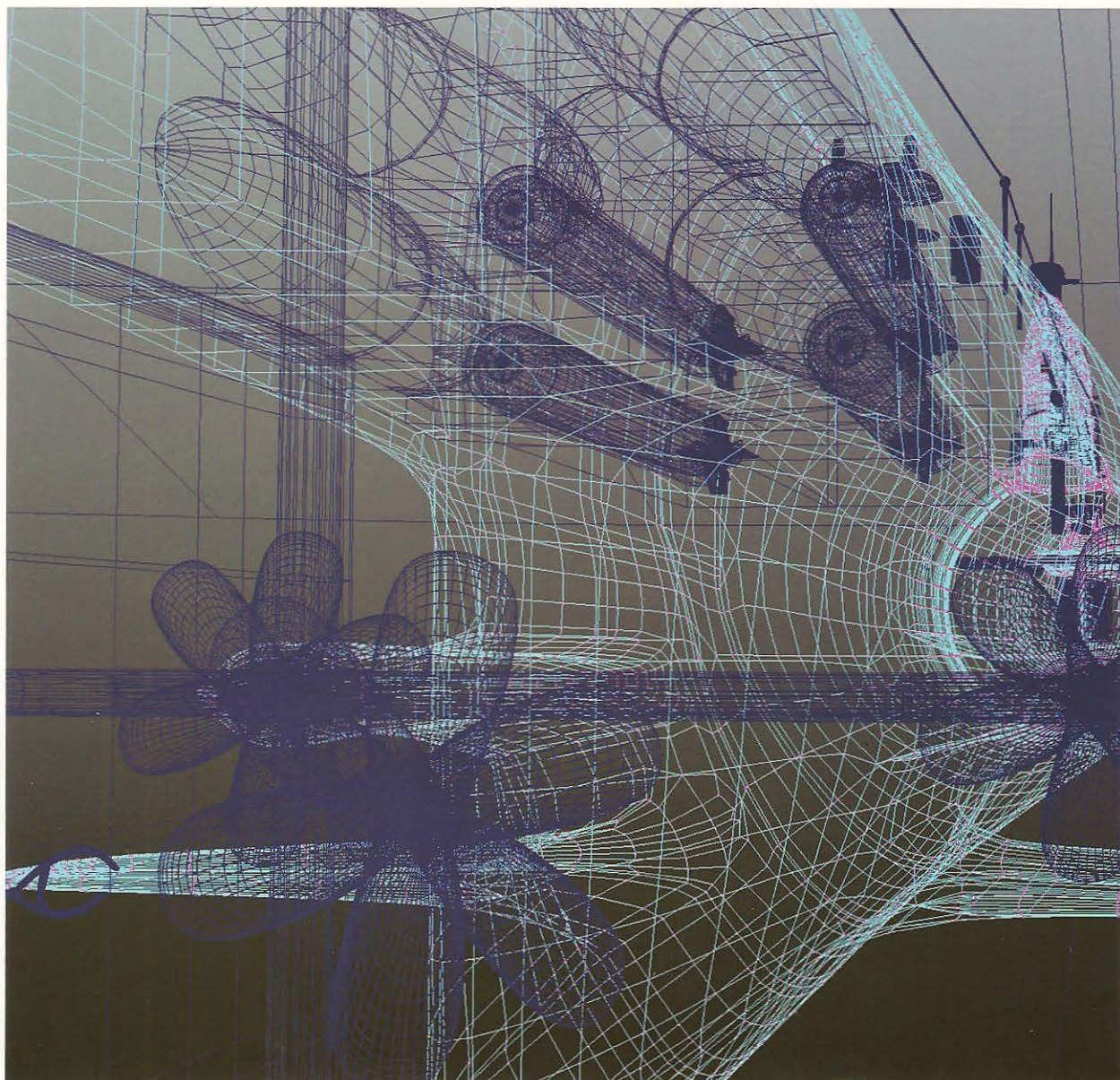
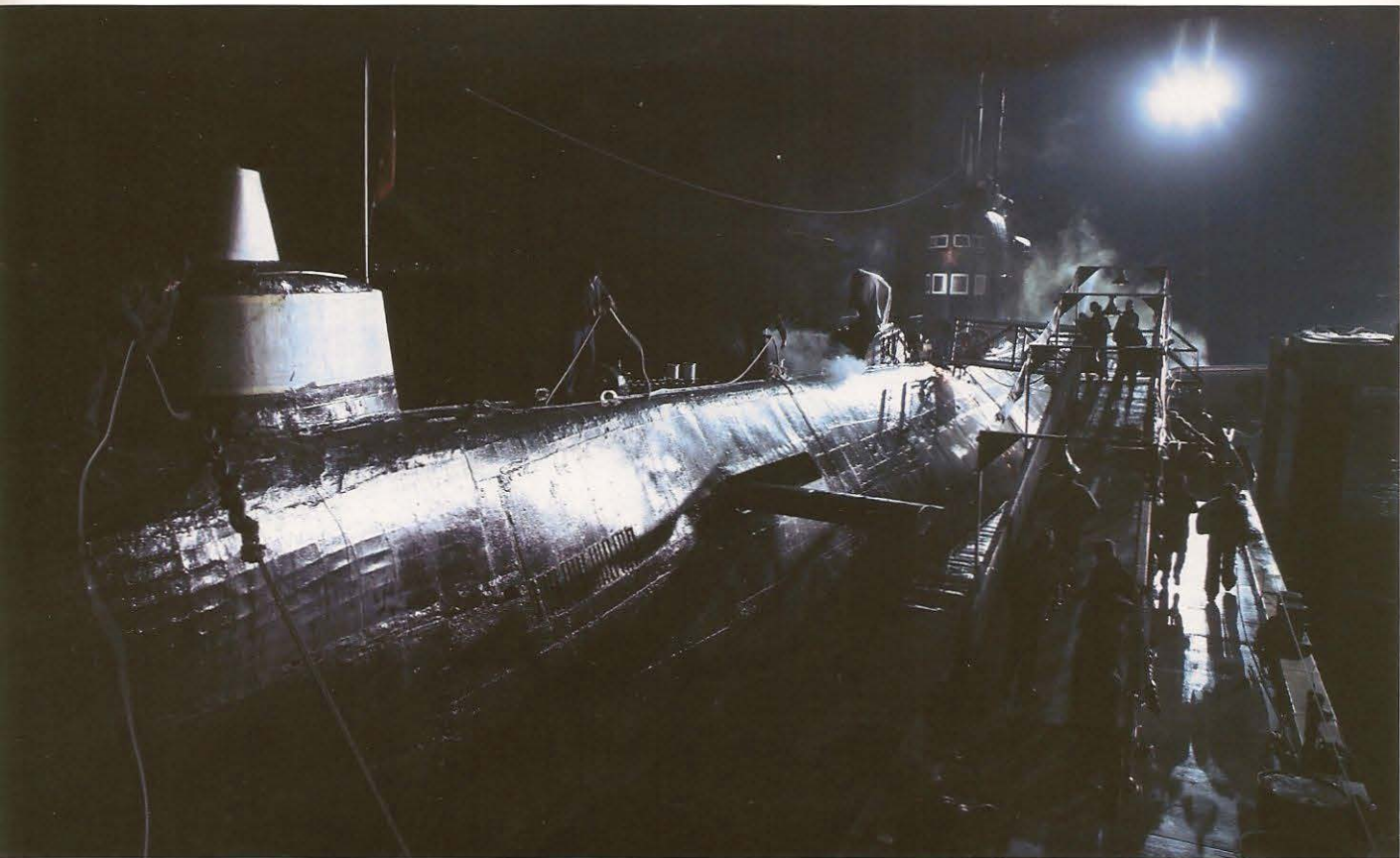


