
Raising the Bar for TV Set Design

Meeting the high expectations of a New York City TV studio means designing an unprecedented panoramic video backdrop that projects a seamless image onto a large concave screen.

By Tom Zind



This panoramic rendering of the WNBC News Channel 4 broadcast set shows the entire 26-foot curved screen, which is located behind the newscasters.

Challenge: Deliver real-time, high-definition video to a widescreen display backdrop located behind a news anchor desk in a small corner of a TV studio.

Solution: Design a system using a custom, 182-square-foot concave screen, multiple rear-projection projectors, large mirror sleds, and edge-blending, image distortion-correction, and video playback components to project a seamless detailed image.

Visual elements have always been the bread and butter of the TV news business. If a story doesn't "show," so to speak, it usually doesn't go. And the demand for live images from visual-hungry viewers keeps growing. These days, newscasts increasingly require more and more visual support, often from panoramic video backdrops located behind anchor desks, to convey a sense of "live" coverage in tune with the station's viewing areas. As a result, the bar for defining

cutting-edge AV set design elements continues to be raised.

McCann Systems, an Edison, NJ-based systems integrator, recently faced such a challenge when it was called on to implement the video elements for a new set for New York City-based WNBC's nightly local newscasts in its Rockefeller Center TV studio. For McCann Systems, which has designed AV solutions for CNN's "Paula Zahn NOW" and NBC's "The John Walsh Show," the project was unlike anything it had ever encountered. The unprecedented size of the backdrop, coupled with the need to squeeze the set and its video components into an extremely tight space, made the job seem impractical at first.

"Set designers are always looking for something impossible because they want the coolest thing on the planet," says company President Frank McCann. "No one we had worked with before had done anything quite like this, but we certainly didn't want to tell them we couldn't do it."

After getting the okay from the client to pursue a possible solution, McCann moved quickly to design a feasible AV concept — without a signed contract. Working with the set designer, the firm contracted to shoot the skyline video, and AV equipment manufacturers, McCann mapped out its game plan.

Addressing the size of the projection screen soon became one of the project's greatest challenges. Because no off-the-shelf product could meet the client's need for such a large screen, McCann turned to Stewart Filmscreen to create a customized, curved, semi-rigid, acrylic screen measuring 26-feet wide by 7-feet high. The 182-square-foot screen, which cost about \$30,000, was made with a special low-gain (0.57) coating designed to reduce the appearance of seams between images thrown from multiple projectors.

Once the main backdrop was secured, McCann worked to design the critical, behind-the-scenes elements needed to reliably deliver video to the screen during nightly newscasts. Pending proof that the novel design concept would work using a successful mock-up of the set staged in McCann's warehouse, McCann arranged contingent purchases with suppliers to acquire the necessary components.

McCann used four Christie Vista 3 DLP projectors at the heart of the video delivery system. But because WNBC needed to project high-density images without distortion onto the curved screen from a restricted space behind the set, the projectors were equipped with short-throw lenses. Jonathan Shor, McCann's technical director and manager of the project, says the company also aimed the projectors away from the screen toward large, sled-mounted mirrors, custom-designed by Custom Display Solutions, to properly reflect the light to

the screen.

Shor says the company also used two Panoram PanoMaker V digital image processors, which are designed for use with curved screens and DLP projection, to provide distortion correction and edge blending to combine images from each of the projectors using a 31 percent overlap. Housed in an equipment rack behind the set, the units perform the geometry correction after the VGA (640x480) resolution images are up-converted to SXGA (1280x1024) using an Analog Way SMS100 Smart Scaler video scaler/switcher. The screen's resulting projected pixel density is 3939x1024.

The video segments Pyburn Films shot of different day and night scenes of the lower Manhattan skyline displayed on the backdrop were encoded into MPEG files in post-production, and each segment was separated into four regions that each make up one-fourth of the backdrop.

McCann used a Visual Circuits DVP Server Pro digital video player, which offers two four-channel video cards to provide the four NTSC signals for playing each of the four video segments simultaneously, to create the appearance of one massive, wide-angle image on the screen. "The unit itself provides the cross-channel synchronization needed to keep the video locked," Shor says. "Four MPEG files are played at 15mbps for optimal picture quality. Because each card maxes out at 40mbps, we only use two outputs per card."

McCann also added a Crestron Pro 2 control system equipped with a TPS 5000 touchpanel to the studio's control room to enable its engineers to manage the projection system. Today, the WNBC newscast features one of the most technologically advanced and reliable set backdrops in the industry.

"In a design-build project like this you definitely need strong technical salespeople who know what it takes to make a particular system work and get it sold before the job of building the design begins," he says. "This was an example of the kind of stuff our technical people love to get their arms around."

By the time McCann installed a system capable of combining digital real-time video of the New York City skyline from four projectors into a seamless, high-resolution image spread across a 182-square-foot concave screen with the aid of mirrors and edge-blending tools, it had succeeded in setting the bar another notch higher. Looking back on the \$450,000 project, McCann says it was well worth the challenge.

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