DISTANCE - ZERO

An Environment in Space-Time

By Ardison Phillips and John Forkner

In the sixteenth century Copernicus displaced man from his privileged spot at the center of the universe. Early in this century Einstein seriously disturbed another of man's anthropocentrisms - Time. His theories of relativity reduced the status of time to that of a co-partner to the three spatial dimensions. With this, the concept of four-dimensional Space-Time was born..that is, for mathematical physicists. Psychologically, the equivalent to this epochal redefinition of time has remained unknown and unexplored in the western world until fairly recently. The new literature on expansion of consciousness gives abundant evidence that mystics and sages have been able to directly perceive unitive space-time, perhaps since the beginnings of human evolution. The techniques they describe for achieving such extended awareness require an intense personal spirituality usually not developed by most of us in our western culture. Can we create an environment that might allow larger numbers of people to re-explore their own personal time dimension?

Ardison Phillips, artist, and John Forkner, physicist, have been experimenting for nearly four years with non-imaging spaces that seem to be conducive to the experience of altered time perception. Forkner describes the evolution of the ideas that were ultimately realized as the "Distance-Zero" environment.

"At the start of our collaboration we were both intensely involved in designing and constructing optical image environments for Japan's Expo '70. Ardison was working with Experiments in Art and Technology, Inc. on a 90-foot diameter spherical mirror space for the Pepsi Cola pavilion, and I was working with artist Bob Whitman on a holograph-like mirror image space as part of the Los Angeles County Art Museum show in the U. S. pavilion. I think it was a natural outcome of our work on each of those projects that we both became extremely aware of the special conscious impact of visual sensory data as contrasted to that from our other senses. Perhaps for this reason we tended to start our exploration by concentrating on ways to desensitizing the visual aspect of a space.

In the modern western world we scarcely notice this sensory imbalance, since we are immersed in it. This unconscious visual emphasis seems to be something that we have learned through constant exposure to geometric structure in our environment. Nearly everything in our society is made up of linear structural elements: buildings, streets, railroad

tracks, chairs, tables, books, pencils, letters, symbols, and on and on. We live in a three-dimensional Cartesian co-ordinate space in which even the graph lines are drawn in! In some parts of the world, particularly in technologically primitive cultures, obvious linear elements like these are remarkably absent from the environment. Ardison suggested that the Eskimo lives in an almost ideally "non-linear" world. An Eskimo traveling in a blizzard has essentially no visual cues for navigation. He must rely entirely on aural and tactile sensations indicating snow texture, wind direction, and temperature changes to find his directions in space. His special sensitivity is even built into his language, which contains nearly 250 words describing qualities and properties of snow. But he doesn't have a noun for snow itself - why name the omnipresent! Ardison had a strong feeling that a radically different sense-space such as this should produce a very different concept of time. I found some remarkable evidence for this in Gontran de Poncin's account in "Kabloona" of a journey above the arctic circle in the company of an Eskimo party. During a particularly severe snow storm they were forced to construct a shelter and wait for better weather. In his words, "An afternoon in an igloo during a blizzard is another element of Eskimo life the quality of which is hard to convey. It is timeless. It is colorless. The mind is void of all thought and image. A man cannot say if he is hot

or cold. Is it three hours or is it twenty minutes that we have sat like this? There is no telling." I can scarcely hope to state what Ardison and I were striving for more clearly than this eloquent description.

But how were we going to be able to de-emphasize the visual aspect of the sensorium for people of western background? Ardison was much taken by one possible approach - the use of coherent laser illumination. He had noticed that the peculiar property of reflected laser light, called scintillation, appeared to destroy the edges that normally bound a volume of space and seemed to flatten it out. The scintillation effect results from diffraction between the tiny bundles of laser energy reflected from adjacent particles of the reflecting surface. The small diffraction patterns appear as concentrations of light seemingly located in front of the actual reflecting surface; hence the space-flattening that we had seen. To use this effect for our purpose it would be necessary to illuminate a rather large space with the laser in order to fill the observer's field of vision. We tried a beam-spreading experiment, using a large argon laser at Elsa Garmire's laboratory at CalTech early in 1971. The results were discouraging in the sense that, although we could spread the laser using suitable lenses, the least speck of dirt created large circular diffraction rings which defeated the idea of a structureless space. This difficulty, together

with the high cost of the laser and its non-availability for an extended exhibit, led us into a somewhat different direction.