SILENT RUNNING

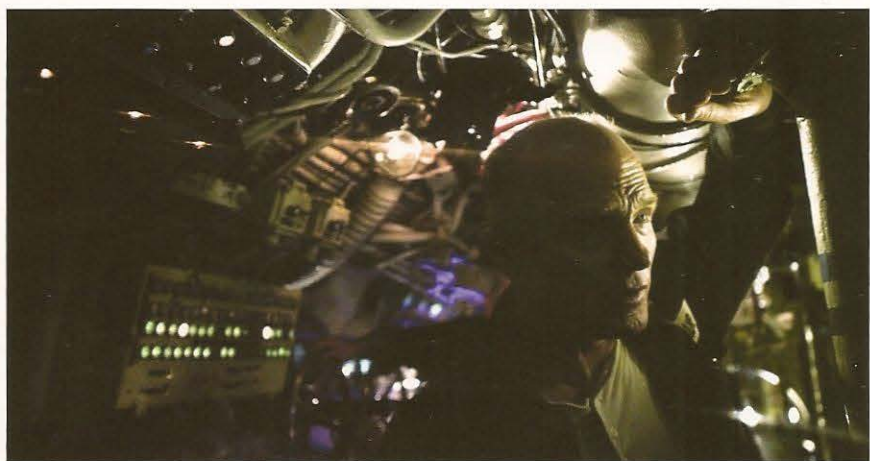
BYRON WERNER AND HIS ALL-GUILD TEAM BREAK THE SURFACE OF POSSIBILITIES FOR THIS VFX-HEAVY INDIE THRILLER SHOT ONBOARD A SUBMARINE!

by **PAULINE ROGERS** *photos courtesy of RCR*





The Russian submarine Foxtrot, harbored at San Diego's Maritime Museum, which cinematographer Byron Werner describes as "the real star of this movie."



