

Ultimatte Stars in *Ghosts of the Abyss*

James Cameron, the Oscar-winning director of *Titanic* and *The Abyss* has once again returned to the deep to produce the first digitally photographed stereoscopic 3D IMAX film, *Ghosts of the Abyss*. The 3D images and giant IMAX format of *Ghosts of the Abyss* provide a powerfully immersive “you are there” experience that makes audiences feel as if they’re in deep-diving submersibles, seeing the silent, slowly decaying hulk of the *RMS Titanic* up close, two-and-one-half miles beneath the North Atlantic. The ship sank after striking an iceberg on the night of April 14, 1912, claiming more than 1,500 lives.

Cameron’s film is an unscripted, awe-inspiring, and sobering documentary of one of history’s worst maritime tragedies. An innovative project in multiple respects, *Ghosts of the Abyss* also pays homage to *Titanic*’s victims through the skillful use of all-digital Ultimatte HD compositing technology.

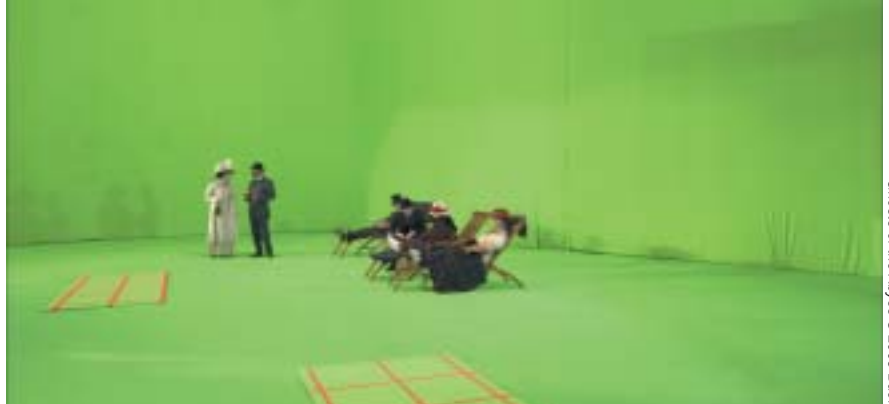
3D Reality

Principal photography on *Ghosts of the Abyss* occurred during the Fall of 2001 on board the Russian research vessel *Keldysh* and its twin deep-diving *Mir* submersibles. Veteran underwater filmmaker and cinematographer Vince Pace shot the film using the Reality Camera System, a 22-lb. custom rig outfitted with twin digital Sony HD-950 cameras and Fujinon HA 10x5B-10 HD Cine Style zoom lenses separated at a distance equal to the average space between the right and left eye. The Reality Camera System was co-designed by Cameron and Pace, with Pace Technologies playing a major role in developing the Reality Camera System’s underwater housing. The system was mounted outside a *Mir* and able to withstand the crushing pressures on the floor of the North Atlantic, 12,500 feet down. The system gave Cameron a wide freedom of camera movement, including the ability to change the lens’ convergence on the fly. Cameron’s crew included *Titanic* star Bill Paxton, through whom audiences experience the dive.

In addition, each of the two *Mir* submersibles carried a small, self-contained ROV (remote operated vehicle) designed by Mike Cameron, the director’s brother. The ROVs, named *Jake* and *Elwood*, carried their own light sources, SD video cameras, power, and more than 2,000 ft. of fiber optic cable to send video images back to recorders on the two *Mirs*. The ROVs were able to enter openings in the *Titanic* and reveal interiors not seen by human eyes since that tragic “Night to Remember” more than a century ago.

HD Compositing

Addressing the human tragedy of the *Titanic* is where the film’s *ghosts* come into the picture—literally. Cameron accomplished this task with multiple shots in which he superimposed—while maintaining proper 3D stereo



Original underwater shot of *Titanic*’s deck (left), green-screen shot of actors (top), final “ghostly” composite (right). *Ghosts of the Abyss* is now showing in Imax Theaters and Large Format Cinemas.

space—3D imagery of actors in period costume on his underwater 3D background plates of the wreck. Working at the Rosarito Studios, in Baja California, Mexico, where he produced his Oscar-winning *Titanic* movie, Cameron shot as many green-screen and insert elements as possible from which to create his effects while *Ghosts of the Abyss* was still an unstructured documentary.

“The ability to preview the marriage of these foreground green-screen elements with the underwater *Titanic* photography was a big challenge,” says Visual Effects Supervisor Chuck Comisky. “We were faced with an unknown volume of visual effects and historic re-creations and we had a five-day shooting schedule.”

Once they were on the stage at Rosarito, Art Director Martin Laing built a number of green-screen sets and assembled historically accurate period props and set pieces, including lifeboats and launching davits.

In his career as a visual effects supervisor, Comisky had many positive experiences using Ultimatte for visual effects previewing. But, as a 3D large-format project, *Ghosts of the Abyss* was different.

“This project needed the ability to preview stereo composites in high definition, 1920 by 1080,” Comisky notes.

By the time *Ghosts of the Abyss* was ready to shoot their first green-screen composite, Ultimatte had already begun shipping its real-time HD

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Ghosts of the Abyss © 2003 Buena Vista Distribution and Walden Media, LLC.

matte-compositing system for all digital HD and digital cinema 24p/psf image standards. Part of the third generation of Ultimatte's all-digital compositing devices, the Ultimatte HD had been proven for complete compatibility with Panavision and other digital HD cameras.