I had thought of another way of circumventing the ability of the eye-brain combination to locate surfaces and therefore define a visual space. This was based on the mechanism of binocular vision, one of the ways we sense the distance to an object. I reasoned that our eyes each take a picture of the scene we are observing, and that the subtle differences in the two pictures, due to parallax, are resolved by our brain into the eye-separation angular subtense at the object - from which we derive the distance. What would happen if we presented our eyes with an ambiguous scene, such as a regular pattern of dots? The separate images from each eye can be correlated in the brain in a number of matchings, each corresponding to a different interpretation of object distance. As I suspected, the dot pattern actually appears to be in front of the surface that it is printed on, and its apparent distance changes every time you blink! We did some large-scale experiments with dot patterns, and finally evolved the design of an environmental space. Discussions with Dextra Frankel, gallery director at Fullerton State College in California, led to the opportunity to exhibit the environment, and Judith Thomas, Los Angeles art patron, offered her support.

In this, our first realization of the "Distance-Zero" concept, we were able to embody many of the ideas we had discussed. The visual space itself we constructed as a 13-foot high isoscehedron whose inner surface was covered with paper triangles having a precisely-printed dot pattern. Our experiments had shown that 3/8-inch diameter round white dots, separated by a 1/8-inch gap within a black background, showed the distance-jumping effect very well; especially when illuminated with red light. The paper triangles printed by a commercial lithographic house had to be assembled with painstaking accuracy within the large plywood isoscehedron. (Needless to say, your eyes kept going out of focus during this operation!) To deal with the other sensory elements of the environment we surrounded the central dot pattern structure with a labyrinthine corridor. This was painted black, and was floored by a slowly-rising ramp that gradually brought the observer to the viewing level. We kept the ramp area at a low light-level, and padded the floor so that the elevation change would not be apparent. The aural element of the space was an electronically-generated sound of low frequency with a triangular waveform. The piece opened for exhibit in mid-December of 1971, and seemed to achieve some of our rather ambitious purposes - at least for a satisfying number of the people who went through the experience.

In early 1972 another circumstance appeared in which we had the chance to extend our initial design for "Distance-Zero". The occasion was a three-day conference, "Focus: Shelters for Mankind", scheduled for September, for which an extensive exhibit, including art works, was planned. Our piece seemed natural as an inspirational element within a conference that encompassed such visionary concepts as those of Paolo Soleri. We felt very fortunate in having this second try at realizing our ideas, and carefully re-examined all of the details of the design for the Fullerton presentation. The dot-pattern approach had been so difficult to put together, and there were so many flaws in the final result, that we decided to attempt our original laser illumination scheme. First problem, how to get a laser. Fortunately this turned out not to be a problem. A friend, Lou Brown at the Spectra-Physics Company, convinced his management that ours was a worthy project, and they generously loaned us their newest high-power, argon laser for a two-week period, including the conference weekend. (Such a laser costs about $11,000, and demonstration units such as the one we borrowed are in great demand for scientific purposes.) There was a small matter or arranging for the 9000 watts of electrical input power, and the cooling water to remove the major part of it that reappears as heat; only four watts of energy are actually converted into laser light - lasers are still quite inefficient.

The second problem, how to spread the laser beam to cover the inside of our structure without introducing undesirable diffraction rings from dirt on lenses, required some research. I had read somewhere that people doing holography had successfully spread a laser beam using ground glass as the dispersing element, and had avoided the dirt problem that way. Ardison called Alex Jacobson, an expert in holography at Hughes' Malibu laboratory, whom he knew from earlier E.A.T. activities. Dr. Jacobson confirmed that the ground glass trick worked, but wished us luck on trying to uniformly illuminate a space of the size we were talking about. Optimistically we had hoped to have a space some 25-feet in diameter which people could enter and be completely surrounded by uniformly scintillating reflected laser light. A calculation I made, based on scaling up some experiments we did with a small helium-neon laser, quickly showed that we would have to subdue our ambitions somewhat because of insufficient laser power. As a result, we finally decided to stick with our Fullerton structure with its one-viewer-at-a-time limitations, which I felt we could illuminate to quite a high level of brightness (a prediction that was fortunately later confirmed). Again Elsa Garmire at CalTech helped us with a series of experiments that attempted to approach the characteristics of the actual environment space. These were to be our only direct checks on the feasibility of the approach until final assembly of the completed installation. These proved very successful;

the scintillation effect was quite strong - provided that the surface scattering the laser light, as well as the surface meant to reflect the light, both remained quite stationary. The slightest movement blurred the scintillation pattern entirely. This was of some concern, since we hoped to create a seamless projection surface by inflating a 10-foot weather balloon inside of our original isoscehedron structure, painting the inside of it white after attaching it to the viewing opening. Our tests of actual balloon movements, however, showed that these could be controlled to the point where the laser pattern was still maintained.