Bottom Left: Werner measuring throw from a Lite Panel unit onboard the sub • Middle Right: Tessa Robinson (left) and Dagmara Dominczyk (right)
Bottom Right: Ed Harris as the sub's AWOL captain "Demi"

Emmy-award-winning writer/director/producer Todd Robinson (*White Squall*, *Lonely Hearts*) has always had a love affair with submarines and, consequently, movies like *Crimson Tide* and *Das Boot*, which he calls “bottle” shows – dramas in tight places that jack up the emotion and tension.

Phantom, the story of a haunted Cold-War Soviet missile captain (Ed Harris) being challenged by a rogue KGB group (led by David Duchovny) bent on seizing control of the ship’s nuclear missile, was developed by Robinson over nearly two years in such high-tech locations as his own garage, where the filmmaker built a CGI model of the envisioned sub and environment.

“I would clarify in previs mode, working for months building the CG model of the sub,” Robinson recounts with a smile. “This was very difficult because it was not just a tube but a rusting relic with compound curves. It took thousands of polygons.”



Early "skinned rendering" of CGI submarine model courtesy of Stargate Studios

As he got to the final stages, Robinson brought in cinematographer Byron Werner. The two had worked together on a music video – and clicked. Robinson knew Werner could get a "big picture" look. "Todd and I knew there was no replacement for having our actors a few feet if not inches apart, delivering dialogue," Werner describes. "So, we wanted to shoot as much as possible on an actual Russian submarine, which we found in San Diego at the Maritime Museum.

"As we began breaking down the shots that would take place inside the Con [short for *Control*]," the DP adds, "we had to know what was going on outside the sub, and how we would tell the story of the second part of the movie, which happens in the CGI world."

Robinson ordered up model subs, and the pair used a box with propellers on the bottom to act as a tanker. They used a still camera and shot storyboards for each sequence. "It was like kids playing with models on a stick," Werner laughs. "We worked out the shots using forced perspective and various camera angles." Camera PA Mike Perez then took the stills into Google Sketchup and finessed them.

"This is where Stargate entered the picture," says producer Pen Densham. "I've worked with Sam Nicholson [ASC; CEO and founder of Stargate Studios] on many projects, and his team's inventive solutions give clients top-feature quality at a lower cost than many of the major effects houses. His people created realistic effects and were really able to tie live action, CGI and

aerial into seamless excitement."

Werner says they shot the interiors of the Con before anything else. "One of the most brilliant moves," he describes, "suggested by producer John Watson, was to allow us a day after we finished pre-lighting the con and before principal photography to use stand-ins to test all the camera and actor positions. This was a lifesaver. Everyone knew what hardware we needed to mount for all the various scenarios. We used a bungee rig, a Modern three-foot camera slider on a Bazooka, and a Dana dolly with many lengths of pre-cut speedrail. As much as I would have loved a Steadicam, there was no way one would fit."

Werner insists *Phantom* would not have worked without a RED Epic. "We shot with various wide prime lenses or the Optimo 16-42-millimeter and 30-80-millimeter zooms outfitted with a small matte box, the small OConnor HD head, a Preston FIZ and Cam-Wave Wireless HD monitoring system," he recounts. "First AC Shane English was almost never next to the camera. He pulled focus from another room via an OLED monitor."

The camera team, which included English, A-camera operator Jack Garrett, A-camera 2nd AC Britta Richardson, Technojib operator Devin Atwood, DIT Isidro "Cid" Pineda, B-camera 1st AC Andy Kuepper, B-camera 2nd AC Noah Henry, and 2nd Unit DP Mark Kohl, who shot other sequences on the



Sunset falls on Foxtrot in San Diego's Coronado Bay

sub parallel to Werner's A-team, pulled out all the stops inside the real sub, moving shots as much as possible, sometimes with only millimeters to spare, just missing pipes or dials.

"One of my favorite rigs, suggested by key grip Jake Cross, was a Mitchell-based head that had a slot for a ball [Shot Ball Cam Rig]," recalls Werner. "You could pick different balls in order to get different firmness or softness. We would often balance the camera on a slightly deflated volleyball so that we could roll the camera while it moved on the slider, creating a feeling that we were actually deep in the ocean."

