

RR-1

"From Space to Environment" - I

28 Uguisudani-machi
Shibuya-ku, Tokyo, Japan

24 December 1966

Mr. R. H. Nolte
Institute of Current World Affairs
366 Madison Avenue
New York, N.Y.

Dear Dick:

"From Space to Environment" was the title of an exhibition held in Tokyo in mid-November. Participants included graphic designers, architects, painters, sculptors and musicians, although, as one expects - in fact, hopes - in the case of interdisciplinary explorations, categories tended to break down. We arrived too late to see the show, but the subject came up frequently in conversations, and seemed worth attention. Further investigation and the opportunity to see some of the exhibited items confirmed our interest and suggested three main areas of importance: content, motivation and manner. After some necessary background, I'll concentrate on the first of these.

Tokyo department stores are as aggressively enterprising as other Japanese businesses, and, in a typical week, they host a dozen or more shows covering everything from pottery and embroidery to contemporary paintings in group and one-man shows. Though these displays rotate rapidly, ranging in length from one to two weeks, they still effect considerable public exposure. "From Space to Environment," for example, drew over 36,000 persons in six days. The Matsuya Department Store in the Ginza shopping district not only offered a large exhibition space for this somewhat adventuresome show, but provided substantial funds for its mounting, designed by architect Arata Isozaki. The participants were not paid, however, nor were they reimbursed for the considerable expense of supplies or the labor which their products required. But this is not, of course, an unusual circumstance in contemporary art. The attendance and critical attention accorded to the exhibition were apparently gratifying all around.

The motivation of each participant would seem to have been quite personal, though there was, I think, the usual quota of hangers-on for such an attractive idea and important complement of exhibitors. What conceptual unity there was grew from the tacitly shared question: how does one come to terms with an increasingly overwhelming environment? Whether one's "terms" include using new words or redefinitions which may aid one to

see things freshly, encouraging people to respond actively to their surroundings instead of passively accepting them, or employing the jujitsu principle of turning the opponent's (the environment's) strength against him, depends on the individual's outlook and the techniques available to him.

The traditional Japanese idea of "space" is complex - more basic and comprehensive than it is in the West. For them it implies more than physical dimension or relative emptiness. The idea of dimension itself, for that matter, relates to the Western concept of a bounded volume or area; and it is precisely the intrusion of the Western notion of boundary on their freely felt space which has led to their interest in another, newer word, environment. Environment implies - for the Japanese as well as for English speaking people - a less restrictive, more multi-leveled interaction between man and the conditions, objects and structures which surround him at each moment. "Surround" is used advisedly, for man is progressively less able to cope with the diversity and force of his own additions to the environment. Natural elements such as sky and soil are somehow easier to engage in dialogue than our substitutions, smog and cement.

The musical contributions to "From Space to Environment" certainly encouraged exchange, so much, in fact, that they were sometimes overtaxed. Composer Toshi Ichianagi and poet-critic Kuniharu Akiyama each designed exhibits in collaboration with electronics engineer Jyunosuke Okuyama. All are in their 30's. Raised in Tokyo, the bespectacled Ichianagi was trained as a pianist from a young age by the well-known Japanese pianist, Chieko Hara. He also studied composition and won several prizes before going to the United States for a period of over eight years, ending in 1961. During this stay, Ichianagi worked extensively with John Cage, the extraordinary and controversial American composer. Cage's aims - for example, involving the individual with unique experience rather than homage to objects - were agreeable to Ichianagi; and since his return to Japan, he has developed, in a sophisticated and personal manner, approaches related to Cage's activities. His open and surprising music is published by C. F. Peters of New York and is well known to avant garde audiences everywhere.

Akiyama was born and educated in Tokyo, obtaining a degree in French Literature from Waseda University. Though his primary interest is in poetry, his activities cover a very wide range including art, musical and film criticism, teaching, writing, radio and television broadcasts, articles and record jacket notes, and also designing musical constructions. This diverse activity is somehow resolved into a graceful and energetic package. Akiyama has visited Europe and America and communicates well in several languages.

Apparently without significant formal training, Okuyama grew up naturally with mechanics and electronics. After

several years of work as a sound engineer for the Daiei Film Company in his native Kyoto, he grew weary of studio routines, came to Tokyo, and began working with the more progressive film producer Hiroshi Teshigahara ("Woman in the Dunes," "The Face of Another"). Through Teshigahara he met composers such as Ichiyanagi, and the combination of imaginative musical minds and ingenious and uninhibited electronics has been productive for everyone. Okuyama is, in his own words, "always trying to produce new sounds, not just music;" he is pleased to work in close association with composers and their requirements (a situation which would undoubtedly cause discomfort in most engineers).