Staying in Perspective

On the suggestion of Ultimatte President Lynne Sauve, Comisky contacted Ultimatte Operator David Satin, of SMA, in New York, to operate the Ultimatte HD on the set in Mexico. With an extensive background in stereo photography and filmmaking as well as 20 years in chroma-keying and blue/green screen compositing, Satin was used to jumping into tough situations and creating solutions on the spot.

Not only would Satin have to use the very first production model Ultimatte HD to marry the "ghostly" actors with background plates of the *Titanic*, but he would have to marry the two "eyes" of the 3D image. It would be a first; no one had ever created—much less used—a high resolution 3D previsualization system. But, without

it, the filmmakers could never be certain that they had "nailed" the 3D image as the camera moved.

"The 3D Reality Camera System that Cameron and cinematographer Vince Pace developed allows you to focus and zoom in stereo, which is amazing," says Satin. "That hasn't been done before. We wanted to make sure that the image of the 3D perspective stayed on the screen at all times."

Working together, Satin and the production's editor/tech guru Ed Marsh tailored a stereo (left eye/right eye) composite previsualization system.

"The Ultimatte is the Swiss Army knife of visual effects production tools," declares Satin. "There is a huge set of features related to blue-screen photography, but you can easily make it do things that you wouldn't ordinarily expect it to do. At random times we used the Ultimatte HD as a green-screen matting device, an HD split-screen generator, an HD dissolve unit, and an HD color corrector as needed."

To enable ideal previsualization of the 3D images, Satin created a preset for the left eye and right eye so that—at the push of a button—he could go back and forth, showing the filmmakers the view of each eye individually. He also created an overlay preset, which enabled the director and the camera people to see the im-

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VICTORY TAPS WACKER

The Victory Studios (formerly APS, American Production Services), a leading HD production and post leader facility in Seattle and North Hollywood CA, has named Mike Wacker as VP of Business Development & Special Projects.

"Mike Wacker's acquired business expertise, creative talents, and commitment to excellence and team building will have valuable application at Victory Studios," states company president, Mark MacDonald. Wacker joins Victory after 17 years with the NFL/Seattle Seahawks as Director of Broadcasting.

Find additional information at www.victorystudios.com.

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ages from the two HD cameras overlaid. This sped up the alignment of the 3D camera system dramatically, and increased the number of set-ups that could be shot per day.

Satin also points out that previsualization was especially important since the circumstances of the underwater production meant that it was impossible to take measurements of the distance of the camera from objects. These measurements, typical in visual effects cinematography, enable the cinematographer to re-create the shooting parameters for green screen shoots and, later, compositing.

"I was able to change parameters to make the image look and fit together the way Jim wanted it to look," says Satin. "We were able to take the photography of the people in the foreground plate, and make them look ghostly. I could do that in real-time, interactively, and make changes to suit Jim's taste. Then, I could record those settings and recall them as needed."

And how did the Ultimatte HD work on set? "Better than expected—and I expected a lot!" Comisky enthuses. "Since we had cloned left and right eyes of Jim's pre-selected underwater plates, we could preview composites on the spot for Cameron and Pace. We were also able to check our green-screen lighting for possible compositing difficulties and make any needed lighting corrections." For example, Satin was able to move a set-up involving a lot of shiny brass props farther away from the green room's corner to minimize green spill from the brass. Another time, shooting the sequence of the lifeboat falling on deck, he halted the shoot of that scene until the floor's green paint got a touch-up.

A dramatic speed-up in production was the happy result of utilizing the Ultimatte HD set-up for stereo high-resolution previsualization.

"This enabled us to shoot many, many more

set-ups per day," says Satin, who estimates that the number of set-ups topped 30 a day.

When it came time for post production, the real benefits of the Ultimatte HD previsualization came to the fore. At Technicolor Creative Services Hollywood, compositor Adam Howard was able to line up the foreground green-screen elements (the "ghosts") with the underwater *Titanic* wreck photography and then "fit" the ghosts in stereo space, tracking them to the camera movement of

the underwater photography.

Comisky points out that he never would have been otherwise able to give Cameron so many visual effects choices in post production, especially given the very limited time allotted for visual effects photography.

Ghosts of the Abyss was financed by Walden Media (a sister company to exhibition giant Regal Cinemas) and is distributed domestically by Disney. ■

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LOCATION SOUND UPDATES WEBSITE

Location Sound Corp. (LSC) has redesigned its website, www.locationsound.com.

"With more and more people relying on the web for information, we made a conscious effort to redesign our site from our customers' point of view," explains Angelica Bayona, LSC's Marketing Director.

The new site delivers other customer-focused improvements such as ease of navigation, a search function, and a request-for-quote function. Headquartered in North Hollywood CA, LSC is an employee-owned corporation serving the audio needs of the motion-picture production community for more than 25 years.

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Ultimatte USA

20945 Plummer Street • Chatsworth, California 91311
tel +1.818.993.8007 • fax +1.818.993.3762

Ultimatte Europe

Zijdenstraat 72 • 1431 EE Aalmeer • The Netherlands
tel +31.297.380.935 • fax +31.297.380.939

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