Lighting inside the sub presented some interesting challenges. Since the hull was airtight, they were completely sealed off from access to power distribution. Chief Lighting Designer Steven A. Lundgren realized that versatility was more important than juice, so he opted for [18x] 6x channel Tree Dimmers (Leprecon ULD-36) throughout the boat, powered by three separate waterfalls, all controlled by a laptop-based Horizon dimmer system placed in a closet-sized room.

"To best achieve the edgy look Todd and Byron had in mind, we ended up using a lot of small tungsten units," Lundgren explains. "We must have hidden 50x or so Medium Base rigs with 100-watt JDRs just in the ceiling in the Con, mainly to highlight instrumentation and to function as edge lights. We also built what we called 'can lights' – paint cans that had 50-watt MR16s inside. We attached rare earth magnets to the back of the cans, allowing them to be moved around freely, especially in the narrow hallways.

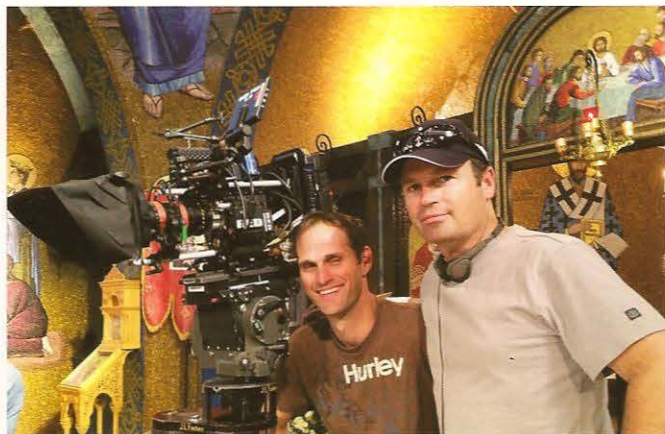
"The other challenge was lighting the talent in a six-by-six-foot space," Lundgren adds. "To be able to light each actor separately, we designed dimmable LED strips in various lengths. The advantage was that we could put them anywhere. We also had 12x Litepanel LED bricks that we were able to rig wherever we needed to by using rare earth magnets that we attached to ¼-inch Baby pins.

With interiors shot, it was left up to Stargate VFX Supervisor Mark Spatny to meet the challenge of making an independent film look like *Crimson Tide*. It was made easier by the fact that Stargate already had a pipeline optimized for turning around high-quality effects on episodic TV schedules.

"We knew that the success of the effects depended on using a blend of practical and digital submarines," Spatny relates. "For example, the budget and schedule could not accommodate the very complex fluid simulations required to see the submarine breaking the surface of the ocean. For that, we used a 1/15th functional miniature, hand-built by submariner and historian Kenneth Sewell."

Sea trials took place in the tank at the Academy-Award-winning Fantasy II Studios in Sun Valley, where Spatny says real elements, for things like explosions and bubbles, were also shot, "because they would look better and be more economical," he notes. "For all underwater scenes, however, our ships would be entirely CG in a digital ocean."

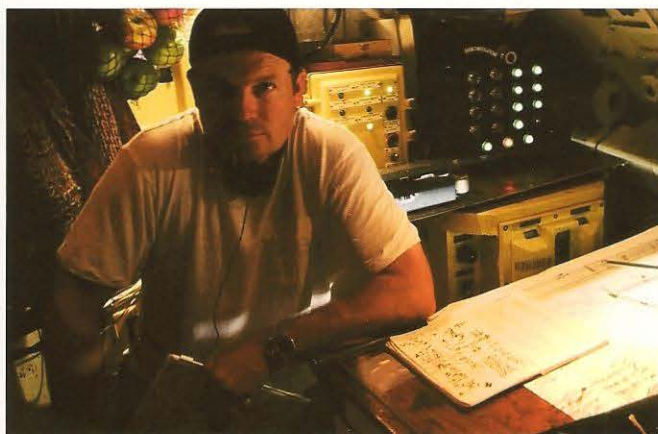
Stargate took Robinson's storyboards and converted them



Byron Werner (L) and director Todd Robinson (R) on set



Sound mixer Ken King in his "phone booth" on the sub

Werner says *Phantom* could not have been shot without compact 5K RED Epic

Robinson navigating from "the con"

to animated previs that would later drive final animation. After viewing classic submarine movies, the team realized most were limited to quick cuts strung together.

