Opera Uses Master Computer Score to Light the Way

Linda World, *Staff Editor*

For more than 30 years, composer Morton Subotnick has worked to develop "a vocabulary of what you see." As early as 1960, he was collaborating with visual artists using light-show techniques to extend the range of expression in music performance—"before the rock bands," he noted. He has worked with choreographers and a variety of media. He has also used imagery in the structure of musical compositions. For example, one series of works applied the biological stages of butterflies (larva-cocoon-butterfly) and their physical form (wing-body-wing) as metaphors to govern waveform transforms in the creation of the music.

Even the titles of his compositions conjure images. "Silver Apples of the Moon" is a work of shimmering delicacy written in 1967 for the Buchla synthesizer. It was the first major composition commissioned specifically for an electronic medium—namely, LP records—and it was the first electronic music to become a classical music best seller.

"It was on Billboard's list of the 10 classical best sellers for three months," Subotnick recalled, "and I would look at that list and begin planning my trip around the world. When my first royalty check arrived, months later, it was for $1,500, and I learned something about classical best sellers, but I didn't make my trip around the world."

Subotnick is one of the handful of pioneers in electronic music who learned the technology of signal processing to integrate form and content in his work. He also collaborated with engineers to develop tools that would support his vision. For example, he worked with engineer Donald Buchla and another composer, Ramon Sender, in development of the Buchla synthesizer. More recently, he worked with composer/programmer Mark Coniglio to develop Interactor, a computer language for programming real-time MIDI processes.

"Interactor can track anything on stage," Subotnick said. It has been compared to graphics interface software that lets users create a path through a database of 3D graphical objects. In his new chamber opera, *Jacob's Room*, Subotnick used it to develop a master computer score that lets him choreograph and cue the opera's lighting and video imagery as if they were performers in the opera.

The opera takes its title from a Virginia Woolf novel and its dramatic situation from a passage in the novel where a young man, Jacob, is sitting in his room, reading Plato's *Phaedrus*—a classic text from philosophical idealism. The passage includes suggestions of less than ideal reality outside his room, but Jacob remains oblivious to them until—after reading all night—he puts the book down, goes to the window, parts the curtains, and sees outside "with astonishing clearness."

Subotnick's story is a Holocaust memorial. To the framework of Woolf's passage, he added selections from texts that directly address human suffering. Then he placed the story in Jacob's mind, in a dream, as the young man struggles with remembering and accepting the loss of his family in the Holocaust. "I wanted to carry [Jacob's situation] to modern situations," Subotnick explained, "where we are aware constantly, often subconsciously, of the terror that's going on in the world and that we don't want to see."

Subotnick conceived the lighting and video imagery for the opera as a unit, and he uses them to delineate Jacob's dream and thus to reveal the layers of his consciousness. The stage has a black floor and black scrim. It is empty except for two on-stage performers: a cellist and soprano vocal artist Joan La Barbara, who plays Jacob's mother and a "foreign woman" from Woolf's text, as these figures appear in his dream. When the lights are off, the stage is pitch black, so the lighting can pinpoint, for example, just a hand. Subotnick uses this ability to "abstract" the on-stage performers as a way of showing "the dream present."

The imagery projected against the back wall has more specific references to memory. Subotnick worked with video artists Woody and Steina Vasulka, pulling from their large archive of World War II documentary footage, which they transferred to video for processing. "These are general documentary records," Woody Vasulka said. "We got them mostly from war films, for example, *World at War*. But they're recoded now into objects that have a more theatrical meaning. They're not really documentary any more, but they still carry that kind of charge." In addition to the war footage, the video imagery includes footage of LaBarbara in her dual role, which the Vasulkas shot directly in video in their studio. Using a Rutt-Etra processor they then worked with Subotnick to transform both sets of images into a uniform style.

"The Rutt-Etra is an analog processor," Woody Vasulka explained. "It was one of the early scientific visualization tools, used for various modes of display for time and energy events. It's a knob operation. You could do the same thing in digital, but this lets you control events in real time."

Jacob's Room equipment list

Audio:
- Yamaha DMP7 digital mixers (2)
- Peavey sampler with 32 Mbytes of memory (1)
- Yamaha TG77 16-voice sound generator (1)
- Alesis 8-track digital audio recorders (2)
- Wireless microphone (1)
- Wireless monitor (1)
- Stereo amplifiers (2)
- Speakers (4)

Visual:
- Laser disc players (3)
- Sharp XG2000U LCD video projectors (3)
- Sun 32-channel MIDI light board (1)

