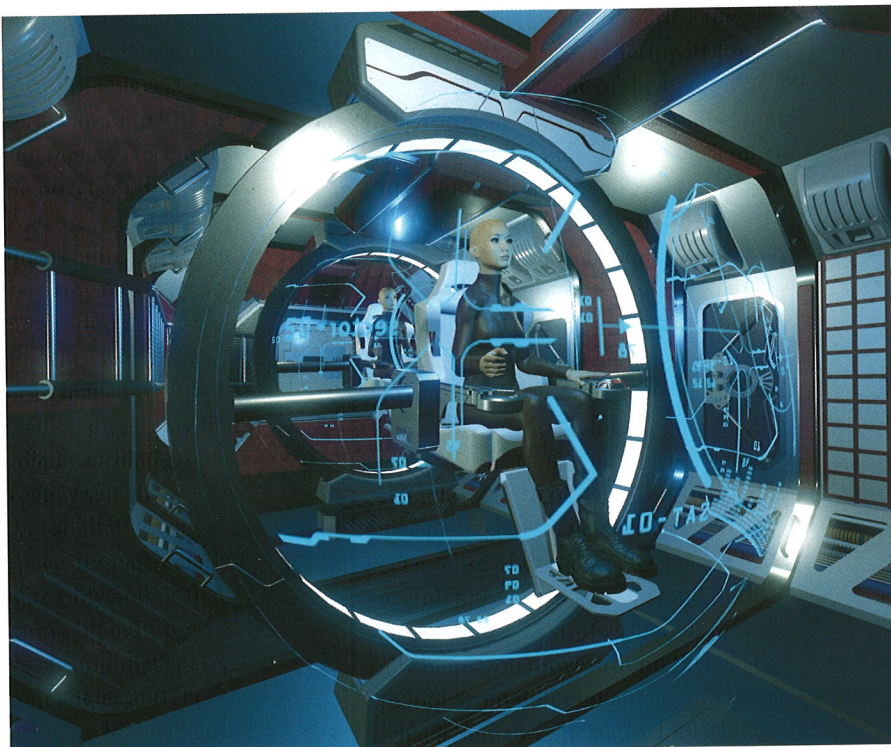


VIRTUAL SPACE: VR on *THE EXPANSE*

By Fanen Chiahemen

All screen grabs, Credit: Courtesy Alcon Entertainment



VR screen grab of the Razorback set from Season Three of *The Expanse*.

The science fiction series *The Expanse*, now entering its fourth season, is one of the biggest television series ever to shoot in Toronto (*Canadian Cinematographer*, December 2015). Based on the novels of the same name by James S. A. Corey, its futuristic, space-based storyline requires large sets with multiple levels, many of them shot 360 degrees. During production of Season Three, a virtual reality workflow was introduced in order to make previsualizing the sets more efficient, Jeremy Benning csc tells *Canadian Cinematographer*. “It allows us to preview sets that haven’t been built yet so that we can get a sense of the space. It’s particularly useful for sets that are fully 360 or that are two or three storeys high. It really helps you move around that space, to look from different angles and see what a human-scale figure looks like within that space, and also how you’re going to light it as far as where should lights go and where the action’s going to take place,” Benning, who has shot the show since the first season, says.

The VR process began with set designer Karl Crosby, who had been putting his sets into virtual reality to aid his design process since Season One of *The Expanse*, first assistant art director Christopher Danelon explains. By the third season, Crosby introduced the idea of using VR in the art department to production designer Anthony Ianni. Danelon then took over because the system required someone working with it full time. “He basically handed me the tools to do it and I ran with it,” Danelon says. “I took the core principle that Karl set up and progressed it further.”



Credit: Christopher Danelon

Using a combination of software engines that include the gaming software Unity (the core engine), the modelling software Maya, the 3D painting software Substance Painter, the 3D modelling computer program SketchUp, as well as a variety of other programs, Danelon built on the system, which allows the user to essentially “teleport” into a virtual set and explore it. “For us, mainly it’s useful for sets that are in very preliminary stages of construction,” Benning explains. “I’ll go in there and look around at the environment, and then basically see where maybe the dimensions aren’t quite right for the shot, or maybe a door’s in the wrong place, or some physical part of the layout would be better if it was changed. And you really are aware of it once you’re actually standing in there. You can really tell where things should be. Of course, it also allows me to give notes to the lighting team to start to figure out how we’re going to light it, which sometimes means I have to tell the art department we need to open up a ceiling in this area so I can put a light here. That happens every time I’ve gone in there.

And it tells my rigging team how they have to rig the lights inside the sets.”

The program allows the user to view the sets from any angle and at any height by lifting them up as though in an elevator, with the ability to pan left and right. “I was able to essentially program drone shots,” Danelon says. “So a director can say, ‘I am imagining this scene, and I want it to be done with the drone shot, can you lift me up?’ So I’d press a key, lift the director up and then be able to manipulate their movement from there, similar to what you would have on a drone.”

