Local Hero Post pushes the outer limits of VR Finishing with Silverdraft Demon

While Local Hero Post has built an enviable reputation for its 2K/4K DI grading prowess in prestige independent films, the bustling business also recently set a new benchmark in Virtual Reality (VR) finishing.

The Santa Monica-based boutique was tasked with delivering a polished result on director Doug Liman's heart-pounding, six-episode action series Invisible, one of the most ambitious narrative VR productions ever made, which has since gone on to receive rave reviews. The series was created in partnership with Condé Nast Entertainment (CNÉ), Jaunt VR, Samsung and Liman's production house 30 Ninjas.

Specifically envisioned and written as a 360° VR series, Invisible required Local Hero Post to blaze a brand new trail in VR post, using Silverdraft Demon VR supercomputing technology to achieve unprecedented realtime 4K 60P 3D VR performance, and enable all manner of deft, finessing touches in pursuit of a spectacular result.

IN THIS SPECIAL Q & A:

Leandro Marini, company co-founder and senior colorist, reveals Local Hero's journey with Silverdraft's Demon technology, and how it has helped the company become a powerhouse DI provider, while pushing outer limits of VR.

Tell us about Local Hero Post's approach to the DI market?

Marini: At any given point we have multiple productions running simultaneously in our DI pipeline. Remaining at the forefront of the fiercely competitive DI market, as well as being ready for new trends such as VR, means maximizing the potential of the very latest technologies. So we work to keep things as efficient and as competitively priced as possible for our clients, while making sure our creative artists have the resources they need to deliver studio quality projects.

What was the challenge with your previous installation?

Marini: We were running our hero DI theater on an ageing HP Z820 workstation, but with the exponential growth of our business, combined with the expectations of our colorists and clients for faster throughput, plus things like VR on the horizon, we were seriously in the market for a much more powerful workhorse system.

When did you first discover Silverdraft Demon supercomputing?

Marini: We noted Silverdraft at NAB 2014, as they were starting to migrate their mobile super-computing system into the first Devil and Demon machine room/desk-side workstations. We got a Demon in for side-by-side 4K comparison tests and were incredibly impressed by its compute power, using just a single GPU, and its ability to out-perform our old multi-GPU systems.

That Demon became the heart of our hero DI grading suite for theatrical releases ¬– running Assimilate's SCRATCH and Black Magic's DaVinci Resolve grading systems – supporting client-attend 2K and 4K DI sessions. Over time it proved to be stable as well as mighty-fast, and we've completed the DIs on many features, such as Matt Ross' Captain Fantastic (2016), Rob Reiner's biopic of US President Lyndon Johnson, entitled LBJ, Jack Black's wacky comedy The Polka King, and Hallie Meyers-Shyer's Home Again, plus a host of narrative dramas for OTT entertainment companies such as Netflix.

What were Local Hero Post's early VR experiences?

Marini: We started to attract live-action VR projects in 2015, working with Jaunt on a number of short VR productions for NFL, BMW and Conan O'Brien – typically using Mac Pro or HP Z820's to get the jobs done. We quickly learned that VR DI post is quite a different proposition to 2D DI.

What challenges does VR present for post production?

Marini: While VR has huge potential in many areas, the workflow is in its infancy. It's a Wild West. The continual evolution of VR camera arrays, shooting formats, VR headsets and multi-platform deliverables mean there are no standards. There is no standard color space. No standard headset to accomplish the job in post. We quickly realized that each VR production comes with its own particular set of needs, and that you have to be both agile and prepared for the unpredictable.

What were your specific challenges with regards to Invisible?

Marini: Invisible was the biggest-budget narrative VR production to date, from a leading filmmaker and with great expectations. So the stakes were high from the start.
The series was shot at 4K/60P using Jaunt's VR 360° camera array. On the logistical level in post, pushing 4K 60P stereo – to both eyes – represented twelve times the data-processing as compared to working in realtime 2D HD, and that's intense.

On the aesthetic level, Invisible is a dark and moody production, and Doug wanted to make a dramatic family thriller within this context. A lot of the action takes place in dark hallways, within shadows and people in silhouette, and we knew we would have to learn the VR narrative language.

