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Graphic design on the staromat

Bruce Weinstein

GRAPHIC DESIGN ON THE STAROMAT

By

BRUCE WEINSTEIN

Candidate for the Master of Fine Arts
in the College of Fine and Applied Arts
of the Rochester Institute of Technology

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Advisor: R. Roger Remington

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LIST OF ILLUSTRATIONS

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Media Design Center

Angelo Toscano

Thesis Committee

R. Roger Remington, Advisor
Robert S. Kerr
James Bare

INTRODUCTION

The purpose of this thesis is to investigate the creative graphic potential of the Staromat Photo Typesetter in combination with regular photography and to design and print a series of silkscreen promotional works promoting the Department of Communication Design, College of Fine & Applied Arts, and Rochester Institute of Technology.

STAROMAT

Basics

The Staromat is an automated photo typesetter distributed by the Photo Lettering Division of the Simmon Omega Co., Inc., that is available for use in the Communication Design Department at Rochester Institute of Technology.

As a photo typesetting machine, the Staromat lends itself to special effects. This is because the image is projected through a red filter that automatically swings out of place when the electronically controlled exposure is made by a switch. Since the paper on which the exposure has been made has been predeveloped, the image appears in black on the paper within seconds after exposure. This allows placement of the next letter or image anywhere in relation to the previously exposed one, once the red filter has returned to its blocking position in the constant light path. Previously exposed letters remain in perspective to facilitate spacing. As letters are set their spacing can be regulated by eye or by following the special spacing system on the Staromat. Focusing and exposure time are automatic on the Staromat, although both have manual adjustments that I made use of during my experimentation.

Normally a letter font is used with the Staromat that generally contains all the letters, numbers, and symbols relating to a given font of type. Special symbol fonts are also available. All fonts are approximately 2"x30" and contain a negative ortho type material sandwiched between two layers of acrylic plastic for protection. These fonts allow light to pass through clear areas and produce a positive image on paper or film.

The printing stage on which the paper is placed for exposure may be moved horizontally or vertically. The stage may also be removed to accommodate a circle setting attachment which is basically a round table that rotates on a central point. It was with this attachment that my final results were produced.

There are two normal lenses available for use with the Staromat, as well as an anamorphic lens, which provides a controlled distortion to the image; a series of close-up tubes for extremely small images and a mirror to allow a "bounce" of the image to a wall or easel for larger image production.

The procedure for the use of the Staromat is to select a lens and set the automatic exposure and time setting. Next insert the desired letter font, dial the desired letter (either upper or lower case), set the letter size, pre-develop the paper and place it on the printing stage. The exposure is then made on the paper, one image at a time.

I was basically familiar with the operation and technical data of the Staromat before I began this project. Further knowledge of its capabilities was gained by experimentation with the Staromat and a more complete familiarization with its technical operation through reading the Operational Manual and Service Instructions.

Experimentation

Chemical

At this point I began experimenting to obtain various images using the standard Staromat fonts, lenses, and printing stage. It was at this early stage in my work that I realized adjustments to obtain more precise exposure times would be necessary. The variables I found myself working with were the developer temperature, the type of paper I was using, and the length of time the paper was predeveloped before exposure on the printing stage. I used Kodak D-72 developer and Kodak F-4 Azo paper which had been previously proven as the best combination to use with the Staromat in lieu of the special paper and developer produced by Simmon Omega for use with their machine.

The longer the paper was predeveloped, the shorter the length of time it would sustain on the printing stage before becoming darkened by exposure to stray room light. Also resulting from a longer predevelopment period was a definite lack of sharpness in the image, due to an excess of developer in the paper that scatters the exposure light at the edge of the image. I found that a predevelopment period of one minute or less for single weight F-4 Azo paper at 68-72°F. developer temperature produced the sharpest and blackest image, if combined with a post development period of 30 seconds. I found this to be contingent upon adjustment of

the exposure time so that the fullest blackness of the image is obtained within 5 seconds after the end of the exposure time.

