

CORKSCREW HILL

Extreme HD in Stereo 3D

The world of special-venue attractions offers fertile terrain for experimentation, especially for motion-based filmmakers. The latest attraction to break new ground is the 4 1/2 minute, computer-animated ride film *Corkscrew Hill*. The film will be digitally projected in 3D stereo-extreme HD (2K X 1280) at Busch Gardens in Williamsburg, Va. via DLP projectors and HD servers.

A Kleiser-Walczak Production, *Corkscrew Hill* was written and directed by Jeff Kleiser and Diana Walczak, who previously created the Universal theme park attraction

by *Ellen Wolff*

create an indentation. It responds to the direction that you're pushing and the power with which you're pushing."

Walczak first roughed out a general shape for each model and then worked in higher resolutions and closer views to sculpt more precise features, such as eyelids.

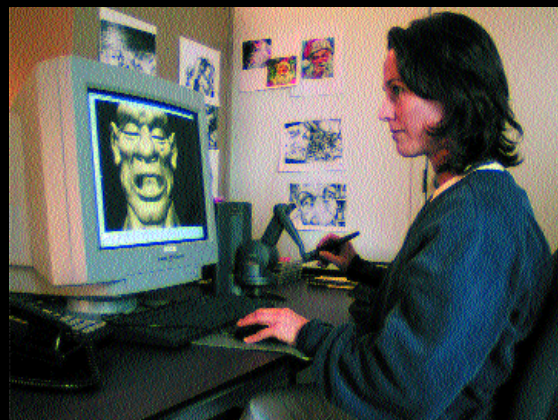
"She could 'dial up' and insert as much detail as she

ONE



Ruth Sanderson's original painting of the pub.

TWO



Diana Walczak sculpting Duncan's head with the FreeForm system.

The Amazing Adventures of Spider-Man.

With their latest ride film, Kleiser and Walczak have pushed in a new direction—literally. They digitally "sculpted" the film's cast of animated characters using haptic technology from Woburn, Mass.-based SensAble Technologies. The FreeForm haptic system, which consists of software running on a Windows NT computer and an input device called "the Phantom," allowed filmmakers to "touch" each character model displayed onscreen and mold a wide range of naturalistic expressions for their CG cast. Essentially, they treated each digital model as if it were a maquette.

"Each model started out as a cube, which Diana worked like she would a sculpture," Kleiser explains. "It's amazing to 'feel' this—you can bump up against it and push on it and mold it like clay. If you push on the forehead, you'll

needed," says Kleiser. "It's an efficient database. There's high detail where there needs to be and less detail where it's not required."

Walczak manipulated the Phantom to create the different facial shapes that comprised each character's basic expressions and phonetic positions. She was able to work quickly, creating a complex character in about a day.

The resulting "sculpted references" provided animators with an idea of what each character's face should look like.

"We spent a long time getting these characters' facial shapes to be correct, so when we got into animation everything could be animated quickly," Kleiser adds. He notes that it was necessary to put in the extra effort because the script slated humans and mythical beasts for close-ups on a 30 by 40 foot screen.

The Kleiser-Walczak team translated the data generated

by the FreeForm system into Maya using a conversion program from Santa Clara, Calif.-based Paraform. The subsequent process of modeling, animating, and rendering in Maya was complex because of the high level of detail involved.

"We have forests of gnarly trees with thousands of leaves," says Kleiser, "and these characters aren't wearing Spandex like the Spider-Man characters did—they're wearing tweeds!"

Filmmakers used SGI computers for the early choreography and modeling but turned to Windows NT machines (from Dell, HP, and IBM) for more complicated and detailed scenes.

"We had to get the performance for our artists that you can only get out of NT boxes," Kleiser notes. Artists also used Macintoshes for painting textures with Photoshop. Of course, traditional 2D painting tricks are of limited usefulness in a stereoscopic film. Your eye can spot 2D ma-

terial as a flat painting rather than as a dimensional object in 3D space.

"A particular challenge was analyzing how far an object can come forward in a '3D moment' before you start to lose a significant portion of the audience's ability to focus on it," says Kleiser. "At some point, a percentage of the audience can't see it in 3D anymore. The further you bring it out, the more and more people you lose." Kleiser-Walczak tested images extensively with audiences to discern where their 3D effects became invisible.

When visitors to Busch Gardens climb aboard the 60-seat Reflectone platform to experience *Corkscrew Hill*, they will be watching 3D stereo images projected in a new way. Minneapolis, Minn.-based systems designer Electrosonic, who collaborated with Kleiser-Walczak on *Spiderman's* 70mm film systems, configured four Barco DLP digital projectors by rotating them on their sides. Two projectors handle the left and right eye images for each



Duncan's head fully textured, including hair, rendered over black.



Duncan in the pub, fully rendered.

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half of a vertically divided screen.

"By doing edge blending down the middle, we basically got film resolution," Kleiser explains. "It looks phenomenally bright and sharp and the 3D works really well."

One of the advantages of keeping *Corkscrew Hill* in the digital realm from start to finish, says Kleiser, is that filmmakers avoided the sometimes nerve-wracking film-out process.

"If one frame is bad then the whole thing is bad," notes Kleiser. "Whereas with data, if you have a bad frame, you just re-render that frame and insert it."

In designing and executing the ambitious project, Kleiser admits that filmmakers filled the film with "a lot of stuff."

"When it's your project, you tend to pour everything into it," he laughs. "We got carried away!"



C R E D I T R O L L

Writer-Directors: Jeff Kleiser, Diana Walczak
 Executive Producer: Patrick Mooney
 Producer: Molly Windover
 Production Designer: Kent Mikalsen
 Character and Animation Supervisor: David Baas
 Lighting Supervisor: Leonardo Quiles
 Modeling Supervisor: Gerard van Ommen Kloeke
 Character Designers: Leonardo Quiles,
 Diana Walczak
 Scene Illustrator: Ruth Sanderson