Ichiyanagi's first efforts in the field which he aptly terms "sound design" came three years ago when the city of Takamatsu on Shikoku Island decided to stimulate tourism by building a new beach. The committee in charge chose to use contemporary art as bait and asked Ichiyanagi to provide sound, while sculptor Mitsuaki Tanaka worked with stone. Ichiyanagi asked that the sculpture be both large-scale and widely distributed. He then placed speakers inside the individual pieces and took advantage of their varied structure to produce different sorts of sound. There were, for example, tall chimney-like objects from which music flowed out and down over the spectators' heads, and other ground level shapes which were more direct. By electronic means, the composer altered and mixed the sounds of traditional biwa music from the Takamatsu locale. The resulting tape music was then broadcast during three periods each day with the practical thought that more might have proved too much. Sound was programed to come from various speakers in turn so that the aural environment was constantly changing, even if one did not choose to move about.

In the Matsuya exhibition, Ichiyanagi collaborated with Okuyama in producing a considerably more sophisticated and satisfying product of sound design. The composer's basic intent, as before, was to provide a shifting and active stimulus which would encourage an awareness of at least one aspect of the environment, but this time he achieved an important reversal.

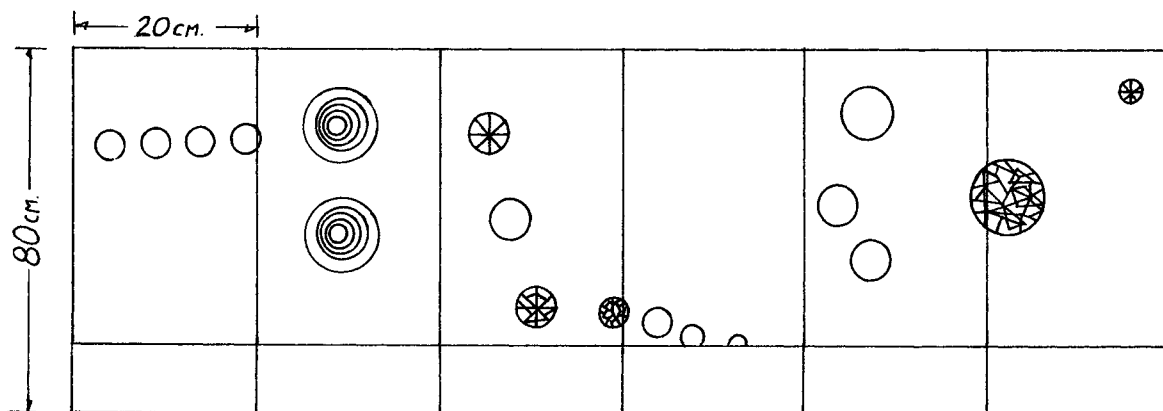
Traditionally, music has been played at a more or less passive audience, and neither its form nor content have been affected by the number or nature of the audience, and probably only in special circumstances by the listener's wishes (unusual enthusiasm pro or con). The traditional listener went to a concert to observe and receive, not to participate and give. To some degree the spread of the many-nobbed phonograph has allowed listener control in the privacy of one's own study, but even there it is minimal.

The turnabout achieved in Ichiyanagi's object will become clear as I describe it. Pictured on the next page, it is a hexagonal column 80 centimeters high. Its plain black plastic surface is interrupted by a number of disks (as Ex. 1 shows), and while it is in operation the circular windows are visually



photo by Osamu Murai

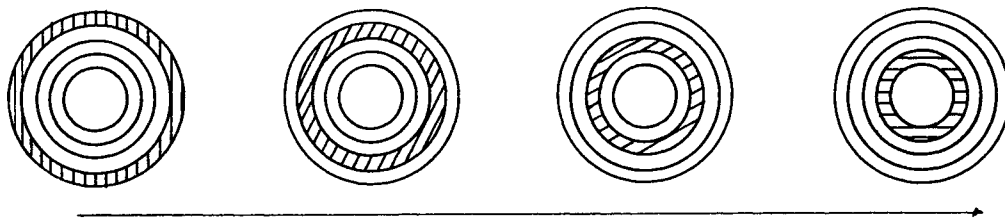
intriguing. The composer has used polarizing films to produce



