

# **Metallica WorldWired Tour: Case Study**

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The concert touring industry is financially performing at its highest level in history. A shifting trend from selling records to selling live entertainment experiences has caused a boom in the event production field. This project examines one of the most successful global tours of 2017, Metallica's WorldWired Tour. This tour was able to achieve success with an unconventional stage design. The goal was to enhance the audience experience and interaction with the band. To achieve this, Metallica toured with a roofless stage. This unique stage design proposed challenges for all areas of concert production, including lighting, audio, video, and atmosphere. After interviewing representatives from this tour and researching trends in stage design, this project explores how innovative design can enhance the audience experience, both musically and visually, and identifies solutions for unconventional stage design problems. The Metallica WorldWired Tour is an example of what will be expected for future stadium touring production.

*Key Words: Production, Stage Design, Lighting, Sound, Gantry*

## **Introduction**

This research paper is a culmination of my experience working as a stagehand. I got into this industry five years ago when I started volunteering at music events in exchange for a free ticket. I am now filling up my schedule working on many different shows on the West Coast, and I plan to continue to work in this field when I graduate. What impresses me about this industry is the precise engineering, the quick turnover of shows, and the importance of organization and planning when it comes to putting together a successful event. This paper will identify what makes a successful tour, and will also feature a case study of Metallica's WorldWired Tour. Metallica has been touring for more than 30 years, and their current tour -- The Worldwired Tour -- is their biggest production ever. Metallica is known for having an innovative stage that brings the audience into the show. A production of this size, Metallica's largest of all time, produced many technical challenges. This case study identifies solutions to the challenges faced by this production crew, and provides information that can benefit future world tours.

## **Background**

When Santa Clara, CA was announced as the host city for Super Bowl 50 in 2016, the Bay Area rock legend band Metallica seemed like an obvious choice for halftime entertainment. However, NFL representatives deemed the band 'too heavy for halftime,' and instead, Coldplay and Beyonce were selected to play the event. While this decision disappointed some fans, it gave Metallica an opportunity to design and produce their own stadium show to coincide with Super Bowl weekend. Aptly named 'Too Heavy For Halftime,' This event was scheduled to take place the Saturday night before the Super Bowl at AT&T Park in downtown San Francisco. This sold-out show was a

resounding success, and Metallica took this exact stage on tour in 2017 (Braun, 2017).

The current financial climate of the concert touring industry strongly encourages bands like Metallica to invest their resources into stage production. Physical album sales have dropped 60 percent since 1994 (Christman, 2016), largely due to the global adoption of online music streaming sites. This has forced musicians to find an alternative source of income from record sales. Musicians now sell experiences in the form of live performances. This trend has caused a boom in the event production field. Overall, the top 50 tours in North America saw ticket sales increase by 13.5 percent from 2015 to 2016, according to Pollstar, a global event database. "Employment opportunities in the live-music industry have never been better," says Pollstar editor Gary Bongiovanni. "While record-company jobs have nearly disappeared, road- and tech-production-crew gigs continue to grow." 2016 was also a record setting year for the industry, and 2017 is projected to exceed 2016's gross income totals (Bongiovanni, 2017).

With the emphasis now on live production, the key component to the success of the band is the stage structure. This temporary structure is constructed to support sound, lighting, video, and atmosphere elements for the show, as well as the performers themselves. For many musical groups, their primary source of income is touring (Calvert, 2013), so there is pressure on artists to tour in as many cities as possible. Because of the numerous locations and travel required between tour dates, this stage structure must be constructed with modular components that can be "erected, dismantled, trucked, and re-erected dozens of times" on a major tour (Lynch & Gossen, 2011). These performances demand professional production crews, constantly pushing the boundaries of creativity and magnitude for live events. Major beneficiaries of this trend include the major production companies specializing in specific systems involved in a live event, and their collaboration to make the worldwired tour possible.

### **The Future of Event Design: Open Air and Audience Engagement**

Back in 2003, Metallica's Production Manager and Chief Architect, Dan Braun, began playing with the idea of "eliminating the generic box" that is standard in the concert industry. A typical concert stage is 84 feet wide and 64 feet deep, with a roof structure 51 feet above the stage deck. (Lynch & Gossen, 2011). This box-like structure is standard in the industry, and nearly all major tours use this stage design. However, this box-structure can detract from the uniqueness of a live performance, and Metallica frontman James Hetfield had been talking about breaking away from that "box" since 1992. "Too Heavy (for Halftime) was another step in that journey" said Braun. "My goal is to eliminate as much separation between audience and band."