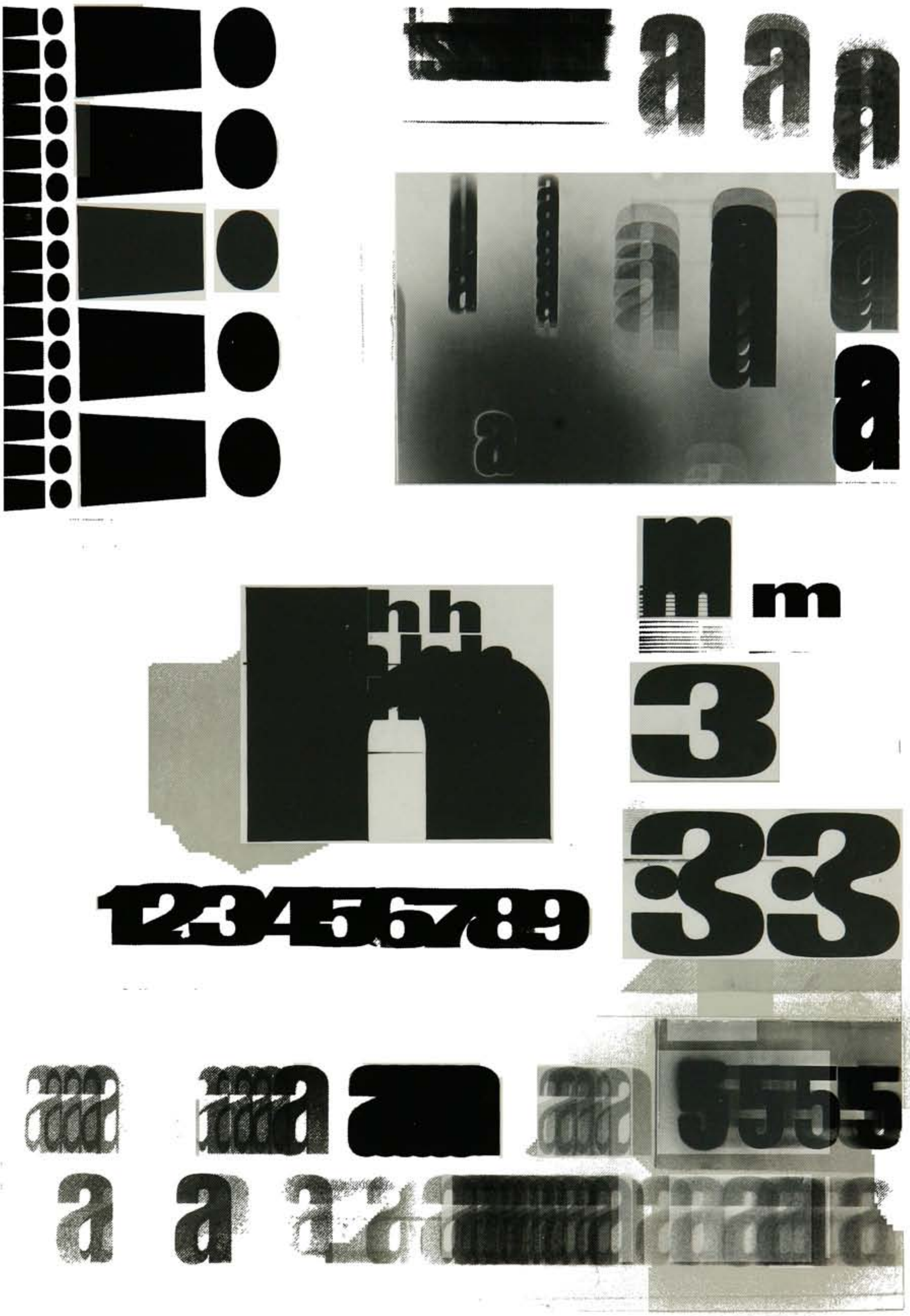
Equally important to the richness and clarity of the image is the complete removal of developer from the surface of the paper while on the printing stage. A rubber squeegee should be used to remove any "puddling" that might occur after initial predevelopment or any further predevelopment while on the printing stage. Any additional predevelopment while on the printing stage by wetting the paper with a sponge soaked in developer should be limited to no more than 2 or 3 times within a maximum 10 minute period. I have found the F-4 Azo paper to be satisfactorily workable while on the printing stage for no longer than this time after which the paper could become affected by stray light.

Image

Basic letter forms were used in my initial experimentation which included still, multiple, overlapping, and moving images. Interesting effects were observed where two images overlapped and a third was produced. Although this was one of my first areas of experimentation, it proved to be the actual procedure used to obtain the final images even though they were to be produced in a different manner on the Staromat circle setter.

A zoom type image was produced by moving the exposure head to various positions while keeping the printing stage and letter in the same position making exposures at each interval of change in the exposure head. The image formed while moving the printing stage during exposure did not produce as satisfactory results as did the two other experiments. The still images produced were interesting, but not unusual to basic design on the Staromat.