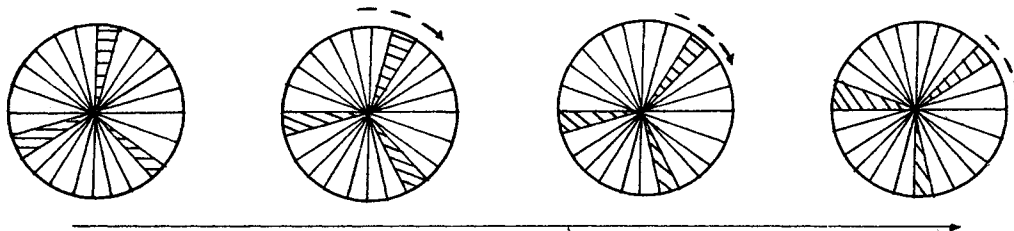
Ex. 1

three kinds of periodic apparent motion: converging concentric circles (Ex. 2), rotating blades (Ex. 3) and shifting complexes (Ex. 4).

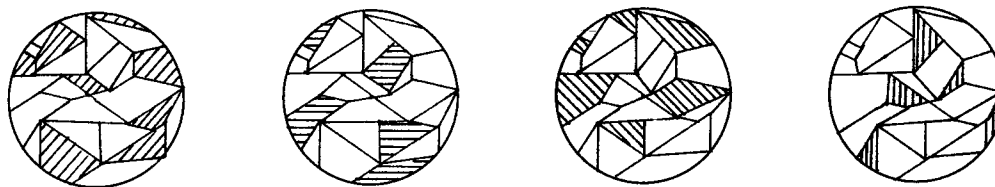
Polarization involves the selective orientation of light energy into one plane. If two superimposed polarizing films are oriented in a parallel way, light will pass through, but if their axes are rotated 90 degrees with respect to each other, the amount of light transmitted will be cut to a minimum. Pieces of film with differing axes of polarization were glued in geometrical arrangements, like the prototypes pictured in Ex. 2-4. Inside the body of the object, four fluorescent bulbs



Ex. 2

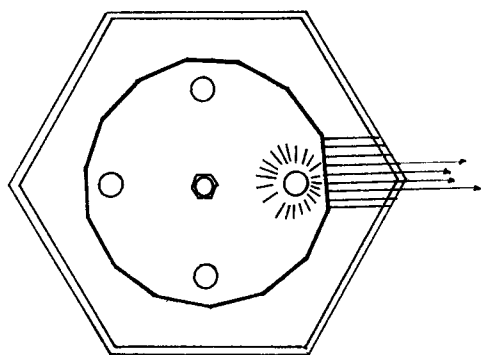


Ex. 3



Ex. 4

are surrounded by a translucent plastic cylinder whose sides are made up of slats of polarized film, each at a different angle of orientation (Ex. 5). The light falling on a point



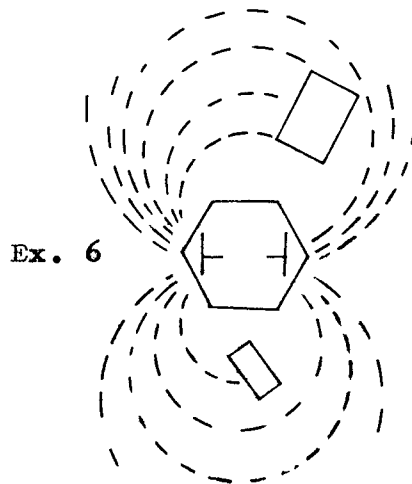
Ex. 5

on the inner surface of the case is polarized by whichever slat of the inner cylinder happens to be opposite it at that moment. In turn, this light passes through whichever portion of the pasted design happens to possess a matching (parallel) orientation. As the inner cylinder rotates, the polarization falling on any one spot shifts periodically, the matches change, and apparent motion is produced.

As one is drawn towards the colorful activity of the various disks (insect to flower), he is surprised to hear a low hum emanating from the base of the object. The sound (a relatively simple sine wave construction familiar to anyone who has heard much of the early electronic music or is cursed with an electronic organ in the neighborhood) changes, primarily, in two characteristics: dynamics (loudness) and frequency (low or high pitch). As one nears Ichiyanagi's object the sound rises more or less gradually, depending on one's pattern of movement, so that by the time both hands are on its surface, the pitch is almost inaudibly high. The dynamic level depends on the bulk of the disturbing object (small dog or large man, finger or arm), and any patterned motion described by a physical object in the presence of the cylinder will produce an analogously patterned sequence of sound.

