

Matt Heckert

Machine Sound

After working for 8 years building machines for performances and producing soundtracks to accompany them, in 1986 I began to experiment with the idea of using the machines themselves to produce some of the sound, then all of the sound. In 1988, I began work on the Mechanical Sound Orchestra.

The criteria for this project were:

- To build machines that were "playable," in that each would have a variety of timbres or rhythms they could produce;
- They would be remote controlled via a computer interface;
- Performances would consist only of sounds produced by the machines at the time: no tapes, samples or any other auxiliary sound would be used. This was very important, as I wanted to create a situation where all motion produces sound, and any sound could be traced to its source at that time. I wanted live performances to have the immediacy of an improvisational situation.

I found that when a mechanical device performs a repeated task by remote control, an observer tends to believe the device is somehow expressing some kind of autonomous emotion--frustration, desire, xxx -- thus creating the mystique of an intelligent or sentient machine. This is not a sound issue, of course, but one which deals with the audience/performer relationship and the audience's perception that some sort of non-verbal communication is taking place.

With the machine's movements controlled by a Macintosh computer running MIDI sequencing software, a finer degree of control is possible than if it were controlled by manual switches; in addition, timing structures can be used that otherwise would be physically impossible. For instance, in one beat I can send a servo motor from zero to full speed, and back to zero 4 times, using a 120 bpm

clock. This can also be repeated with accuracy, as it the computer doing the switching.

Continuous controllers are used to vary motor speeds and note events are used for switching transistors and it is this information that is recorded by the software. Once recorded and stored as a sequence or sub-sequence, any series of control commands can be used at any time. When called from the computer keyboard, control information is sent out instantly and the system responds much like any MIDI controlled electronic instrument, but the big differences are the inertial delay encountered when stirring a machine out of rest and the fact that the sound is coming live from machines.

The inertial delays vary from machine to machine, with some smaller ones being only milliseconds, to larger machines that won't get going for 1 to 8 seconds. This gives a sort of push-pull feel to playing live that is more like working with a human-powered band.

The other sounds present are what I refer to as auxiliary or secondary sounds. These are the various motor hums, solenoid clicks, metal creaks, air exhaust and so on, that are not the primary effects I was after in designing a particular machine, but the ones that come along with its operation -- much like the inhale of a horn player too close to a microphone or the finger-squeak on a guitar or violin neck, my machines breathe and stretch in their own ways.

Having this type of control interface allows me to respond to the differences in the acoustic dynamics of a specific location as well as to improvise new compositions during performances.

What I hope to provide is a greater sense of immediacy for an audience, with some feeling of being inside a system or mechanism. This feeling is enhanced by the way the machines are presented to the public -- not on a stage out of reach, but spread throughout the performance space so the audience can be in close proximity to the instruments.