Experimentation also included distortion of letter forms through the use of mirrors. This did produce some possibilities for design, but the major disadvantage of these images was that they were so much out of focus at the edges that this became the dominant part of the visual image. I could foresee no way of sharpening these images enough to pursue them further.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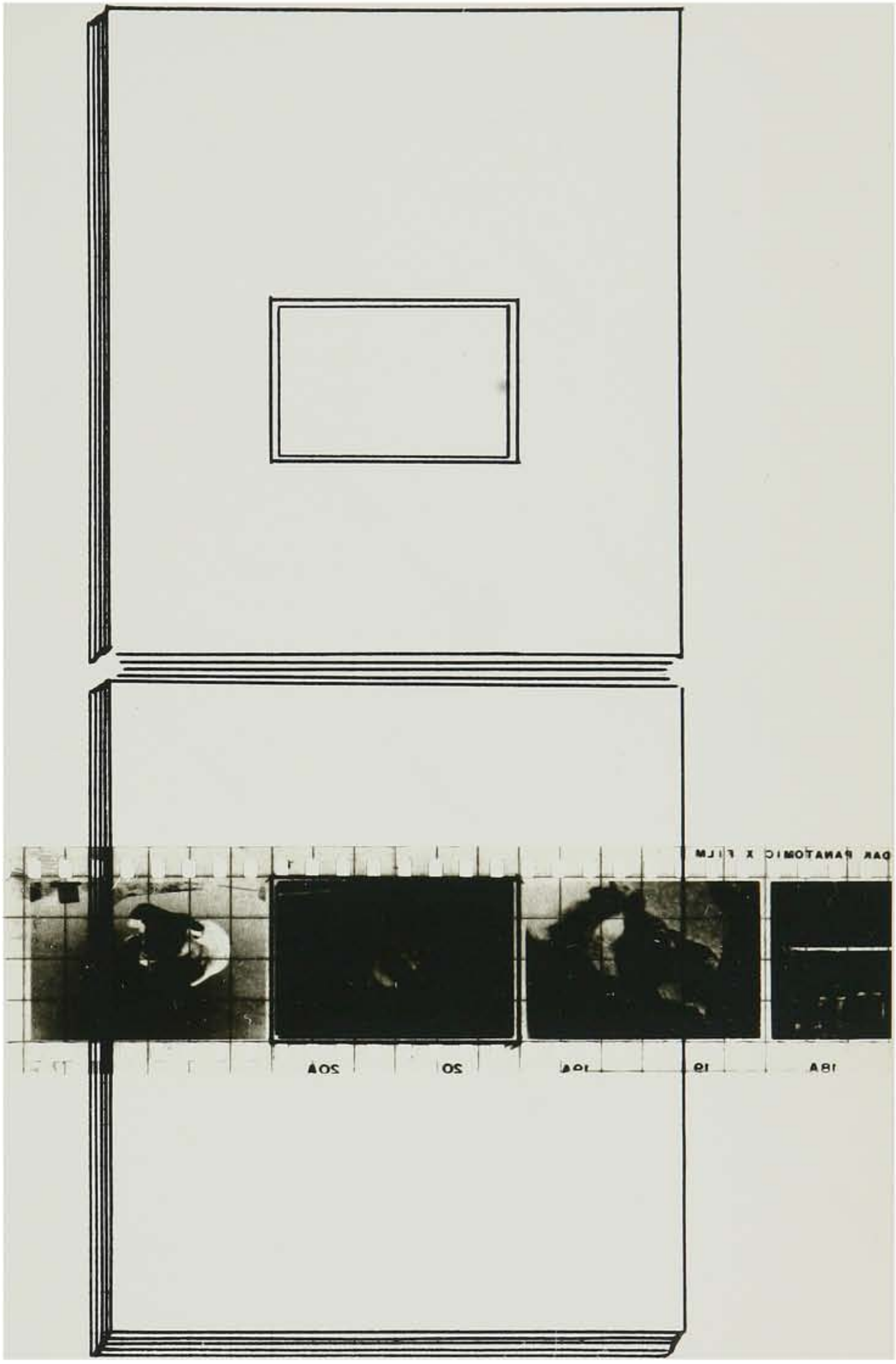
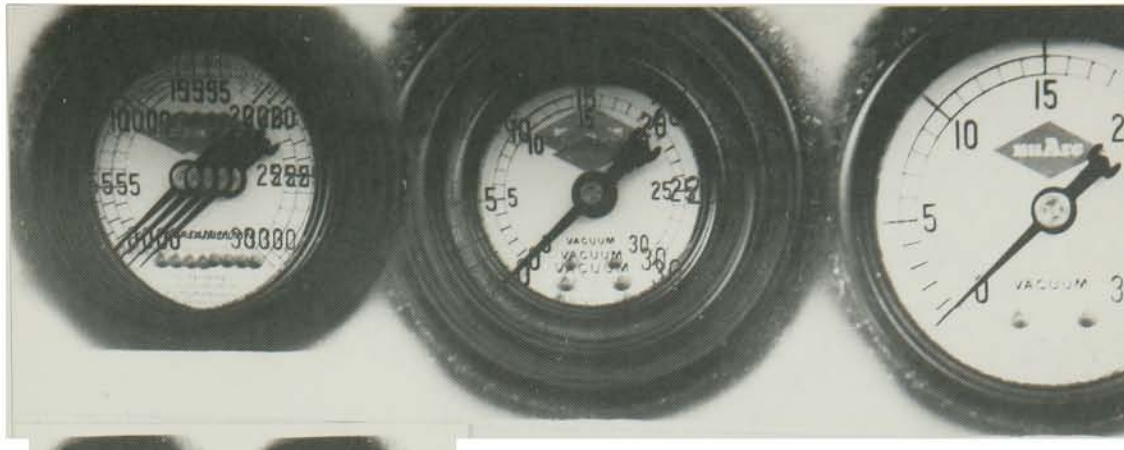
The next area of experimentation was an idea of mine to use an image other than the regular letter or symbol from the Staromat font for projection. As a beginning I inserted a 35mm mounted color slide into the font carrier and positioned it so that the maximum area possible from the slide was projected on to the printing stage. I was able to expose an area of about 20 percent of the slide. Continuing in this respect with the idea of multiple images overprinted and zoom images, I was satisfied with what was developing. Vertical movement of the printing stage at regular even intervals produced promising results.

My next direction was that of figuring a way to project any image that could be normally photographed through the Staromat lens, only increasing the percentage of the negative that could be exposed on the printing over the 35mm slide that I had used. Through the investigative and experimental process, I found that removal of the font carrier and the red filter solenoid cassette gave me the maximum area of use from the lens system.

Building a 35mm negative carrier that fit into the Staromat was the next step. The main concern during its fabrication was to insure that the thickness of the lens carrier would replace exactly that of the font carrier that was removed. Since the area of the 35mm slide that would be projected was approximately 75 percent of the total area of the negative, I had to insure the negative carrier would be adjustable to allow any portion of the negative to be projected through the lens. With the lens carrier and the solenoid cassette removed, the total image projected is always circular using the 35mm negative carrier because the maximum area of the lens is being utilized and there are no framing restrictions. This is due to the fact that the 35mm negative is larger than the area projected.