Here, the device worked out by Okuyama depends on the phenomenon of capacitance. The amount of electrical charge

which can pass between two plates of a condenser depends on the nature of the material (dielectric) between them. In this case, objects in the vicinity of the cylinder's base act as dielectrics between two plates, and, by their nature, change the capacitance of the atypical condenser (Ex. 6). The small differences in electrical flow, in turn, produce slight frequency variations in an oscillator set to operate in the vicinity of 100 kc. The variable oscillator is paired with a second which is invariant at 100 kc. Although a 100 kc. signal is out of the range of human hearing, the difference tones created when two such closely matched frequencies are combined do fall within the audible frequency range. Thus the very slight changes in capacitance caused by the presence of observers is magnified and made to produce an audible result.

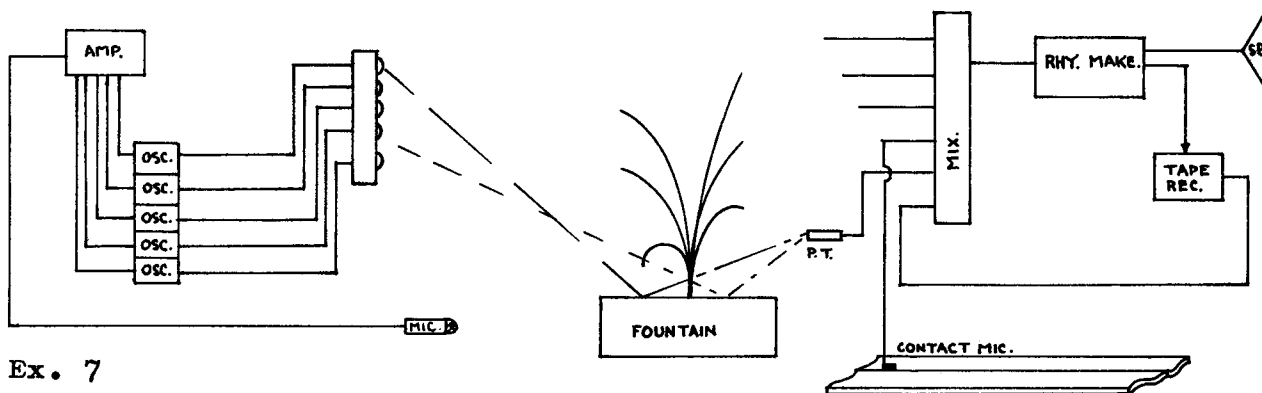


The capacities of the object described above were limited not by lack of imagination on the part of Ichihyanagi or by technical limitations on Okuyama's part. Both would like to have done something more elaborate involving similar opportunities for the actions and desires of the onlooker to affect the music or total experience he receives. Time and the more deadly matter of finances restrained them. The cost in parts alone was in the neighborhood of ¥150,000 (\$416) with no allowance made for the hours of labor and specialized knowledge. Ichihyanagi is now in New York on a grant, and he hopes to investigate the possibilities of using computers to sift and process listener responses. In this way, one might alter the music an audience hears so that it is more in tune with their current needs.

It is necessary to put the above in perspective. Though "sound design" is an important involvement for Ichihyanagi, it represents only a fraction of his musical activity. He is an accomplished pianist, and regularly produces scores - albeit somewhat uncongenial to the traditionally oriented eye - for amalgams of Western and traditional Japanese instruments. Electronic music, recorded on tape, frequently figures in these performed works as do the various black boxes devised by Okuyama in response to the composer's needs. Some of Okuyama's devices have emerged from his crowded but effective home studio into concert situations where they allow mixing, redistribution of components, and various kinds of modulation of instrumental sounds as they are produced in performance. This is another important development. The transformational potential of

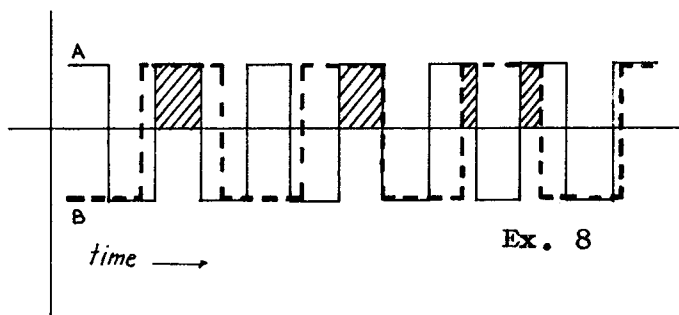
electronic circuits is used in a flexible performance situation, just as instruments have always been. It is not confined to producing (in the laboratory or electronic studio) a fixed product on tape which is virtually identical from one "performance" to the next.