Representatives from Tait Towers, an engineering firm based in Lititz, PA, and Stageco Group, an international stage production company, met with Braun in September of 2014 to discuss how to open up the box. They began the initial planning of the new structure, knowing the event would be a stadium show, with the end goal of taking the stage on tour the following year. Stageco Project Manager Jon Hawkins says their main goal was to "supplement what artists do." In this case, Stageco provided all the stage decking and towers to make this idea a reality. Stageco Provided 16 trucks worth of material, and 13 touring supervisors for the construction process.

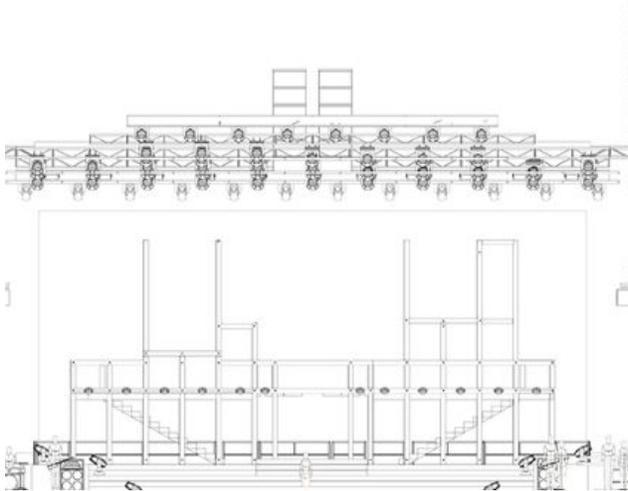
Braun decided to eliminate the roof structure of the stage. According to Braun, the roof is obsolete from protecting the band from the elements. The adaptation of wireless technology such as the ARX-900 by AirNetix, now allows band members to safely play in the pouring rain, and, according to Braun, "If it rains, everyone is getting wet anyway, roof or not." This unconventional design allows for more space for production elements such as audio and video to stand out, but also poses significant design challenges for these departments.

## Structural Stability

The design of the stage is a key component in evaluating the structural stability of the stage. ASCE 7 Stability Standards are consulted by engineers in the design phase. However these standards apply to “roof with three closed sides,” and the WorldWired Stage does not meet this criteria. Instead, the stage is evaluated under a different set of standards, ASCE 31-02 “non-building solid freestanding walls.” Wind loads of the tower truss structure are individually computed. ASCE 31-02 requires structures to withstand “hurricane force winds,” which are the equivalent of 150mph. However, because these structures are only standing for a time period of less than six weeks, a 0.75 wind reduction factor is applied to the structure, so this stage is able to withstand ( $150 \times 0.75 = 112.5$ mph) winds (Spires, 2017). All structures are individually evaluated for rigging loads on the overhead truss system. The 175SF video wall acts as a sail in a wind. To negate this force, a heavy steel base frame was used to increase the structural stability of the stage.

## Design Challenge: Roofing

The main function of the roof structure is to support suspended show effects, such as lighting and video. The roof features a truss structured lighting grid. This grid is engineered to support the weight of any light fixtures or video panels that will hang above, and project down on the stage. Braun needed to find a way to adequately light the band without the above lighting grid. Braun consulted lighting director Rob Koenig to solve this problem.



*Figure 1: Example of roof-supported lighting grid*

Koenig’s design featured two additional structures to provide necessary lighting in front of and behind the band. Koenig proposed the addition of a gantry structure in place of the roof. The gantry was constructed of truss, and formed a bridge 65 feet above the band. The spacing in the gantry truss created a space for light fixtures to be placed, in the absence of the traditional lighting grid. The truss structure was chosen to match the overall theme of the stage, and industrial design, painted white to match recent album artwork. This gantry allows for hanging lights to illuminate the band from behind.



*Figure 2: Example of a Standard Gantry Truss*

To illuminate the band from the front, Koenig collaborated with the audio production department, to add lighting components to the delay towers. A delay tower is a structure located in the audience where the primary function is to hang a line array of speakers for the crowd in the back of a large show. Four truss-supported spotlight platforms were added to the front of the delay tower to provide a location for spotlights and spotlight operators to illuminate the front-side of the band. The combination of the gantry and delay towers provided the same lighting effects without the traditional roof structure lighting grid.