Using the 35mm negative carrier and negatives that I had taken specifically for this project, I continued to work where I had left off on image experimentation. I did experimentation similar to the last I had worked on with overlapping, multiple, and zoom images. I immediately came upon a technical problem in that I had to manually focus the lens every time I changed the size of the image. This was an inconvenience, but I tried to work around it. Another problem was that in removing the red flag solenoid cassette, I no longer had a red safelight to block the continuous light path when not exposing. I attached a Kodak polycontrast filter holder to the lens and inserted a red filter. As I pushed the exposure button I removed the red filter and reinserted same as soon as the exposure was finished, thereby overcoming the problem.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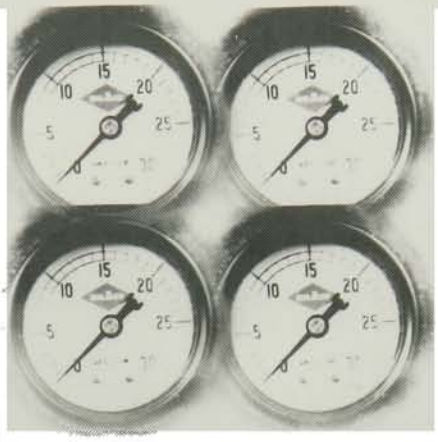
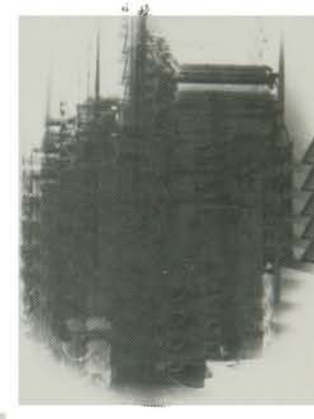
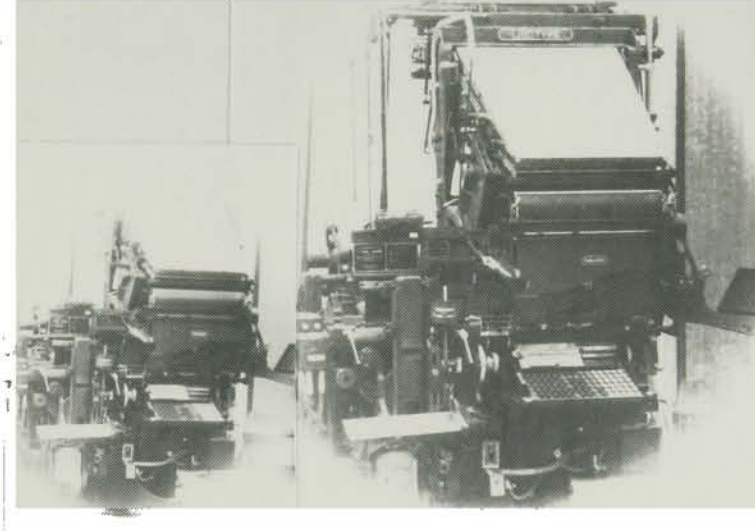


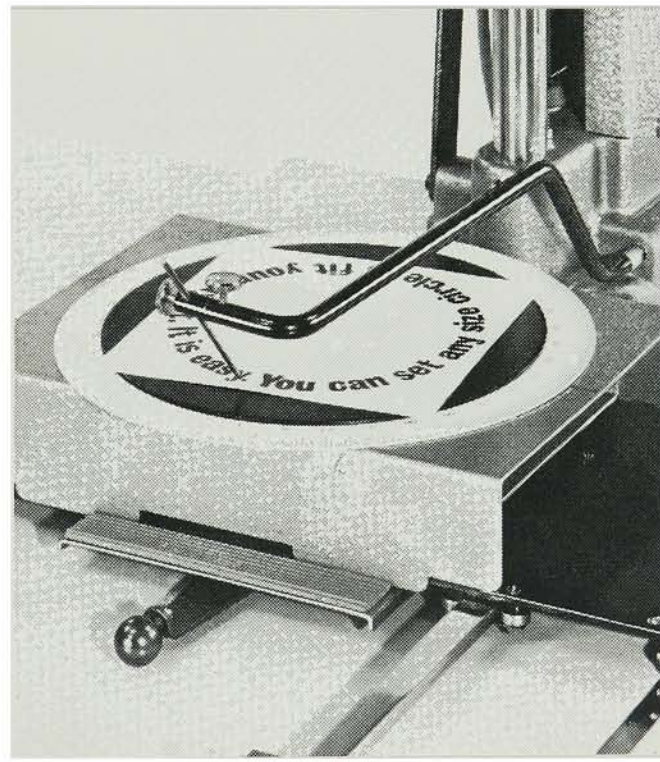




Circle Setting Attachment

At this point I decided to try using the Staromat circle setting attachment. I was impressed with the imagery that was produced using my 35mm negatives with this Staromat accessory.

The circle setting attachment adds another dimension to the Staromat capabilities, in that vertical and horizontal as well as rotational movement are possible between images. The use of all three movements together would allow a spiral image to be formed. There is a degree gauge around the exterior of the circle setting attachment that allows it to be moved an exact number of circular degrees.



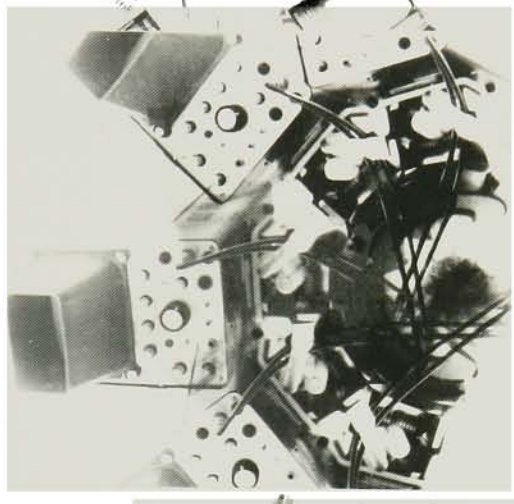
Starting experimentation with the circle setter, I found that the rotational point of the image was important. I started the imagery by making a first exposure with the center of rotation falling within some part of the projected image. Moving the table 60° or 1/6 of the circle, I made a second exposure, partially overlapping the first and rotating about the point within the image. Continuing in this manner, the image was completed after 6 exposures. I experimented with 5, 6, 8, and 10 exposures in forming one image. Ten exposures forming one image seemed to be the most interesting and least suggestive of a specific shape than the others I tried.