“It allows you to put yourself in places you couldn’t do in the actual set unless you had a ladder or a lift or something to get you up to the ceiling,” Benning adds. “It’s a good way to preview challenging camera positions that you physically can’t get to when you’re scouting.”

Danelon also developed a way to link the VR sets to members of the production in Los Angeles. “We built a computer and sent it over to L.A., so you can have two people on two different locations on the same set

Jeremy Benning csc explores a virtual set using the hand controller to snap images with the director’s finder.

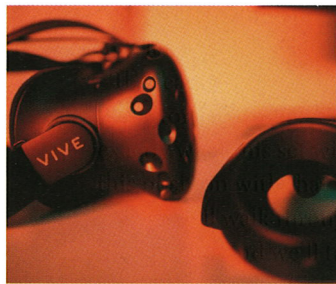
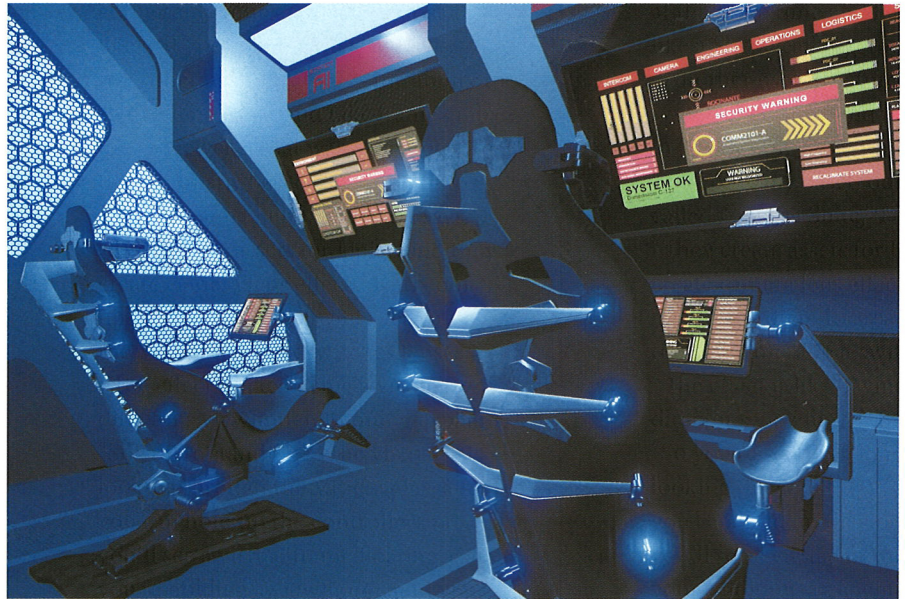
at the same time and have almost like a Skype call together,” he says.

Another useful feature is the ability to switch lens views and take frame grabs in the viewer. “That was developed by a company based out of Toronto called Cinema Suite,” Danelon says. “They create assets for Unity, and they create camera lens effects. Karl commissioned them to create a feature in the VR camera that switches lenses.”

The effect is like having a virtual director’s viewfinder, Benning explains. “So you’re standing in the virtual set looking through the VR goggles, and you can hold up the controller and you’ll see a virtual frame floating as if you’re holding a viewfinder, and you can see the set through a 14 mm or 18 mm lens or all the lenses that we have.”

The feature is particularly helpful with storyboarding. “So we know that’s exactly what this set will look like from this position with that lens,” Benning says. “We’ll walk through the set with the director and we’ll talk about how this scene is going to play out. Like if it’s an action scene or something that’s really technical with zero gravity or something, we can literally walk around the set and take pictures with the director’s finder, and those pictures can be exported as jpegs or as prints, and we’ll hand those to the storyboard artist and say, “These are all the angles of this set that we want to shoot this scene from.’ And then their job is to then draw the actors into those sets, and they’ve got the exact framing of where we can put the camera and how much of this set we’re going to see. All they have to do is add the people. So that’s super helpful because then your storyboards are extremely accurate. It’s really changed the way we all think about how we design sequences and how we light and how we build sets.

“Every department has used it to get a sense of what they have to deal with and what the specific challenges there are going to be with that set,” he says. “It means that everyone is able to work faster, and when we show up on the day, the set is much closer to what we need it to be than if we hadn’t had that ability to see it in advance.” 🍷



Clockwise from top: VR screen grab of the Rocinante Ops Deck set from Season Three of *The Expanse*. Christopher Danelon using the hand controllers to navigate a VR set. Christopher Danelon runs the VR system. VIVE VR headset and hand controller.

Credit: Courtesy-Alcon Entertainment

Credit: above and left: Jeremy Benning CSC