



# ARIANA GRANDE: SWEETENER WORLD TOUR

*Innovative on-stage visuals for the American singer-songwriter's world tour are provided by disguise.*

Comprising 102 dates around Europe and North America, Ariana Grande's *Sweetener World Tour* is well and truly underway, with the final show set for December 2019 in California.

Throughout the tour, disguise 4x4pro media servers and an OmniCal projector-calibration engine have played a key role in facilitating the ethereal, galaxy-themed visuals on stage.

"The tour was designed to highlight the range and femininity of Ariana and create an ever-transforming space for her to perform her latest albums and give the audience an immersive experience to dive into as they witness Ariana's journey through her music," commented Loren Barton, Media Department Director for Lumentech.

Barton has overseen the projection and media departments in support of many recent projects by Production and Lighting Designer LeRoy

Bennett. Possible Productions produced the motion graphics for the show, which sees the stage brought to life with visuals of space during the song NASA – the visuals then turn the stage into a planet, a moon and a galaxy. After consulting with Grande, Michael Figge and his team at Possible Productions created a stage theme for each song that reinforced the choreography and lighting.

"The set is made up of three main features," Barton began. "An inflatable curved cyc wall with a protruding hemisphere in the centre, a horseshoe-shaped wraparound runway, and a descending sphere that inflates fully when deployed.

"Unlike most pop tours, the decision was made early on to use projection as a light and scenic source for the show and have the lighting accent the music, key the dancers, as well as sculpt and feature Ariana with



followspots, balanced to much lower levels than traditional followspots,” he continued. “Another key decision was to project onto the stage floor so, no matter what seat you have in the arena, the visuals and imagery of the show reach you and contribute to your experience of the production. The whole set is a canvas.”

Barton noted that the set design was adapted several times to meet the needs of the production before it was finalised. “The usual challenges of balancing the spatial needs of scenic, audio, lighting and projection took some reconfiguring on-site once we had all of the pieces in the room together,” he said. “Projectors and trusses needed to be moved as the final positions were chosen for the set.”

According to Barton, the biggest challenge was “getting all 30 of the scenic projectors rigged, cabled, focused and calibrated on the three different scenic elements within a standard one-day load-in timeframe”.

He commented: “The tight rehearsal time meant we only had the entire set in one place for about a week. A great deal of research and development to manage the warping and calibration had yet to be completed. As a precaution, we had the inflatable vendor sew in a grid of small markers just below the surface of the objects to be used in our calibrations.”

Once it was apparent that a large part of the scenic design revolved around projecting on 3D inflatable objects, OmniCal cropped up in conversations, making this the first concert tour that it had been used on this scale. disguise 4x4pro media servers along with OmniCal were chosen as the best solution for the show’s complex scenic design.

“Given the short time we had to come up with a tourable calibration plan for these complex scenic objects, disguise’s new OmniCal solution was the best way for us to move forward,” Barton stated. “The entire team is used to the disguise workflow, and we felt confident that we could deliver a repeatable, reliable and robust system that would allow the show to travel around the world.”

Delving deeper into the details of the job, Barton explained: “Our project required two eight-camera machine vision systems working together to calibrate our three surfaces. They were connected to the same

10G network being fed into the disguise machines for processing. This relied on a significant network backbone high above the arena and the ability to focus cameras accurately without being able to reach them.”

Barton’s first order of business was “to devise an OmniCal plan for our curved hemisphere wall object”. He furthered: “For the entire show, this wall provides the backdrop and sets the tone for each song, so it was our most crucial surface. The sphere was hit with an array of six projectors to give us all the angles we needed to cover the nooks and crannies of this irregular object.”

