POSTPRODUCTION

Read this article for further information about the digital processes to create a realistic representation of the dogfights.

When *Red Tails* principal photography wrapped, the team turned its attention to building the movie in classic Lucasfilm fashion. "All through pre-production we were planning on 350-500 visual effects shots," says McCallum. "But when we finished shooting, we had about 1,600 shots to produce."

"This is the first time, to my knowledge, that a plane has looked this realistic in dogfights," says Hemingway. "It's really amazing. George and Rick told me early on that they wanted to do the action sequences like they'd never been done before, so we knew that they would never give up until they were done right."

"All this stuff really happened," says ILM visual effects supervisor Craig Hammack, describing the benefits and challenges of making a movie like *Red Tails.* "We can go and find airplanes to use as reference. Everyone knows what that looks like. At the same time, if you don't get it exactly right, people's minds automatically pick it out as something off in the frame."

To ensure authenticity, the visual effects artists closely studied the performance of real P-51 Mustangs. "It's amazing what these planes could do and the speed they can achieve," says Hammack. "On a dive, they can go up to 450 miles per hour and seemingly turn on a dime. It's pretty amazing to see the flexibility and maneuverability of a plane that was built for combat."

Blending the gimbal and green screen work together proved challenging because many of those scenes captured with the actors were constrained to a relatively stationary cockpit. "If the actors are in action or if there's a lot of action going on around them then you can get away with a lot," Hammack says. "But for a large part of this movie, they are flying in formation, talking over the radios, but there's not a whole lot going on around them. So, you get a good long time to stare at what is computer-generated."

The VFX team had to take great care in those scenes to match sun glints and reflections that would occur with the planes at such altitude. "For most of the shots in the gimbal it was shot without glass, so we had to put that in as well. Therefore, we had to fake the reflections and the glints," says Hammack. "If an actor went in a complete 360-roll, we had to simulate that on the computer-generated stuff, which was relatively easy. But, the actor

wasn't going through that light because they couldn't roll the gimbal on set. You cheat the actor by faking some shadows going across them, and then you have to be creative with how you do your computer graphics cockpit, because it has to fit into the same cheats. It got very tricky to be able to make that stuff real."

Then there were the dogfights. "In those wide scenes the planes needed to be doing some pretty dramatic moves and evasive actions," Hammack says. "It needed to be impressive and fast, but there's only so much movement those gimbals can go through and they are certainly not moving fast. For those scenes, we had to go in and manipulate the photography so the actors' faces married into the highly dramatic wide views."