Akiyama's "Environmental Mechanical Orchestra No. 1" is not, as one might guess, a grandchild of George Antheil or Rube Goldberg. It is a more elaborate, less focused effort in the same general direction as the Ichibanagi object. Ex. 7 shows the scheme in block diagram. Briefly, microphones of several sorts



relay signals to various electronic devices which, in turn, pass them through other circumstances designed to rearrange and freshly order them in preparation for redistribution into the environment from which they came, via loudspeakers.

One microphone collects, through the air, sounds made in its vicinity (conversation, footsteps, etc.). These signals are amplified and fed into a bank of 10 tuned oscillators. The complexity of the microphone signal (frequency components and amplitudes) determines which of the oscillators respond and to what degree. Each of the oscillators is connected to one of a panel of lights placed so as to reflect on the surface of a fountain basin; their reflections are received (after considerable breaking up by the uneven surface of the water) by a phototransistor. The phototransistor is sensitive to light, transforming the radiation it receives into electrical energy which is sent to a mixer (by means of which the relative strengths of incoming signals can be balanced).



The mixer is, simultaneously, receiving other signals, including one from contact microphones affixed to the floor boards in the Mechanical Orchestra's area. The mixer output is directed through

an apparatus which Okuyama calls a "rhythm-maker." It employs several square wave signals of different periods in such a way that only when they overlap does an opening in the "key" result. Through the pattern of openings which make up the "key" (shaded areas in Ex. 8), the sound output of the mixer can flow.

What finally emerges from the loudspeakers (In the exhibition there was only one, owing to financial limitations.) is, therefore, a complexly ordered pattern of sound bursts. What one actually hears all stems from his speech and the sounds which his movements produce. But through transformations, delays, and the action of the rhythm-maker, each of the irregularly spaced sound bursts will probably have a quite different content, the origins of which it would be difficult to guess. Some of the key openings will occur at the same moment when the mixer is emitting a very strong signal, while during others there may be almost no output at all.

It is not possible to comment in detail on either Akiyama's conception or its realization because the set-up had been dismantled by the time we arrived in Tokyo. The important features are, I think, the use of materials produced by the environment (as opposed to constructing or collecting materials in some more or less irrelevant locale and applying them where one will) and the fact that these products are then administered, perhaps even flung back at their makers.

I am intrigued by the possibility of attempting to influence the environment by turning its own products back on it. The applications need not be confined to aesthetic instances. If, for example, a coffee house clientele prefers piped-in jazz, and, in order to enjoy it, requires a substantial dynamic level, a second coffee house requirement, conversation, is inhibited. But if microphones placed in each booth noted the onset of any speech, it would then be possible to automatically lower the dynamic level of music in that immediate area. If a good number comes up, dynamic level remains high since everyone listens, while less commanding numbers are automatically repressed by the restlessness they produce.

Other displays in the "From Space to Environment" show used sound while not actually relying on it. Of these, the most interesting and effective was the collection of "finger-boxes" by artist Ay-O who came to Tokyo briefly from his present New York City base. As the picture on the following page shows, a number of small boxes were attached to a wall surface. Each enclosed some object or substance which surprised the visitor with its distinctive tactile properties. Among the most amusing was one containing a familiar novelty store trinket which, when touched, responded with a loud buzz and light shock. Again, the participant (he is no longer a "spectator") must act in order to receive. The manner of his approach and actions



photo by Yoshiyuki Sakai
for Bijutsu Shuppan-sha

which depend so much on doing - should follow suit. If the days of parlor string quartet playing have faded, perhaps something new is on the way.

determines to a significant degree the nature of what he takes away in terms of experience. To focus on the entertainment value and novelty of all the devices I have described would be to miss the exciting implications.

Finally, it should be pointed out that the efforts of Ichiyanagi, Akiyama, Okuyama, Ay-O and others in the Matsuya exhibition are, of course, paralleled by others around the world. James Seawright's recent show at the Stable Gallery in New York City is one instance, and others such as Charles Mattox, Hans Haacke, and Yaacov Agam have worked in this area for some time. The technical complexity which transistor electronics or Grey Walter's behavioural experiments with "mechanical animals" have fostered is more recent. Participation underlies the important fields of kinetic and optical art, and it is good to see that music - the joys of

Sincerely yours,

Roger Reynolds