VIRTUAL

Three Bay Area artists have developed unique and innovative uses for Silicon Graphics' technology—Todd Rundgren is creating an interactive virtual performance environment to be used live during his performances, the Grateful Dead is incorporating Silicon Graphics' computers into 3D pre-production for stage and lighting design, and D'Cückoo is already using the IRIS Indigo to generate interactive 3D images during their live performances *(see sidebar)*. Each of these artists is taking Silicon Graphics' technology into infant territories, exploring the element of 3D in audio and video entertainment.

Todd Rundgren has a long history of involvement with computers, having developed one of the first paint programs for the Apple II, as well as having pioneered the merging of computers with video during the 70s. Rundgren explains, "I've always been interested in the non-representative qualities of computers, especially those that can be displayed in real-time."

In recent years, Rundgren has become increasingly interested in the challenges of virtual reality. As he points out, "It's difficult for computers to display human movements interactively and photo-realistically. It is much easier for the computer to do abstract shapes with limited colors that enable the user to interact with the system in real-time." This interaction of data and computer has been accomplished for the most part by using a glove that transmits positioning information to the computer via sensors on the various joints of the hand. The

computer uses the information to locate the user within a computer generated environment. Recently, companies like VPL and Pacific Data Images have been experimenting with data interaction using "virtual suits" for the entire body.

Rundgren would like to use a virtual suit for an upcoming performance planned for the SIGGRAPH 92 Film and Video Show which will take place this summer in Chicago. The project began a few years ago when he was approached to perform for the annual event. Pulling all of the necessary resources together has taken some time, while the technology has moved ahead rapidly. The successes of virtual reality products, such as Nintendo, which uses the VPL glove for home video games, have made the virtual reality concept more assessable and better understood by a larger audience.

Because of this, Rundgren feels the time is right to use this technology on stage in what he refers to as the virtual performance. The idea is to have the performer in a virtual suit, with the effect being the placement of a synthetic performer within a computer generated environment. By wearing the suit, Rundgren will be able to control the virtual performer from a location off stage, being free to interact with the objects contained within the virtual environment. The audience will witness the virtual reality as it is projected on the screen at the front of the stage, while the performance revolves around a song that Rundgren has written specifically for this purpose. When questioned about the goal of this show, Rundgren explains, "As

with most of the things I get involved with, I'm not totally sure of the outcome. The purpose is to explore the technology that is now available."

Rundgren also realizes that at the SIGGRAPH 92 Film and Video Show, the audience will be familiar with most of the equipment being used. "That is something I have to deal with," he says. "This audience won't be as forgiving as one that gets excited over the technology of video games. My overall goal is to have them forget the technology and enjoy the show."

To accomplish the virtual performance, Rundgren plans to use Silicon Graphics' VideoLab and VGX workstations. However, preproduction testing is on the Personal IRIS that Rundgren's digital video production company, NUtopia, has been using for software development and production. David Levine, chief programmer at NUtopia, and Rundgren have been using Silicon Graphics' equipment for several years. Also working with them on the virtual performance for SIGGRAPH 92 will be Silicon Graphics engineers Peter Broadwell, Paul Haeberli, Jeanne Rich, and Roger Powell. Powell joined the Silicon Graphics' Digital Media group last year and is also the keyboard player in the band Utopia (with Rundgren).

Getting the performer involved interactively presents many obstacles which need to be overcome, such as the suit—not exactly available at department stores—and the whole idea of real-time interactivity for the performer, how much motion will be available and with what kind of controls, among other considerations. It is likely

PERFORMERS

By Richard Kerris

that a suit will have to be custom made, or an existing suit be enhanced for this type of performance. The list of obstacles is greater than this, but Rundgren is determined to make the virtual performance happen. "If it doesn't happen for SIGGRAPH 92, we will continue to pursue it for future shows that could conceivably support such a production."

Recent meetings with Silicon Graphics engineers have given Rundgren more confidence that the virtual performance can be achieved this year. "With real-time performance capability, Silicon Graphics is the only platform I can conceive of that could handle a project such as this," Rundgren states. "Something of this magnitude takes involvement from people who are very close to the source of the technology." Silicon Graphics' past involvement with the SIGGRAPH Film and Video Show has already broken new ground. Last year, PIXAR's Loren Carpenter ran an audience participation portion of the show which was made possible by using IRISVision cards in a PC.

Many results can be expected from this performance. If all goes well and the concept proves workable, the music industry can expect to see more virtual performances in the future. While it may not exactly be on the next Madonna tour, one could conceive of a touring installation for virtual performances in places like San Francisco's Exploratorium and Boston's Computer Museum. The concept is not unlike today's Laserium shows that tour planetariums in most cities.

Looking down the road, Rundgren has a clear vision of what the Silicon Graphics platform will afford performers. "The workstations will allow performances to be less scripted. Right now, our concept is based on a number of predefined scripts that can be invoked during a performance. In the future, it will be possible for the workstation to add variables of its own. The results will be more unexpected because there will be fewer limitations."

Rundgren couples his pursuit of high end workstation capabilities with his avid use of low end systems. He now plans to add an IRIS Indigo to his studio for use in future productions. "With the IRIS Indigo, Silicon Graphics has a product which is affordable by a much wider audience than ever before. I want to see this workstation with the same applications and peripherals available on it as are available on other low end platforms." One only has to pick up the latest Silicon Graphics' Express catalog to see that this goal is rapidly being realized. Each month there are more applications from low end platforms being added to the list for the IRIS Indigo.

Another local Bay Area band beginning to use Silicon Graphics' technology is the Grateful Dead. Candace Brightman, the band's lighting director, has been experimenting with stage and lighting design using an IRIS Indigo with AutoCad, RenderManager, and Creative License. The goal is to provide a virtual environment of an arena, or some other large venue in which the band regularly performs, and allow for the placement of lights, screens, and stage props via the application. This would provide a considerable cost savings for the band who usually must rent out empty halls to test lighting rigs and stage design.

The Grateful Dead is currently supported by a production crew well versed in computer technology. The band is already using MIDI with their instruments for their live performances, as well as a computerized light and video system. The Grateful Dead is interested in the possibility of bringing all of the production elements of the band into a system that can be used to visualize the band's stage design; produce graphics for programs, T-shirts, and other products; act as a real-time triggering device during the performance (triggering video clips, animations, etc.); and digitally mix the audio and video of the performance itself.

The music industry spends millions of dollars each year for tours, videos, and artist promotions. While the musician's medium traditionally has been audio, today the visual aspect has become equally as important. Computers that combine all of these technologies will continue to become more mainstream for these new digital media artists. Silicon Graphics has the technology with IRIS Indigo emerging as the platform. Through performers like Todd Rundgren, the Grateful Dead, and D'Cückoo, Silicon Graphics workstations are finding their way into new markets that bring the technology to a wider audience than ever before.

Richard Kerris works with Silicon Graphics' Digital Media group.