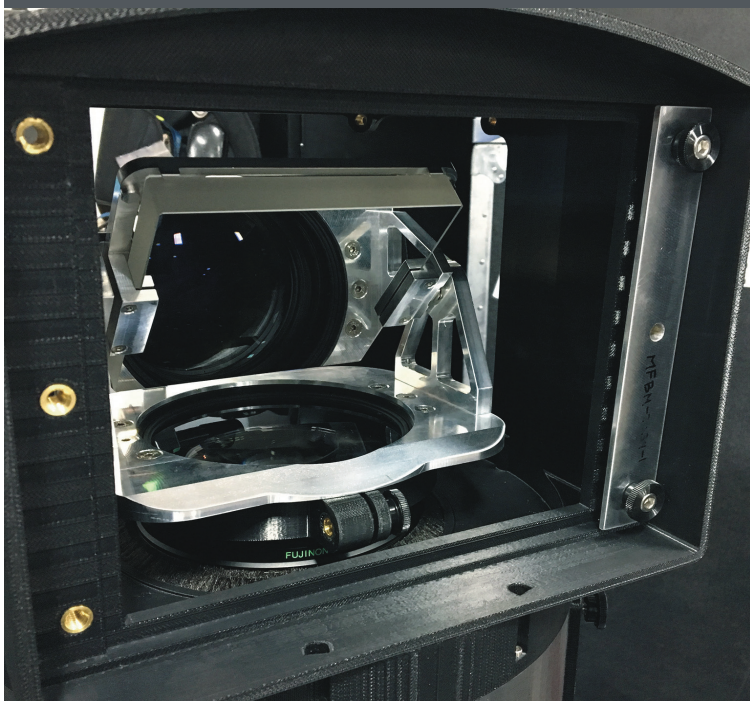
VER Brings it Home

Ballpark Upgrades Signal A Step Backward In Home Viewing

If a picture is worth a thousand words, then a final inning close- up of the blood, sweat and tears on a Major League pitcher's face is priceless. "These shots are telling the story of the pitcher," says Patrick Campbell, director of global camera operations at VER, in Glendale, California. "It's the drama of the game. And in later innings it's the picture of whatever's going through the pitcher's mind." This key camera angle is possible only with a low camera positioned directly behind home plate. But it's precisely this prime real estate that's been lost in widespread ballpark renovations in recent years. With additional seats installed in this coveted position, a few season ticket holders have an exclusive corner on the view once shared with the home viewer.

> "None of this would have been feasible without 3D printing. We printed whatever parts we could because we didn't want to send it to manufacturing and lose control over the timing and the quality. There's a real benefit to having a part in your hand and evaluating it with very little effort or manpower."
>
> Patrick Campbell
> VER



stratasys

VER Brings it Home

Recovering this camera angle for viewers was a challenge taken on by stakeholders at VER, a video equipment rental house offering equipment and crew and design services for live broadcast sports, concert tours, TV and the entertainment industry. “We have a long-standing relationship with ESPN,” said Campbell, “and they’re always looking for ways to improve what they do.” ESPN approached VER with interest in regaining the camera position. The first step was to get approval from the MLB. VER designed and built a scale mockup using 3D printed parts and cardboard tubing to show the MLB the concept. Once they saw the scale of it, they were receptive to the idea and VER went to work on an actual working unit.

Iteration of camera “number two” for use in MLB ballparks.

The Solution for Baseball and Beyond

Ultimately, VER came up with two cameras in an effort to best capture the drama of the game. “The first camera we built was based on a wider angle version of the lens,” said Campbell, “and we refer to it as ‘number one.’” VER took this first camera to Arizona for a spring training game, and then to another and finally tried it out at a first regular season game. “What we learned,” said Campbell, “is that it needed to be a lot shorter, the mirror needed to be a lot smaller and the lens needed to be tighter.” The company then built “number two,” a smaller version with a tighter lens that enables a tighter shot of the pitcher’s face.

VER’s challenge was figuring out an environment-proof housing that also met MLB’s stipulations for an on-field camera. VER had a Stratasys Fortus 900mcTM 3D printer on site that they’d used for other projects and they quickly realized the strong, lightweight properties of FDM 3D printing might be their answer. The ballpark environment posed additional hurdles such as the force of the water hoses used to spray down the field before a game. “Being able to 3D print the camera housing was really great because we knew it would hold up to the rain, dust and exposure,” said Campbell.

One of Campbell’s first considerations at the onset of a project is whether or not cases or housings can be 3D printed. “A lot of times it’s a one-off or 15-20 of something and the volumes really aren’t there to tool up in a typical manufacturing environment.” VER had built five design iterations along the way in this project and “I couldn’t even guess what the costs would have been to actually manufacture it out of metal,” said Campbell. “None of this would have been feasible without 3D printing. We printed whatever parts we could because we didn’t want to send it to manufacturing and lose control over the timing. There’s a real benefit to having a part in your hand and evaluating it with very little effort or manpower.” Furthermore, said Campbell, “3D printing is truly lights-out manufacturing. Being able to set up a print, then go home for the night and come back to a finished part is definitely very valuable.”

VER's camera and lens setup for the "The Amazing Race" with 3D printed lens support.

VER Brings it Home

An unintended benefit of VER's fully functional "camera one" and "camera two" was that once they'd solved MLB's camera position "we had one wide-angle version and one telephoto version. Once we settled on the telephoto version for MLB, the wider angle version was available."

This proved expeditious as ESPN's production of the U.S. Open, held in Flushing, New York, was interested in a technology demonstration of the wide-angle system to help them get slow motion shots. "In tennis, they pretty much want a camera on the court but since they're much smaller and you already have a line judge and a ball boy, having camera people on the court is less desirable." So, with "camera one" available, VER began testing their tennis camera at a tournament at Stanford University, iterated further, and then got the USTA to approve its use at the US Open.

At the time VER had no idea their camera evolution from MLB to world class tennis would next lead them to "The Amazing Race, Season 30," the reality TV game show. The show decided to go with new cameras and the camera crew needed to customize some accessories. Specifically, they needed something they could wrap around their lenses for protection and support. Campbell again turned to 3D printing and with inspiration striking one evening, he printed the first two iterations of this protective piece on his home Makerbot 3D printer, reprinting the final version on VER's Fortus 900mc for all 15 cameras. "Over the course of three days we had three iterations of a bracket and 'The Amazing Race' loved it," because it was both lightweight and strong. At one point the cameraman dropped the camera and it hit the ground and because of that bracket the camera and lens survived without damage," said Campbell.

From on-field MLB cameras to US Open court-side cameras to reality television camera brackets, 3D printing allows for rapid iteration and design validation, high strength-to-weight ratio, as well as printing environmentally sound parts. "Pretty much the perfect tool," said Campbell.

Stratasys Headquarters

7665 Commerce Way,
Eden Prairie, MN 55344
+1 800 801 6491 (US Toll Free)
+1 952 937-3000 (Intl)
+1 952 937-0070 (Fax)

stratasys.com
ISO 9001:2008 Certified

1 Holtzman St., Science Park,
PO Box 2496
Rehovot 76124, Israel
+972 74 745 4000
+972 74 745 5000 (Fax)