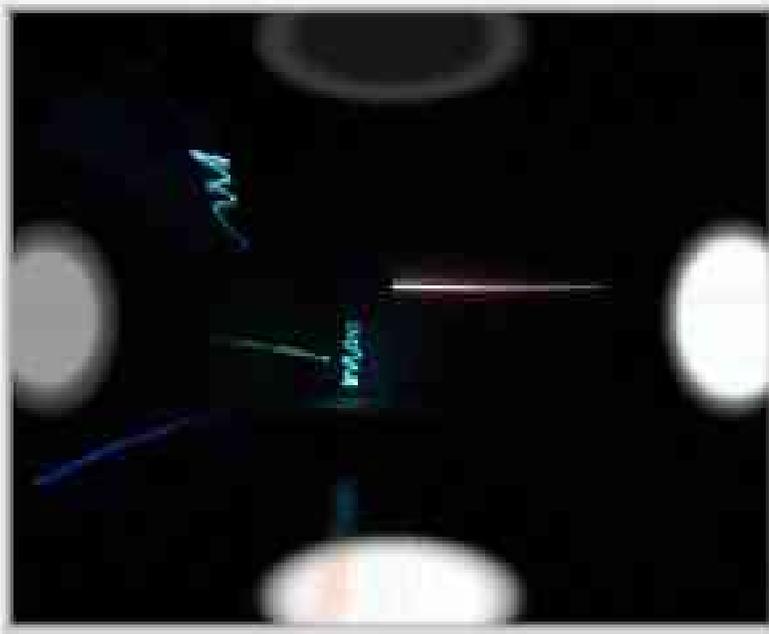# Echo Evolution
Artistic Concept and Technical Realization
Phase 1 (Spring 2000)

Liz Phillips
responsive sound and light installation

software by Michael Wu
neon by Ken Greenberg

In ***Echo Evolution*** , an interactive light and sound installation, the audience can wander and forge trails in a multi -media landscape. *Echo Evolution* creates an open system within the gallery environment. . The collective activity of the audience is sensed with ultrasonics to transform a set of sound and light structures. The installation is modeled to be fragile and resilient like a plant, always adapting to a changing environment. . Events (in 3-D space and time) are weighted, balanced and proportioned , initially as potential energy(voltage) and later as digital material. The output is expressed as a tactile synaesthetic experience,   tuned to come alive in the installation space.

Sounds in this piece are made from processed samples of spinning objects: a brass ring, a prayer bowl, a rainstick, and the rim of a wine glass. These objects were chosen because of how they evolve and transform to describe space, time, and motion. The main sound engine is a Kurzweill K-2000 Variable Architecture Synthesizer.   It is interfaced with an IBM computer system with custom made software programs in C++ designed by Michael Wu, software engineer, Post-Graduate MIT Media Lab. The computer receives sensor data via MIDI from a sensor system, which includes four ultrasonic Rangefinders@ (developed by Polaroid for automatic focus of cameras).   The computer software allows a graphic coordinate system to track and locate audience activity.   Sound can then be sent directly back to the audience /participants with unique acoustic perspective. The program also provides multiple analyzers for each sensor path. Speed of movement, stillness, near and far acts and the distances between people are charted to activate and characterize the sound and visual events.

Neon light forms are made using Ken Greenberg's new patented processes for moving light within the glass through the excitation of different gases to change color and light to different levels. In the installation three long horizontal tubes register where activity is by light presence and absence. I have co-designed two more neon shapes to be like vases (as if shifting shape on a pottery wheel) spinning in and out of existence. High frequency and amplitude modulation of the neon shapes can create light mirages not unlike the way a television raster scans to recreate image, but here it will be in three dimensional space.

In *the video document* (Spring 2000) of *Echo Evolution* Anney Bonney has recorded video images. They were developed as time-processed renditions of the original spinning objects that made the sounds in the installation. The shape of the vase as it is rubbed and sings, brass rings spin in slow motion articulating the geometry of their orbits create an inside view of the hybrid composition.

History of the Installation

Echo Evolution was first installed at The Kitchen in NYC in 1999 for three weeks in September and later at The Hudson River Museum in Yonkers NY for three months as part of the exhibition The Magic of Light". In 2002.

Technical Requirements for Installation

This installation needs a dark, quiet space approximately 8 meters by 6 meters.
It uses four Professional Loudspeakers, 1 dedicated bowl loudspeaker, 1 surround sound amplifier, a Micron Computer, a Kurzweil K2000 synthesizer, 5 custom made neon transformers and five special handmade tubes, Lexicon remote and processing equipment, a custom made analog to midi box, a custom made system for four ultrasonic sensors, and many cables and little power supplies.