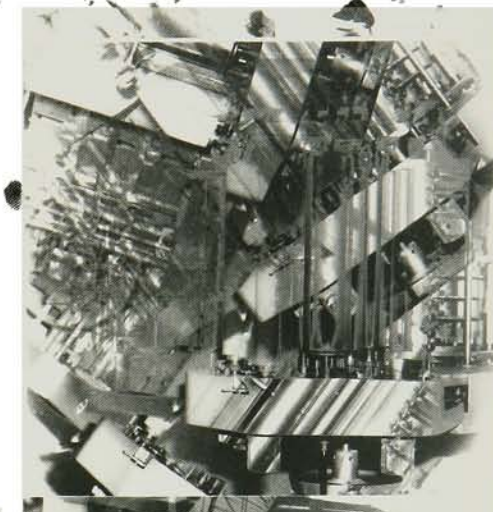
The farther the main or most important part of the projected image was from the center of rotation, the greater the recognition of the subject in the final image.

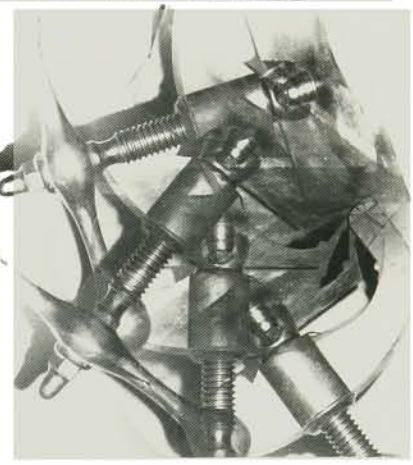
Test images were made in all cases along with experimentation in order to obtain the proper exposure for the multiple image. In most instances it was necessary to decrease the normal exposure time in order to make details more visible in the central areas of the image where there was the most overlapping of exposures. Trying to obtain the greatest contrast and detail was my main objective along with trying to preserve the identity of the original subject.

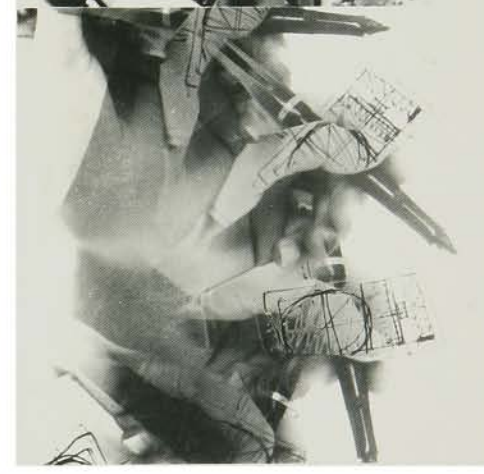
One phenomenon that I noticed in regard to exposure was that as I progressed with the exposures for any one image, each succeeding exposure developed slightly lighter

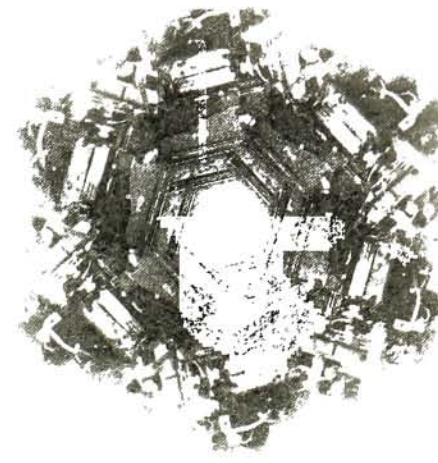
than the previous one. Even when I again predeveloped the paper in the middle of exposing an image, this would still occur. The time for producing each total image was less than a minute, although determining the proper exposure and positioning in preparation for the final printing took considerably longer.

