Frederick Eversley
Born Brooklyn, New York, 1941
Resident Los Angeles

In July, 1969, we invited Frederick Eversley, a Los Angeles sculptor and former electronics engineer, to visit Ampex Corporation. Eversley, accompanied by Hal Glicksman, went to the Redwood City facility where he met Dr. Charles Spitzer, and toured the optics laboratory. In addition to showing the artist their various laser research displays, Spitzer introduced Eversley to liquid crystals. Ampex uses neumatic liquid crystals, which are voltage sensitive, in their computer memory systems. Spitzer also described cholesteric crystals, which have the property of reflecting light at different wavelengths according to the temperature of the surface material. The crystals assume different hues—from pearlescent reds to deep blues—as the temperature shifts. They discussed the possibility of employing cholesteric liquid crystals as an artistic medium.

After this visit, Eversley researched the area of liquid crystals on his own, and in August presented us with a project proposal, excerpts of which follow:

> . . . The specific hue is dependent upon the temperature within the range with a red hue appearance at the lowest range temperature and, progressing through the visible spectrum with increasing temperature, to a violet hue appearance at the highest range temperature. Below and above the specified temperature range the liquid crystals appear colorless. The liquid crystals are completely reversible in their temperature-color behavior and have a thermal response of less than one second. The above described properties of cholestic liquid crystals suggest their use as a display medium on which multi-color images may be constructed by controlling the instantaneous temperature of each selected element of liquid crystal area on the display surface. This proposal defines a project which utilizes cholestic liquid crystals as a display medium and a programmed heat source to create images on the display medium.
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> *Project Description:* The project will consist of performing the necessary R & D, design, construction and image programming of a large scale multi-color environment using liquid crystal compounds as the display medium and program controlled directional heat sources. The environment may take the shape of a flat panel, curved panel, circular enclosure, hemispherical dome or a section of a hemispherical dome.
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> The environment will utilize a structural material (wood, metal, glass, plastic, etc.) as the supporting substrate to which the liquid crystal display medium will be applied. The substrate material may either be opaque such as wood or metal or translucent/transparent such as glass or plastic. If use of a translucent or transparent substrate proves feasible, it will provide a double color effect with the color images on one side being reflected light in nature in a manner analogous to a painting and the color images on the opposite side being transmitted light in nature in a manner analogous to a color transparency.
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> The program controlled heat source may be a laser or a collimated beam of infrared incandescent light. The multi-color images will be written onto the liquid crystal display medium by sweeping the surface of the display medium with the heat beam from the program controlled heat source. Optical-mechanical methods are envisioned to accomplish the horizontal/vertical heat beam sweep in a manner analogous to the horizontal/vertical sweeping of an electron beam in CRT devices. The multi-color image will be constructed by instantaneous modulation (varying the intensity) of the heat source, under program control, during the horizontal/vertical sweep process. The optical-mechanical sweeping mechanism and the intensity of the heat source will be controlled by a tape recorded program. A thermal feedback system will be employed, if necessary, to compensate for changes in the ambient temperature surrounding the environment.
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> The location of the heat source and associated sweep optics may be arranged to permit a limited degree of spectator interference with the sweeping heat beam. This interference will result in the thermal shadows, of varying hues on the programmed images on the display medium surface. These shadows will result in human forms in varying hues to be mixed with the pre-programmed images appearing on the display surface, and in greater active participation of the spectators with the environment. The hues of the various parts of the human shadow form or forms will depend upon their relative speed of movement and their size and shape will depend upon their distance from the heat source.

Ampex agreed to proceed with the project. Over the next few months Eversley continued his research, reading virtually all trade literature on liquid crystals—their properties, durability and methods of application. He conducted experiments in his studio to test various surfaces and techniques of spraying the material. He elected to work this way, independently, before spending an extended period of residence at Ampex. Throughout this time he maintained contact with Spitzer.

As this catalog is being prepared, Eversley's project is still in the research stage. He now wants a three-dimensional matrix of translucent liquid crystal imagery. The crystals would be sprayed onto thin layers of plastic or possibly sheer silk, each layer with a different temperature characteristic and creating a "thermal barrier" for the next. And he has tentatively decided that instead of programming the piece, the kinetic interaction of exhibition spectators should cause the temperature variation and subsequent shifting of hues, by triggering the heat source—a narrow focusing light, perhaps a mercury vapor or tungsten iodine lamp.