Having settled on the most technically difficult aspect of the installation - the laser illumination method, and the projection surface - we next concentrated on the aesthetically troublesome problem of leading the viewer in and out of the space in a natural way. We both felt that the entrance treatment of the Fullerton installation was somewhat distracting to the primary viewing area - the dark corridors had a very powerful effect in an almost independent way. To counteract this we decided to light the tunnels with a color complementary to the laser light. The shape of the tunnel now became very important, since you would see the walls. This generally-increased visibility led us into treating the initial encounter of the viewer with the piece very sensitively. We spent nearly two weeks just designing the viewing alcove

alone; building models and full-scale mockups to check our ideas. Then there were the purely technical problems, in addition, that I had to handle in conjunction with spreading and blending the laser beam, which had to be split into three separate parts to work around the viewing alcove without shadowing. But, at this point I think I will take leave of the details of the design of the piece, and let some of the magic remain. Instead, if you will allow, I shall take you on a tour through...DISTANCE ZERO II:

Take off your shoes, please, and wait here a moment. Notice that the low-ceilinged room in which we are waiting is illuminated with a strange, dim, magenta-colored light. This lets your eyes become accustomed to the low light-level inside. A deep, pervading sound surrounds you coming from outside of the room, and seems somehow to fuse and blend with the light. Aha. The attendant says that the space is free now, so you can go in - by yourself, please. The experience is often stronger that way.

After turning through the door a long tunnel confronts you, rising in elevation at a moderate grade. The walls of the triangular tunnel, which is quite high, suffuse a magenta radiance of the same hue as in the waiting area you just left.

Moving up the tunnel you have the sensation of plowing through deep snow because the floor is padded with a thick layer of foam. You are gradually passing out of the magenta region and, in the near distance, you become aware of a triangle of intense, warm green light that grows in size as you approach. The triangle of light expands to nearly the proportions of the tunnel as you enter a peculiar pyramidal alcove which seems to open at one side into a boundless space filled with green light. If you wait a second or two, the space appears to fill with countless tiny motes of light of an almost fluid texture. Moving along into the alcove you discover that you can step onto a transparent floor, and suddenly you find yourself completely immersed in floating green light - filling all of space in every direction. The presence of the heavy, deep sound now seems to merge with the light into a strange, unified sensory impression. You stay...how long? Time seems irrelevant. Somehow, at some point you simply find yourself moving in another direction. One parting surprise awaits you. Exposure to the pure green light has saturated your eyes to the color so that then you face toward the exit tunnel, the modulation of afterimages with the magenta glow

creates an incredible spectrum of colors such as you may never have seen before. As you leave, this spectrum dies down to pure magenta, and you find that you have re-entered the original waiting space.

What did people experience? For many people the general excitement of the whole conference made it difficult for them to shift to the very slow pace inherent in our environment. Cathy, the girl who sat as attendant with the piece for most of the three days, said she finally got to the point of telling people to do things like "Hold your breath and count to ten," to encourage them to slow down.

Initially I had difficulty getting into the flow of piece myself, since I was still carrying around a baggage of worries and frustrations about constructional details.

Ardison seemed to tune into the time experience much more quickly. The first clue you got that it was working for you was when you found difficulty in judging the length of time spent in the space. Most people spent a surprisingly long time inside, and interestingly enough, each spent about the same length of time. They might have wanted to stay longer, but most, including myself, felt a kind of compulsion not to hold back the next person waiting.

Some quite remarkable experiences occurred. Several people had a strong feeling of vertigo in the space (this was also my reaction the first time through). There was a man who said he saw floating giraffes (??). Then, there was a lady who stepped into the tunnel, paused, threw herself down on the foam-padded floor, and then crawled through the entire piece. A woman cried. A friend of mine said she couldn't get into the alcove because there was a gauze screen blocking the entrance. I asked her to go back, and she was able to break through the "screen". This screen was experienced by many people, as I later found by asking questions. The strength of this reaction at first seemed incredible to me, until I recognized that I knew intellectually that there was no barrier, whereas your eyes quite clearly (albeit falsely) sensed that there was one. Ardison and I felt very elated that the piece seemed to engender such a variety of individual reactions. We were especially delighted, too, when we discovered that children kept coming back again and again. It seems that we had, in fact, created an environment that could open up peoples' perceptual space.

Now we could think about the future. In going through the space there was a haunting desire to spend more time in it - to really become totally immersed. Technical limitations, such as the available laser power and the size of the viewing structure, had prevented allowing several participants to be

in the space at one time. We both felt this expansion of the environment to a complete 360-degree space was certainly the next stage, whenever that should prove possible to realize. The Focus Conference version of the piece approached tantalizingly close to our conceptual ideal, and strangely, the experience seems still to be with us, growing purer and richer with the passage of time.