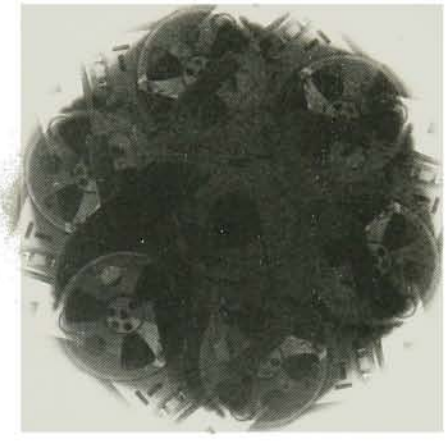


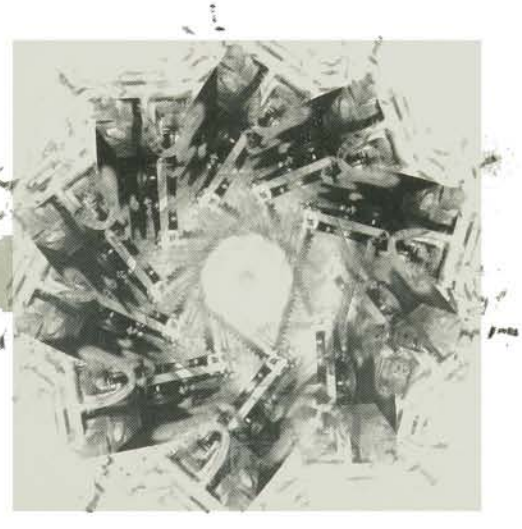


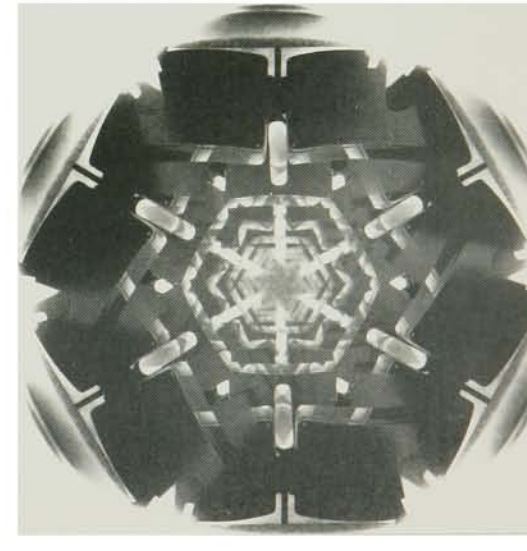