Hardware and software:
- Macintosh SE30
- Interactor

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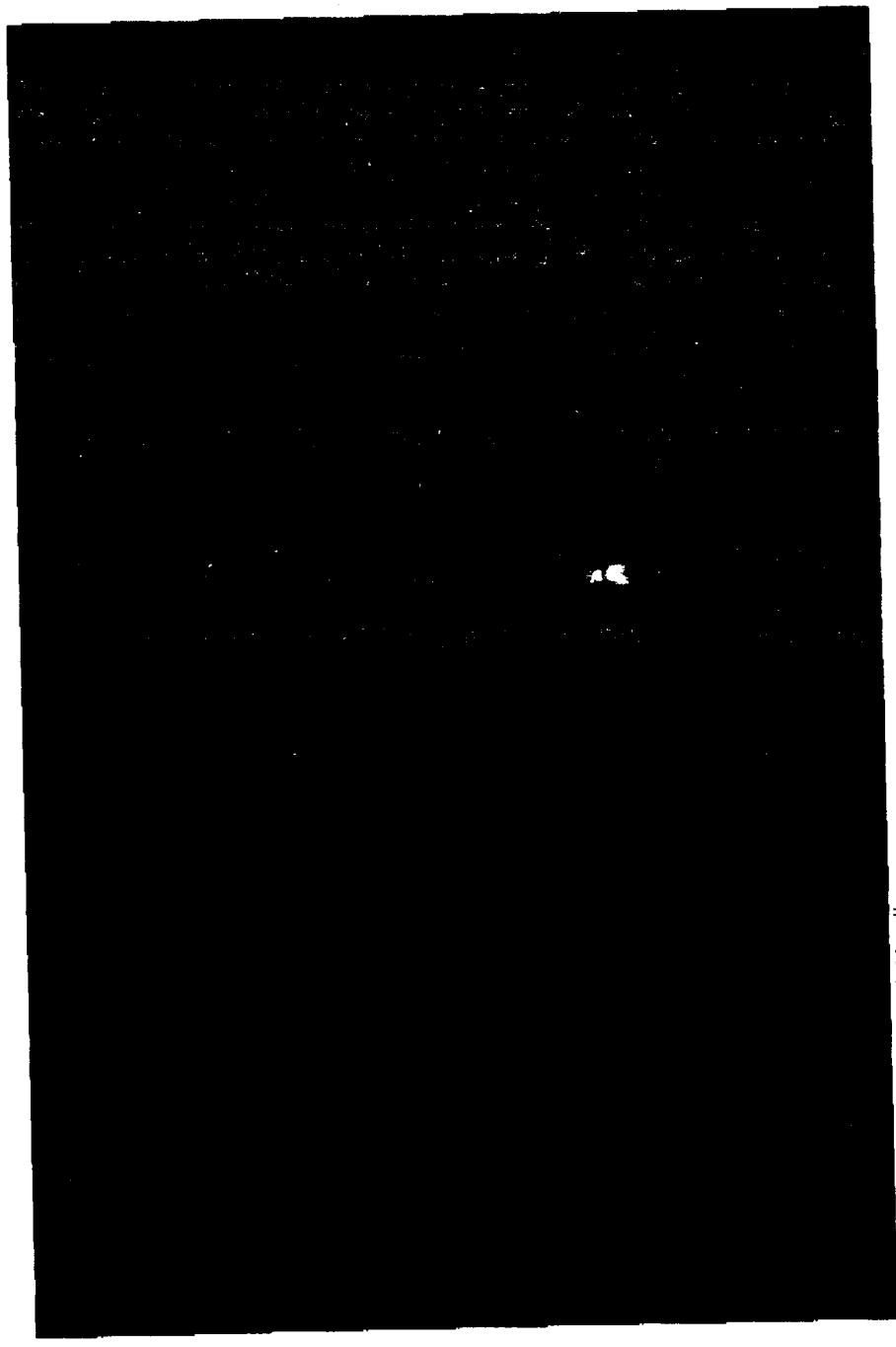

Photo courtesy of Steina and Woody Vasulka

A master computer score controls the display of analog-processed video images—in this case, of the character played by soprano Joan LaBarbara—in Morton Subotnick's opera *Jacob's Room*. The images are stored on laser disc players. The computer operator accesses each image in real time during the performance, and the score automatically displays it through LCD projectors on one of three screens against the backstage wall.

Vasulka also said that Subotnick chose this method of processing to support the original motion and to harmonize with the historical message the material represents.

Riviewing the premier performance in April at the American Music Theater Festival, the *New York Times* described the imagery as ". . . slow-moving, digitally transformed images of faces, profiles, and running crowds. Features melted, froze, and rotated slowly, and were often unrecognizable as human. Projected on three screens, the images had a musciality of sorts: like sonata themes, they recurred in different combinations and permutations throughout the show."

Subotnick described the video imagery as the language of Jacob's memory. "There are very few clear pictures—just really one absolutely clear image at the end. But key images keep coming back and back on the screen and you can make them out. . . . Every person will understand them at a different moment, just as Jacob sees clearly at the end."

Again from the *New York Times* review: "The most wrenching aspect of the piece is that the situations it describes continue to be played out. And the Platonic meditations on morality in Mr. Subotnick's libretto occasionally intrude to remind us that higher ideals have been within reach for millennia but have not yet taken root."

The opera is scored for cello and two voices—LaBarbara's and that of a young man playing Jacob, whose voice is sampled rather than sung live. The opera also includes prerecorded digitally synthesized sounds that are controlled—together with the lighting, imagery, and amplification of the on-stage performers—through the master computer score. In the early development of the opera, the master computer score followed the tempo of the cellist, and LaBarbara called up the video imagery through a sensor in the breastplate of her costume. "There was a lot more direct interaction early on," Subotnick said, but as the work came together and became more set, it was easier to have a computer operator "play" the master computer score.

In addition to composing, Subotnick currently codirects both the Composition program and the Center for Experiments in Art, Information, and Technology at the California Institute of the Arts. He sees two ways to use technology in art. One is in the forefront, as a "technological fountain," as he described it, "where you marvel at the way things are being done." The other way is transparent, where the technology heightens and extends experience in subtle ways.

"For me, the landmark in *Jacob's Room* is that you don't think about the technology when you experience the piece. . . . Its drama could not be there without the technology, but you're not experiencing technology. You're experiencing the theater at that moment."

Jacob's Room is scheduled for performances in New York City in November. Portions of the music are available on CD from Wergo Records. ❑