sennheiser Digital 9000 wireless mic receivers.



The microphone deployment to capture the drum kit, with Mojave Audio condensers handling several facets.

are under the direction of RF technician Paul Tobey.

“I really like working with IEMs because I can give everyone more in their mixes than with wedges,” Morales states. “It’s a fuller sound, there’s more detail, and there’s more room for tailoring. They want to hear the record in their ears, if possible, and IEM is very helpful in that regard.”

All of his mixes on this tour are pretty full, he adds, and then there are certain things he needs to highlight in each one to the tastes of each performer. As is his usual practice, he started his process well before the tour with an in-depth study of Mars’ recorded work, which helps him “do the little things” that add up to meeting expectations, along with developing good one-on-one relationships with the artists so he can better understand what they’re looking for.

His favorite aspect of working monitors? “It’s dynamic and there’s a different energy during a show,” he replies. “It keeps you on your toes, and it keeps things very interesting.”

SOMETHING TO BEHOLD

As the tour moves along, the team has developed a working rhythm that has become as seamless as possible within

the fast-paced schedule of a world tour. Rabold, for example, notes that Sullivan’s expertise, particularly in terms of system design, has been a much-welcome benefit and has lightened his load in that regard.

“I’ve often said that I put as much emphasis on tuning as I do mixing,” he says, “and the second aspect is meaningless if the first aspect isn’t done properly. With Sully, I know it’s being done right.”

Sullivan closes by pointing out a sometimes-overlooked benefit of being part of a top-notch production: “It’s a high-end, high-energy show that I’ve already worked about 45 times to this point, and yet I still catch myself taking out my earplugs and just listening and watching the gig.

“We’re all working extremely hard, so it’s a nice perk to be able to enjoy the show, and especially this performer, who is so talented and is giving everything he has, every time out. And he’s cognizant of exactly what’s going on with every single element that’s happening. As a result, the band is so tight, they’re stuck to him like glue. It’s a stage of true professionals led by a really talented, brilliant artist.” **LSI**

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