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NATIONAL CONSTITUTION CENTER

National Constitution Center transforms *Freedom Rising* into total immersion theater.

CHALLENGE

To convert the National Constitution Center's 14-year-old centerpiece attraction into the world's only truly integrated, *seamless* 360-degree video, 14-channel surround sound production while retaining every word and virtually all the still images and full-motion video clips used in the original production.

SOLUTION

Custom installation of 10 single-chip Panasonic PT-DZ870U WUXGA resolution projectors to seamlessly project a 360-degree image, while automatically adjusting for color and brightness variations. Use of five Panasonic PT-DZ10KU three-chip projectors for color and luminance-matched imaging on a five-sided translucent scrim which drops from the theater ceiling to floor level. In addition, a single Panasonic PT-DZ10KU projector is deployed to project full-motion video on the theater floor.

RESULT

According to show producer Donna Lawrence, the new projectors draw viewers more deeply into the story, engaging them with a "depth, brightness and vibrance in the imagery not visible before."

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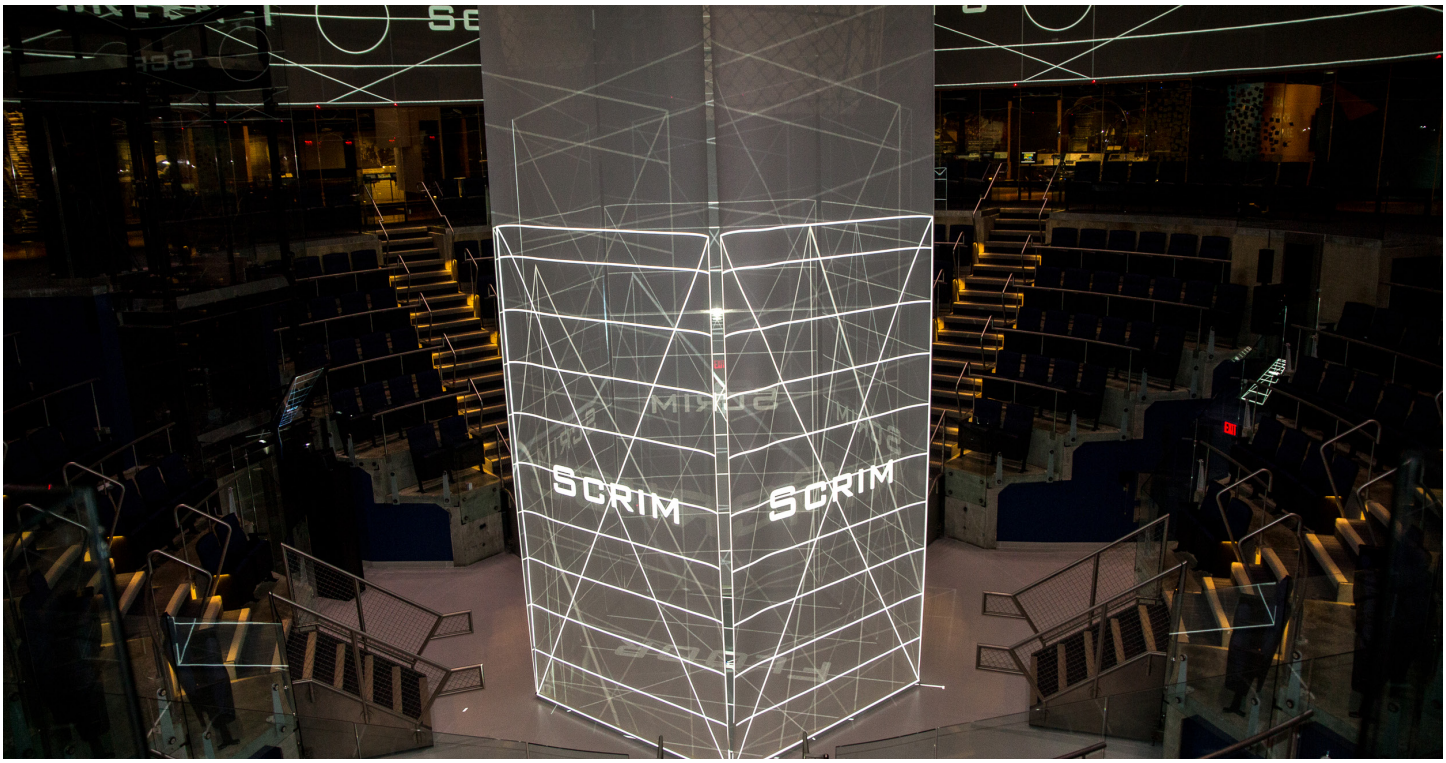

Since the day it opened on July 4, 2003, Philadelphia's National Constitution Center, the only institution in the world chartered by Congress to "disseminate information about the United States Constitution on a nonpartisan basis," has always featured the multimedia theatrical production *Freedom Rising* as its centerpiece. The award-winning *Freedom Rising* is a 16-screen multimedia performance featuring a professional actor and is the first stop on most visitors' tours of the museum. By the mid-2010s, however, it had become obvious that while the brilliance of the show's story remained undimmed, the technology used to help tell that story had not.

Nora Quinn, the National Constitution Center's Director of Theatre Programs who carries the responsibility of artistic direction of all of the Center's theatre programs, has been one of *Freedom Rising*'s major decision makers since before the museum's official opening on July 4, 2003.