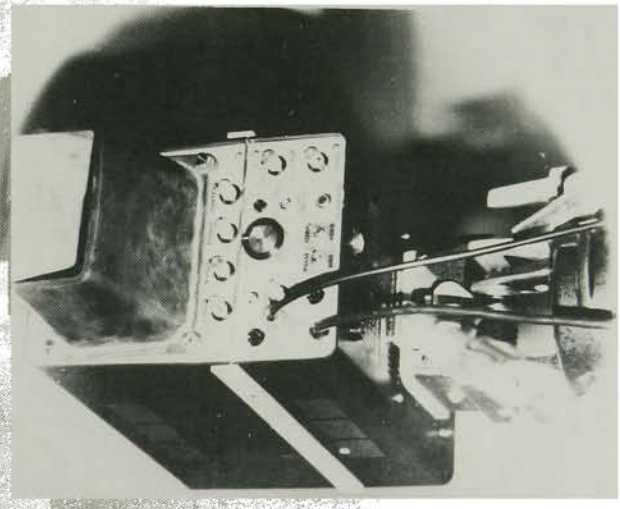


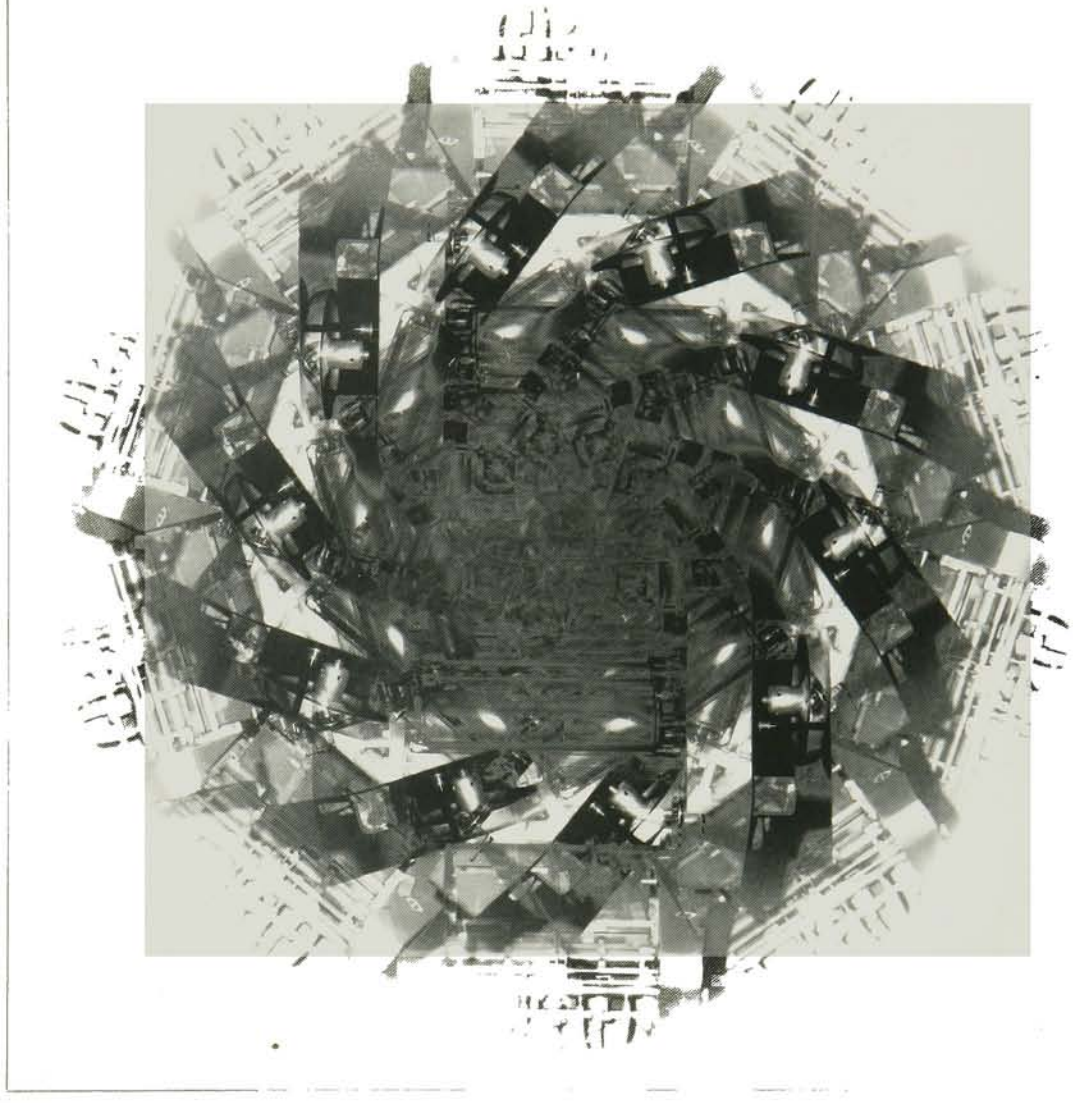