*Figure 3: WorldWired Tour delay tower with four spotlight platforms*

## More Video, Less Empty Space

The production on the “WorldWired” tour utilizes a vastly different approach to stage design compared to what Metallica has done in the past,” according to Rob Koenig, This tour features the most square footage of video wall that the band has ever used. The purpose of this was to “take the energy that the guys are driving onstage and get it to the kids in the back.” In a stadium tour, the “kids in the back” can be up to one thousand feet away from the band. The purpose of these five massive video panels is to emphasize the live performance of the band. At certain times, each panel can broadcast one band member in action. This allows for those in the very back to have a clear view as to what is going on on-stage. Video is the focal point of this production. This forced Koenig to design his lighting to supplement the video wall. This was a tricky design for Koenig. He had to plan his design around the 6650 square foot video wall, carefully selecting each light fixture to supplement what was occurring on screen and on stage. Koenig’s design features 54 Axioms placed on vertical ladders in-between five 35’ x 38’ video screens, with nine fixtures on each ladder. He used a versatile hybrid lighting control council, which allowed him to program lighting to coincide with the video wall.



Figure 4: *WorldWired* stage brings the audience closer to the bands performance

## Design Challenge: Audio

The elimination of the roof also removes the traditional place to hang PA (loudspeakers facing the audience). The solution was to “add more delay towers.” (Braun) This tour featured three delay towers instead of the traditional two. The sound from these towers is calculated to match the time it takes for the sound to travel from the mainstage to the location of the tower. The biggest portion of the audience in stadiums aren’t on the floor; they’re on the sides” according to Metallica’s Audio Engineer Mick Hughes, “all down that long way until the PA meets the delays. So the outer hangs are actually bigger than the 18-deep main hangs, and they are higher, to cover the height of the audience seating area. I think we’re at 22 deep on the sides and we could probably be at 24.”

He is referring to the number of loudspeakers hung per tower. Meyer sound provided all audio equipment for this tour. This tour was the debut for Meyer’s new linear line array loudspeaker, the LEO, and the LYON. These towers

and hangs are adjusted specifically for each venue. Speakers hung in the same direction create a louder sound. This is common in open-air stadiums where the audience can be up to 1000 feet away from the band. Speakers hung at an angle are meant for areas of the venue closer to the stage such as the front “pit” of fans, or a smaller arena venue.



*Figure 5: The three delay towers constructed at CenturyLink Field*

## **On Tour**

Tours of this size require more labor than can reasonably go on tour with the band. Rhino Staging is a nationwide company and accepts labor requests from Metallica for individual cities. This is a three-day build, having local crews work on individual dates allows the band to increase the number of shows they can produce over the summer. Flooring, barricade and other various venue prep activities can be performed by local stagehand crews before the Metallica tour rolls into town. This allows the build process to begin immediately when the trucks roll in. This Metallica show required 66 stagehands for the build and 90 for strike. Rhino receives a request for labor for each department required for build, strike, and show call. While stagehands work on the ground, and can be directly instructed for nearly all types of work, riggers work at height and thus must be able to work independently. Riggers are considered a higher level of labor as they must be trained to work at higher elevations, pass a fall protection certification, and are trained by Rhino specifically for their job.

Production elements are unloaded and put into place by local stagehands. These production materials are transported by Chicago-based company Upstaging. Upstaging specialises in trucking large event production gear, and provides crew and cases to keep the gear protected. On this tour, Upstaging collaborated with Engineers at Tait Towers to provide tour carts custom for this stage. Each cart is color coordinated per department, and features simple construction instructions for any local stagehands unfamiliar with the product. An example of this is the

color-coordinated and numbered video carts. When organized, the carts align exactly where the video wall will be, which allows riggers to quickly put each video panel in to place.



*Figure 6: Metallica Posing in front of their WorldWired Stage (Courtesy of Jeff Yeager)*

## **Conclusion**

The concert production industry is financially performing at its highest level in history. The main goal of Metallica's WorldWired Tour was to increase audience engagement with the band during the show. The WorldWired tour utilized a unique open-air stage design to deliver a crisp and personal performance for hundreds of thousands of fans from May through September 2017. The elimination of a traditional lighting grid required production departments to collaborate to produce a professional quality show. Lighting elements were added to audio towers, and a gantry structure was utilized above the video wall to hang lights above the band. Engineers at Tait and Upstaging created a packaging system specifically for this tour which allowed for the quick installation of lighting and video elements. This production featured new products and design that will be used as examples to have success in the upcoming tour season.

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# Contributors

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Flooring: EPS America

Lighting: PGP and Syncrolite

Video: PRG Nocturne

Audio: Pro Media Ultra Sound

Lasers: ER Productions

Pyro: Pyrotek and Pyro Spectaculars North

Power: Legacy

Barricade: Mojo

Radios: Road Radios

Trucking: Upstaging and Fischer Trucking

Local Labor: Rhino



Steal Load-In Day 1

**STAGSCO**  
STAGING GROUP





Steel Load-In Day 2





Production Load-In Day 3

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