A key participant in the integration of the original staging for *Freedom Rising* and the museum's other theatrical productions, she had, arguably, an even more powerful voice in choosing vendors and artistic consultants for the 2015–2016 retooling of *Freedom Rising*.

"What made us select Panasonic projectors for the newly system and upgrade?" she asks, rhetorically. "As artistic director in collaboration with Donna Lawrence, we needed projectors with incredible quality and image reproduction. We needed projectors that would take viewers for a metamorphic walk through the scenes, to actually 'be there' when something compelling from the Revolution, the Civil War, major Supreme Court cases or some other defining moment in America's evolution was playing on the screens. Of the equipment presented to us, only the Panasonic projectors gave us that."

"Even though I knew Panasonic had some unique image blending capabilities and an outstanding degree of mounting flexibility, I was still astounded by how well Tim Creed (projector integrator and engineer of the complex overhead grid and gantry mounting assemblage holding the 16 Panasonic projectors and many of the theater lights used in the show) and his crew surmounted the challenge of opening everything up by removing the spacers separating each screen to achieve the seamless edge blending required for a truly 360-degree viewing environment."

"I knew Donna Lawrence (CEO of Louisville-based Donna Lawrence Productions and *Freedom Rising*'s producer and show director) would have to open everything up, to electronically expand all the pre-existing video files so they would stretch and blend into the adjacent images without any distortion, blurring or video artifacts, but I didn't worry about that part too much, after 13 years I knew Donna and her team were up to just about anything you could throw at them."

"The effect was electrifying," Ms. Quinn continued. "I knew that the edge blending would have an amazing impact, but what I wasn't expecting was the

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clarity of the images. They had always been dynamic and interesting because Donna had made a fabulous, beautiful film. But now, now that we've switched to the Panasonic [product] I can see depth and detail that just wasn't there before. The audience feels like they can almost reach into the screen from anywhere in the theater."

"I've been in this business for 35 years and these days we use almost exclusively Panasonic products for some very specific reasons," says Tim Creed, Senior Design Engineer and partner at Louisville-based Communications Electronic Design (CED), which provided and installed the projectors. Every time we have a head-to-head shootout with competitors' equipment, Panasonic just plain wins hands down on image quality, versatility, durability and estimated service life.

"They're also very controllable, which is critically important in installations like *Freedom Rising* where everything is automated and timed to the second with the on-stage actor's movements and dialogue. Pre-programmed commands go to the projectors over the video server channels and they're pretty much zero tolerance for glitches. Because the Panasonic [projectors] are designed to excel in this sort of environment we are able to run shows using fewer channels. The result is a less complex control system with far fewer conflict and compatibility issues."

As an example, Creed cites the five-sided scrim that drops 40 feet from the ceiling to the stage floor near the end of the show.

"That scrim uses five projectors depicting the same image, while the 10 projectors making up the 360-degree surround video remain alive showing different images" he notes. "The Panasonic five PT-DZ10K three-chip, dual-lamp projectors we use for the scrims are all controllable through one video channel, which means that the scene appears and disappears at the same instant on each side of the scrim."

"It also douses the five projector lights slowly and smoothly and at exactly the same rate as the scrims go back up to the ceiling. It provides a nice dramatic effect and ensures that the image fades out at a rate that prevents the audience on any side of the scrim from seeing through to the projection lenses on the other side."

"Another thing you can count on is Panasonic's color consistency from lamp to lamp," Creed explains. "They're much closer than projection lamps from other vendors and that's ultra-important when you are stitching images from two different projectors together."

"The Panasonic lamps also decay at virtually the same rate which means that the intervals between lamp changes, which saves money and retains the quality of the viewer experience over the entire life of the lamps."

While echoing Tim Creed's comments about the "backstage" advantages of Panasonic projectors, Steve Shiekman, National Constitution Center Senior Operations Manager, who manages the quality control and maintenance teams that keep *Freedom Rising* running full bore, 14 times daily, 362 days a year, is quick to point out that there is much more to the National Constitution Center than *Freedom Rising*.

"Some people come in right when the museum opens and spend hours doing everything, reading everything, touching everything, listening to the entire content of the audio-enhanced exhibits, and letting all the hundred-plus interactive presentations play until the end," he says.

According to Nora Quinn, "we're not like a traditional theater with two shows a night and maybe an extra matinee on the weekend. We put on 14 shows a day, sometimes even more if the museum is hosting a special event in the evening, and we have exactly eight minutes of turnaround time between shows to fix what has to be fixed."

"Prior to changing over to Panasonic, we had to be up on the gantry almost constantly checking on noisy fans, changing bulbs that had suddenly gone yellow and generally performing constant maintenance tasks. With the Panasonic [projectors] there's virtually none of that."

Creed notes that he used Panasonic projectors for the Kentucky Derby Museum's seamless surround screen theater, similar to National Constitution Center's production without the complexities of descending scrims, floor projections, and a live actor, and "the projectors didn't require any specific modifications or compromises even though their screens are arranged as an oval not a circle."

Immersive as the technology is, however, as compelling as the graphics may be and as emotionally moving as the script indisputably is, none of those things are the stars of this particular show. The star is "Freedom," a uniquely American brand of freedom, a brand of freedom that is made possible by the U.S. Constitution.

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