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## TECHNOLOGY AND BUSINESS

### SPECIAL EFFECTS

#### Pictures Worth a Thousand Cameras

Kurt Vonnegut's *Cat's Cradle* depicts a world in which a substance called ice-nine causes water molecules to freeze solid. As a consequence, any living organism that touches it turns into a statue of ice. When Hollywood decides to make the movie version of the book, the cinematographer might want to contact Dayton Taylor. The New York City-based production manager for independent filmmakers has devised a special-effects technique able to produce frozen images eerily similar to the ones concocted from Vonnegut's imagination.

For his system, Taylor cobbled together in his kitchen an array of 60 interconnected cameras (*below*). All the cameras share a common film magazine: each one contains an unexposed frame of the same strip of motion-picture film. To take a picture, the camera shutters all open at the same time. The film registers 60 separate photographs of the same image; only the viewing angle varies slightly (1.5 inches separates the center point of each lens). The photographer then turns a hand crank that winds the 10 feet of film until each camera is again fitted with unexposed film.

The 60 still shots can be shown in sequence as a strange three-dimensional movie in which people resemble the models encountered at Madame Tussaud's Wax Museum (*photo sequence at right*). One of Taylor's images reveals the right side of a youth jumping in midair, then slowly moves to show his left side. A similar right-left perspective highlights drops of champagne spurting from a bottle.

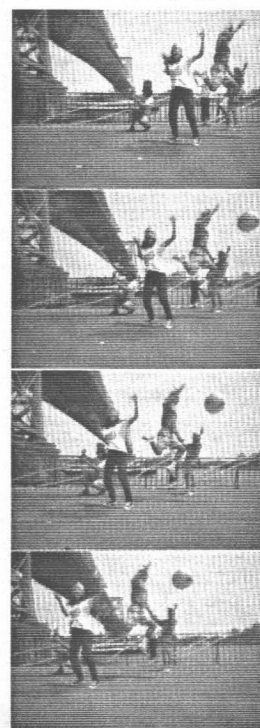
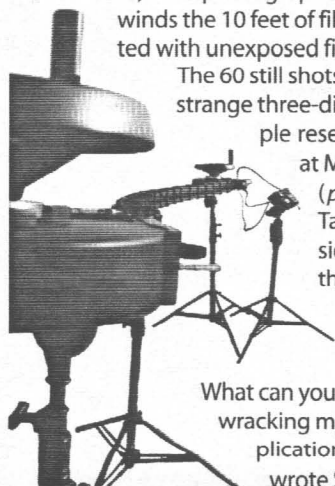
What can you do with 10 feet of cameras? "I'm wracking my brain trying to think about applications for this art form/technology," wrote Steven Spielberg to an acquaint-

ance after witnessing a videotape of Taylor's invention. Taylor believes the main use will be for special effects in films—and, in fact, a French production company used a similar technique in crafting a music video for the Rolling Stones. Apple Computer's QuickTime VR also allows a computer user to navigate through photographic scenes in a similar three-dimensional way.

Taylor's camera array, for which a patent is pending, is limited because it records only an instant or two of activity before the film must be wound forward. As the cost of digital photography and the size of cameras diminish, this limitation may disappear. A camera array, perhaps containing thousands of tiny units, could record a three-dimensional perspective of an event as it progresses over time, thus providing a novel form of interactive video. Engineers could build camera arrays into the cylindrical wall of a space shuttle, enabling students around the U.S. to move about the interior of the spacecraft by manipulating a joystick. A television viewer might choose to watch the finish of the 100-meter dash from in front of or behind the runners during the Olympics in Sydney in the year 2000. The promise of such an interactive system may allow designers to drop the adjective from "virtual reality."

—Gary Stix

Examples of this special effect can be viewed at <http://www.sciam.com/>



PHOTOGRAPHS BY DAYTON TAYLOR