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TVN TECH



Among the innovations CBS Sports has on tap for Sunday's game at Levi's Stadium (the control room is above) is a combination of CBS's super high-res EyeVision 360 camera system, which gives viewers a 360 degree replay perspective on game action, and its virtual first-down and end-zone lines. "If the situation is right, out of the first-down line or end-zone line we are going to bring up vertically a [virtual] transparent pane of glass," says Ken Aagaard, engineering EVP. "As you revolve around, you can actually see if the ball or the player broke that pane of glass."

By [Phil Kurz](#)

TVNewsCheck, February 4, 2016 10:49 AM EST

Deploying ground-breaking TV production technology at the Super Bowl is nothing new, but who ever heard of glass-breaking technology at the NFL's biggest game of the year?

After this Sunday's game, however, millions of viewers likely will have, thanks to an interesting combination of CBS's super high-res EyeVision 360 camera system, which gives viewers a 360 degree replay perspective on game action, and its virtual first-down and end-zone lines.

"If the situation is right, out of the first-down line or end-zone line we are going to bring up vertically a [virtual] transparent pane of glass," explains Ken Aagaard, EVP, engineering, operations and

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A pylon cam used during the playoffs.

“amazing” high-def video and “cuts in well” with the other HD cameras used for game production, Aagaard says.

To help guard against player injury, the signal from the POV cameras is output via a small USB connector that does not impede the pylon from breaking away when hit.

Small, highly sensitive mics near the pylon are also buried in the turf to pick up game sound near the pylons. “We’ve been able to get some really good audio from those pylons,” he adds.

CBS Sports is sending 12 production trucks to Santa Clara to produce the game. Among them are:

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Overnights, adults 18-49 for February 4, 2016

1		2.2/7	4.		1.1/4
2		1.9/6	5.		0.7/2
3		1.2/4	6.		0.7/2

Source: Nielsen

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[Gail Pennington](#)

The world is ending. How funny is that? Pretty darn funny, at least as depicted in **You, Me and the Apocalypse**, a British import making its U.S. debut Thursday on NBC. But this isn't a flat-out comedy. In classic British style, it's also weird and dark, with an uncomfortable premise and

production services at CBS Sports. "As you revolve around, you can actually see if the ball or the player broke that pane of glass. It's really cool and very dynamic."

CBS Sports has used similar setups since the 2001 Super Bowl in Tampa, Fla., says Aagaard, who holds a patent on the first EyeVision system, an SD-based multi-camera setup he describes as "a bit awkward and exceedingly big and expensive."

Several years ago, the network turned to Replay Technologies, in Tel Aviv, Israeli. The company has installed setups in Dallas and Baltimore that stitch together shots from multiple 2K cameras around the field to change the viewer's perspective from, for instance, behind and around the side of the quarterback to the view from a defensive back.

For Super Bowl 50, CBS Sports will capture those shots using 36 5K cameras built by JAI, a Japanese high-tech company specializing in imaging technology. Suspended from the upper deck of Levi's Stadium in Santa Clara, Calif., the cameras deliver 5K video to the Replay Technologies system.

There is a sweet spot on the field — in the red zone between the 25 yard line and the goal line — and some pretty specific game conditions that are required for the breaking-glass EyeVision 360 effect to work, he says.

"It's more effective in both red zones because of the way the cameras are laid out," he explains. "It also takes a couple of minutes to render." As a result, a situation such as one in which a play occurs, there is a challenge and the network goes to commercial break would be ideal. "We should be able out come out of that commercial with it."

Of course, EyeVision 360, which can be used without the breaking-glass effect, is only one of the many enhanced or new television technologies to be used by the 550 people CBS is sending to Santa Clara for game.

The network also will rely on a prototype high-speed Ultra HD camera from Sony that will be used on the opposite sideline camera cart that has proven itself in post-season play to be equally effective for viewers at home and game officials.

"There is only one of these 8-times, 4K Sony cameras on earth," Aagaard says. "It has the ability to zoom in so sharply and crisply, you don't even know we are doing it."

The camera was particularly useful during a post-season game in Denver when quarterback Peyton Manning fell down and there was a question about a defensive player touching him while he was down, Aagaard says.

"Even with all of the cameras there, we didn't see it well," he recalls. "But the operator of this Sony camera was able to zoom in and keep that resolution and show that the defensive player did not in fact touch Peyton Manning and allowed him to get back up and throw a very critical first down."

Aagaard, who counts this year's Super Bowl as his 20th, says that shot was particularly helpful to officials during a challenge the play.

More HD pylon cameras are also planned for the game, Aagaard says. Typically for a *Thursday Night Football* game, CBS relies on pylon cameras in each of the end zone pylons, but for Super Bowl 50, the network is adding two more at the back of each end zone.

"This will be the first Super Bowl with pylon cameras," he says, adding that ESPN has also used pylon cameras this season.

The small Marshall Electronics HD cameras that are part of the padded pylon assembly produce

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