On the creative level, along with color grading, there were a range of stereo fixes, composites and VFX work to complete – all in 3D virtual reality. Plus, we had to make the result look great across multiple platforms. All we knew at the outset, was that about a third of people would probably see Invisible on a Samsung Gear VR headset, another third would see it on a platform like YouTube 360, and the final third would see it on some other headset like Oculus Rift, HTC Vive or Google's new Daydream.

What was your technical set-up for Invisible?

Marini: We started-out by running the project on a Mac Pro, but could not get near realtime 4K/60P/360° performance, and we clearly needed something stronger. As we already had a successful experience with the Demon in our theatrical grading bay, we looked to our friends at Silverdraft for a solution. They presented us with a specially-configured Demon VR box – an industrial-strength workstation, optimized for product design visualization and high-frame rate playback. It just flew from the get-go, giving us the realtime 4K/60P/360° performance we needed. That's unprecedented.

We worked out of our broadcast DI bay, where we finish productions destined for every screen but the cinema. For Invisible, we ran ASSIMILATE's SCRATCH VR Suite on the DemonVR using specialized storage, and had dual, simultaneous realtime outputs: one to an Oculus Rift VR headset, worn by our lead colorist Lee Hultman, the other to a Dolby PRM-4220 professional reference monitor for the clients. While it looked pretty weird and futuristic by outward appearance, working this way was a pretty magic experience. This set-up enabled Lee to view and grade a scene in full 4K 360°, while the clients saw the results of the headset view on the monitor.

As far as I am aware, this remains a pretty unique set-up. We were blown away by the performance of the DemonVR, and the level of creative control we had to adjust and manipulate the images in realtime.

What sort of image manipulations did you do during the VR DI to perfect the visuals on Invisible?

Marini: We are a very experienced SCRATCH shop, having used it for ten years. SCRATCH VR has insanely flexible compositing and image manipulation capabilities designed specifically for cinematic VR. SCRATCH VR Suite and DemonVR made for a great combination on Invisible.

During the DI we used SCRATCH's cloning tools to perform fast clean-ups of artifacts that were present in the Left & Right eye stereo extraction (typically on the edges of the characters, sets and props), and to perfect any troublesome stitches. We also subtly treated the depth-of-view by dimensonalizing certain 2D shots – drawing a roto mask around a face to create a 3D field, through which we could pull a nose forward, push eyes back, push the sky back, all in a matter of seconds. That is next-level stuff for VR post.

The positioning of subtitles and text are a really big challenge in VR. To avoid any eye strain, have to be careful about where these are positioned with regards to the live action. Due to the DemonVR and SCRATCH set-up this was fast and interactive.

Perhaps one of the biggest aspects of achieving a great result in VR is in the reduction of image noise. While small VR arrays are convenient on-set, they necessarily use small sensors, which have lower dynamic range and higher noise thresholds compared to bigger rigs. Lighting 360° scenes can be especially tricky since it's tough to hide the lights. Hence, VR production relies much more on natural light, than regular live action. Even with the best intentions, VR images can look grainy and that's a major problem for an enjoyable, immersive experience. So we hit trouble shots with heavy de-noise, which proved just the ticket. All of a sudden the image was more accessible- like looking through a clean window- and this enhanced the dramatic effect and overall quality of the final look.

How did you manage the color of the final deliverables on Invisible?

Marini: This was tricky, as there are no color standards in VR. Although we worked with the Oculus Rift headset during the VR DI, we were aware of the different platforms the project would eventually be viewed on. So for color fidelity QC purposes, we regularly swapped-out headsets, and checked playback on different tablet an smart phone displays. This helped us find a common ground that would look good across the different display devices.

What are your thoughts on the outcome of Invisible?

Marini: As a first foray into scripted VR storytelling, Invisible is an immersive and impressive experience, no question. It is groundbreaking because it works as a piece of entertainment. Doug Liman's vision and success will no doubt encourage and inspire other storytellers to explore this new visual language.

From a post-production standpoint, Invisible proved a considerable challenge. Like the other VR work that Local Hero Post has completed before, Invisible represented another great learning experience in these early days of immersive VR content. Unfortunately, the ever-changing camera arrays, sets of players and headsets, mean there is no standardized VR DI workflow. So it was definitely a case of having all hands on deck and every day.

It remains to be seen if audiences will clamor for VR narrative content. But if and when they do, the flawless, powerhouse performance of DemonVR demonstrated you can rise to the challenge of even the most extreme requirements.