"Since our combat shots were entirely CG, we decided to try something different," Spatny continues, "by giving the audience a chance to see longer shots with wider angles, showing more clearly the relative positions of the submarines and torpedoes in 3D space. We knew we would be cheating the look of the water somewhat, making it more clear, but it would give the audience more visibility."

The model Robinson created for the hero Foxtrot ship was used as a reference by Spatny and his team, who created a new production-ready model optimized for rendering with detailed geometry and texture. The other two submarines and the freighter were created in Maya.

The most complicated shots involved a blend of live action and CGI in the climactic battle. The Foxtrot had to get right under a freighter, sit in the turbulence of its wake, and then glide between its two propellers.

"Our shots had to take in bow wakes, propeller wash, floating particles, cavitation bubbles, the relative mass and speeds of the sub and the ship, the rust and barnacles that get knocked loose when the conning tower of the sub hits a rudder on the freighter," Spatny details. "The camera shake on the CG shots also had to match the practical shake on the actors inside the sub in the live-action footage."

Months after principal photography, the aerial team, led

by Werner, took to the air for exciting chase shots. "Aerial Cinematographer Kurt Soderling and pilot Craig Barker literally chased a tanker out of Long Beach harbor," Werner remembers. "It wasn't cost-effective to rent a ship, so we just looked on various websites that list when ships are leaving port. With a list of shots we needed, and the RED Scarlet with the Cooke 24-250 HR zoom in a Spacecam mount, they took to the air, as Todd and I watched on monitors. Later we digitally removed the name on the back of the ship and any unnecessary hints of land."

Werner praises Robinson for his DIY ideas. "There's a missile fire scene where we integrated interiors of the actors in the sub with an actor in the missile tube trying to deactivate the missile," the DP recalls. "Then we shot the missile launching using a miniature, enhanced in effects with more fire. The miniature missile was so low-tech that it was tied to a rope with a sandbag on the end, and when the sandbag dropped it pulled the missile out of the hatch and a smoker went off from below. That's when we cut to a CG wide shot of the missile being launched!"

"What Byron and his team did on *Phantom* was extraordinary," Densham exclaims. "We were packed like sardines inside a sub for weeks, and the results are amazing – richer and deeper than expected."

"We were delighted to work with RCR, who financed the film," he continues. "RCR's chairman, Rui Costa Reis, encouraged us to use innovative and cutting-edge technologies, like being among the very first to combine RED Epic, RED standard and

Canon camera footage in the DI, and staying patient throughout the inevitable teething process. They share our pride in the finished result."

"I can't say enough good things about this crew," Robinson adds. "We were determined to make this project *Union*, because we knew we'd have the best people, with the right experience, who could pull off what we needed in the time allowed. And it really shows on the screen."

"In the end, all that matters is that a plan comes together and works to create an emotional experience," the filmmaker concludes. "And *Phantom*, which is a new hybrid for what can be achieved on a VFX-heavy indie film, combined analog and digital with great imagination. The dedication from cast and crew made me very proud." 🍀

CREW LIST

Dir. of Photography: Byron Werner

Operator: Jack Garrett

Assistants: Shane English, Britta Richardson

Steadicam Operator: Dave Kanehann

Technojib Operator - Devin Atwood

Digital Imaging Tech: Isidro "Cid" Pineda

2ND UNIT

Dir. of Photography: Mark Kohl

Assistants: Andy Kuepper, Noah Henry

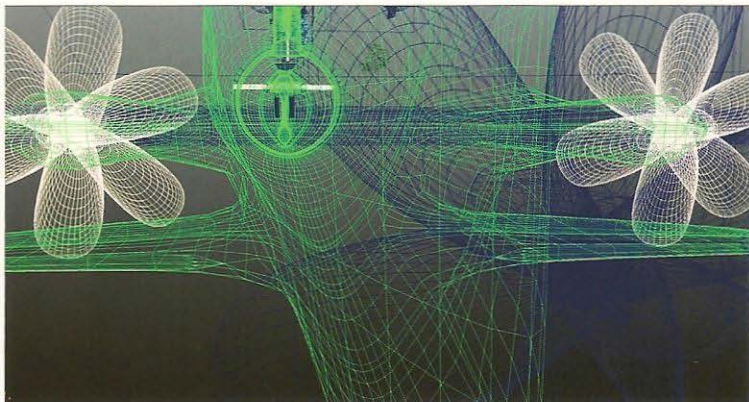
TANK UNIT

Operator: Eric Anderson

Assistant: Dennis Noyes

AERIAL UNIT

Dir. of Photography: Kurt Soderling



Stargate VFX Supervisor says the final CGI Foxtrot model "had more than 600,000 polygons."