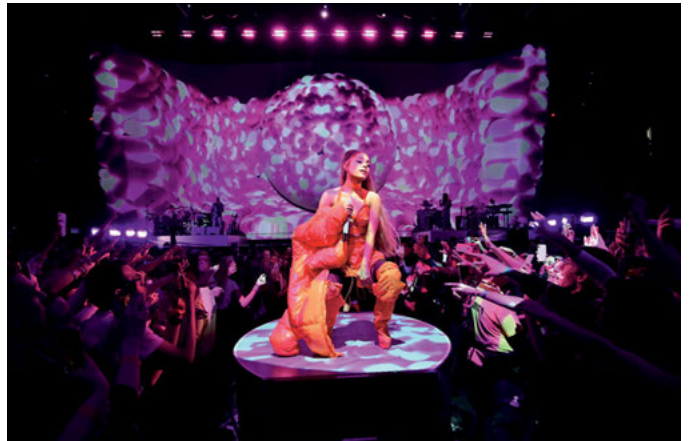
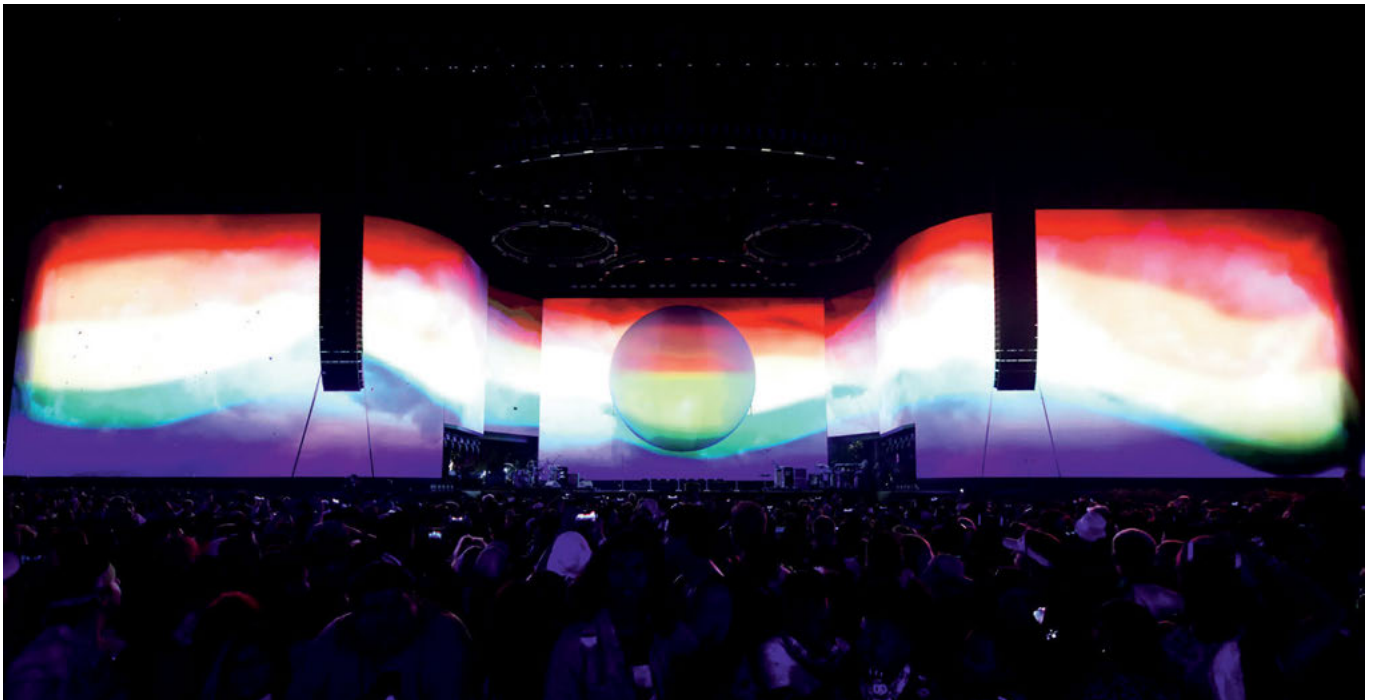
“The next scenic system we worked on was the sprawling horseshoe stage deck that wrapped around the VIP pit and back to the main stage. This object had some relief but was primarily a flat, custom decking system provided by TAIT. We did several tests with cameras in various positions and elevations, testing different calibration settings and adding and removing cameras to our calibration plan,” Barton explained.

“We opted to utilise the natural seams between the decks and project the decking CAD plan back onto the decks to use as a line-up template, and we eventually decided to go with QuickCal for this surface,” he noted. “This worked very well and, once our team was comfortable, calibration went pretty quickly.”

The 9m-diameter inflatable sphere was the last of the scenic elements to arrive at the rehearsal venue and by far the most complex object for projection. “We hadn’t really ironed out exactly how the sphere was going to play in the show or how far down it could or would descend over the VIP pit,” said Barton.

“Once these decisions were made, there were some projection adjustments needed to enable us to recreate the same look reliably from venue to venue. The biggest challenge was calibrating the 12 projectors that hit this object in the 90 minutes or so we had to complete this task each day.”

Barton continued: “After several tests with QuickCal resulted in longer-than-planned alignment times, the decision was made to attempt an OmniCal capture of the sphere. We manually refocused our calibration



cameras and started our capture. After a couple of tries – and some helpful software and network tweaks – a 3D capture of the sphere materialised within the visualiser.

“The first time we played content on the calibrated sphere, it was around 4am and it made the hair on the back of my neck stand on end. We knew we had our solution – it was fortuitous timing as we loaded out of rehearsals later that day.”

With the tour up and running, Loren and his team still had more work to cut OmniCal calibration time to a manageable level each day.

“One of the largest discoveries we made after analysing the data with the touring disguise technician, JM Shulman, and the development team, was that the air handlers in each arena were causing just enough movement in the rigging to cause our cameras and set pieces to not hang perfectly still,” he revealed. “This was causing erratic results and compromising the quality of our calibrations. By turning off all air-handling equipment each day before calibrations, we were able to get far more repeatable results.”

The disguise 4x4pro systems were also key to media control for the show. “As with most disguise

projects we do, SockPuppet ACN control was utilised for controlling the media on this project,” he pointed out. “This allowed for the lighting console to operate the show from city to city and cut down on FOH space

and extra equipment. It helped synchronise the effects and streamlined our programming time.”

Barton was also keen to pay tribute to the people working on the tour. “We were incredibly lucky to have leadership and insights from two of the top disguise engineers, Ben Keightley and Zak Haywood, as we embarked on this journey,” he enthused. “Together we could not have pulled this off without the dedicated support of disguise developers and engineers. We all learned a great deal on this project about what it takes to prove a new product and bring it to market, doing the final stages of testing in a live environment. I’m proud of what we accomplished together.”

He added: “This tour has many ‘never before’s’ that push the envelope significantly for the industry and for disguise.”

**TPI**

Photos: Kevin Mazur  
www.arianagrande.com  
www.disguise.one

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Loren Barton, Lumentech