Motion Control—Creating Movement from Still Life
by Kris Fong

After interviewing *Hulk* art directors Jules Mann and Wilson Tang, we were taken on a little tour behind the scenes at Industrial Light + Magic. With production engineer and Mac technician Scott C. Smith playing tour guide, we were led past a massive tank of water (where *Pirates of the Caribbean* is currently in production) to see how ILM uses Macs to capture and preview motion control—a visual effect that gives motion, via camera movements, to stationary foreground and background elements. In *The Hulk*, the picture director relied on motion capture previews to get a sense of how the staged camera movements worked with integral computer-generated sequences and elements.

To capture a typical motion control sequence, ILM's production team mounted a camera—fitted with a CCD chip instead of film—onto a huge crane, called a boom. An operator then maneuvered the boom and camera through the foreground and background elements as dictated by the picture director. As the camera flew through the scene, the CCD captured the sequence and delivered the images straight to an Accom Xtreme digital disk recorder (DDR).

ILM's production team captured motion control footage from a CCD-loaded camera (mounted at the end of this boom), and composited the sequence with other CG elements and video on a Mac. (FYI, that mast in the background is a model for *Pirates of the Caribbean*.) Photo: Scott C. Smith, ILM

Once the team got a good "take," a video technician pulled the images into After Effects on a Mac G4, and composited all relevant CG elements from ILM's network into the video sequence for the director to see how everything worked together. Once they got a sequence where the motion worked perfectly, the team replaced the camera's CCD with film, and the same scene was shot for real.

This is ILM's motion control Mac workstation. The Xtreme DDR (left of the G4) stores the motion control sequence, which then gets composited with the CG elements on the Mac in After Effects. Photo: Scott C. Smith, ILM