The Architecture Machine Group, M.I.T.
Seek 1969-70

Seek is a sensing/effecting device controlled by a small general purpose computer. In contrast to an input/output peripheral, *Seek* is a mechanism that senses the physical environment, affects that environment, and in turn attempts to handle local unexpected events within the environment. *Seek* deals with toy blocks which it can stack, align and sort. At the same time, these blocks form the built environment for a small colony of gerbils which live within *Seek*'s three-dimensional world.

Unbeknownst to *Seek*, the little animals are bumping into blocks, disrupting constructions, and toppling towers. The result is a substantial mismatch between the three-dimensional reality and the computed remembrances which reside in the memory of *Seek*'s computer. *Seek*'s role is to deal with these inconsistencies. In the process, *Seek* exhibits inklings of a responsive behavior inasmuch as the actions of the gerbils are not predictable and the reactions of *Seek* purposefully correct or amplify gerbil-provoked dislocations.

Seek consists of a 5x8 foot superstructure supporting a carriage which has three dimensions of freedom. Its extremity is composed of an electromagnet, several micro-switches, and pressure-sensing devices. This elementary prosthesis is guided by the blind and handless computer to pick up or deposit its payload of a single two-inch cube. The nucleus of the system is an Interdata Model 3 Computer with 65536 single (yes/no) bits of memory which are shared by instructions and data.

Even in its triviality and simplicity, *Seek* metaphorically goes beyond the real-world situation, where machines cannot respond to the unpredictable nature of people (gerbils). Today machines are poor at handling sudden changes in context in environment. This lack of adaptability is the problem *Seek* confronts in diminutive.

If computers are to be our friends they must understand our metaphors. If they are to be responsive to changing, unpredictable, context-dependent human needs, they will need an artificial intelligence that can cope with complex contingencies in a sophisticated manner (drawing upon these metaphors) much as *Seek* deals with elementary uncertainties in a simple-minded fashion.

Seek has been developed and constructed by M.I.T. students who form part of the Architecture Machine Group, a Ford Foundation sponsored research effort within the M.I.T. Urban Systems Laboratory. The participants have ranged from freshmen working in an Undergraduate Research Opportunities Program, to post-graduates designing elements as part of their research assistantships.

The co-directors of the group are Professors Nicholas Negroponte and Leon B. Groisser, of the faculty of Architecture and Planning. Randy Rettberg and Mike Titelbaum, students in Electrical Engineering, have been in charge of the electronics—in particular, the interface and controller. Steven Gregory, a graduate student in the School of Architecture and Planning, has been in charge of the programming. Steven Peters and Ernest Vincent have been responsible for the actual construction of the device.

Following the Software exhibition, Seek will return to M.I.T. to be used with many different detachable heads as a general purpose sensor/effector. *Seek* will become a frame for experiments conducted by students in computer-aided design and in artificial intelligence.

Nicholas Negroponte (left) with Karl Katz and Steven Gregory