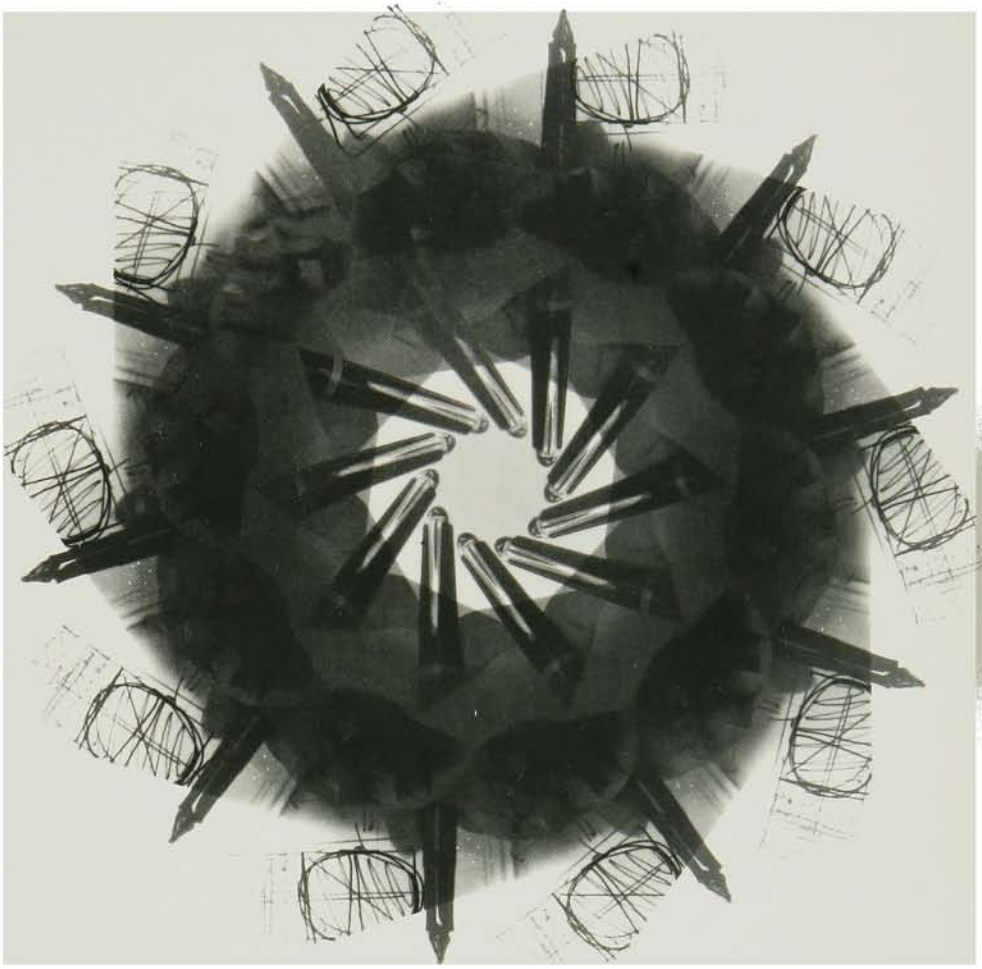


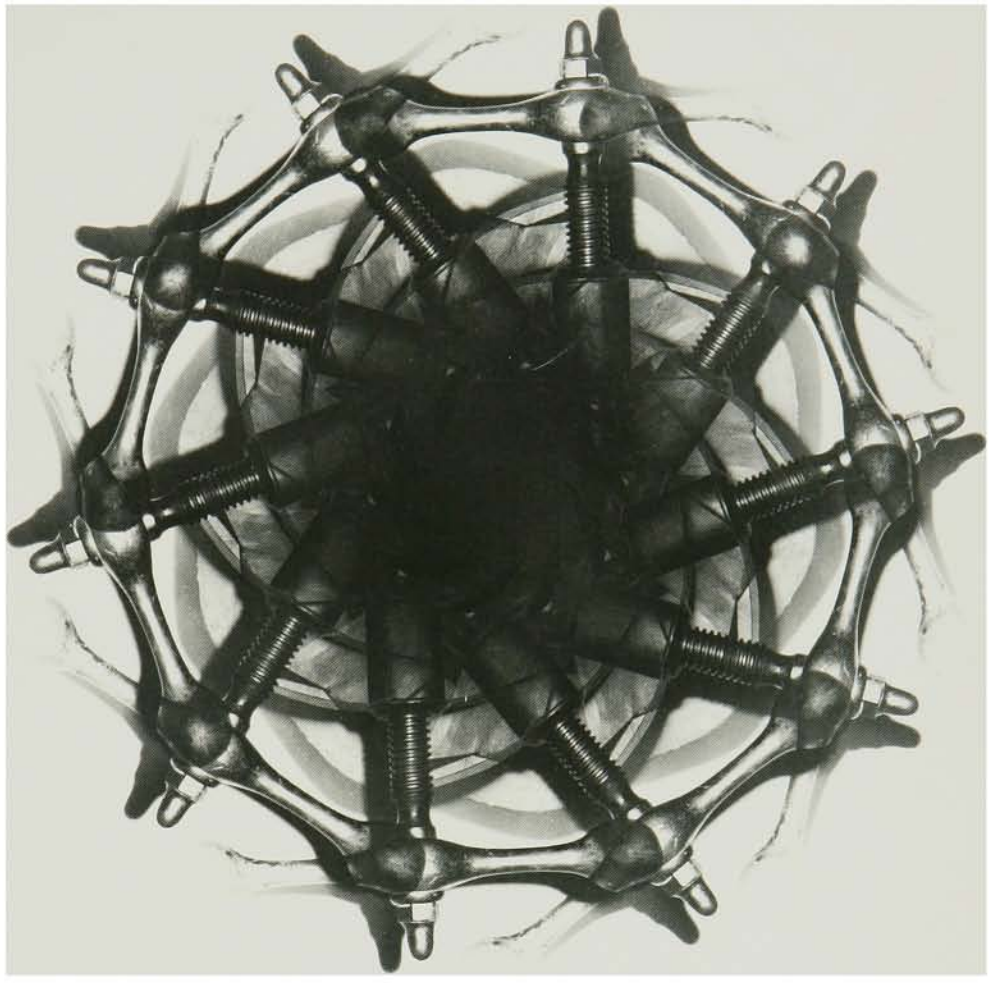


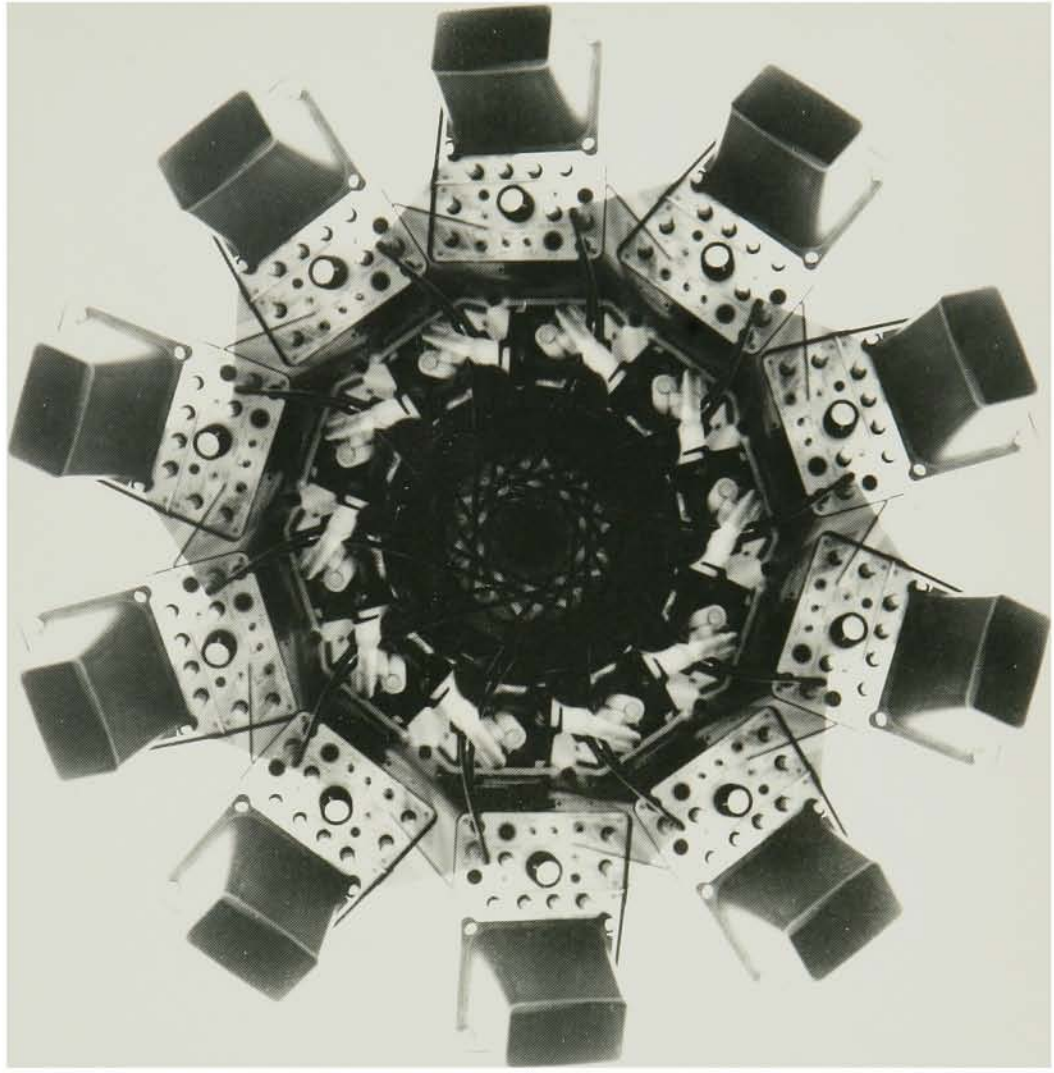


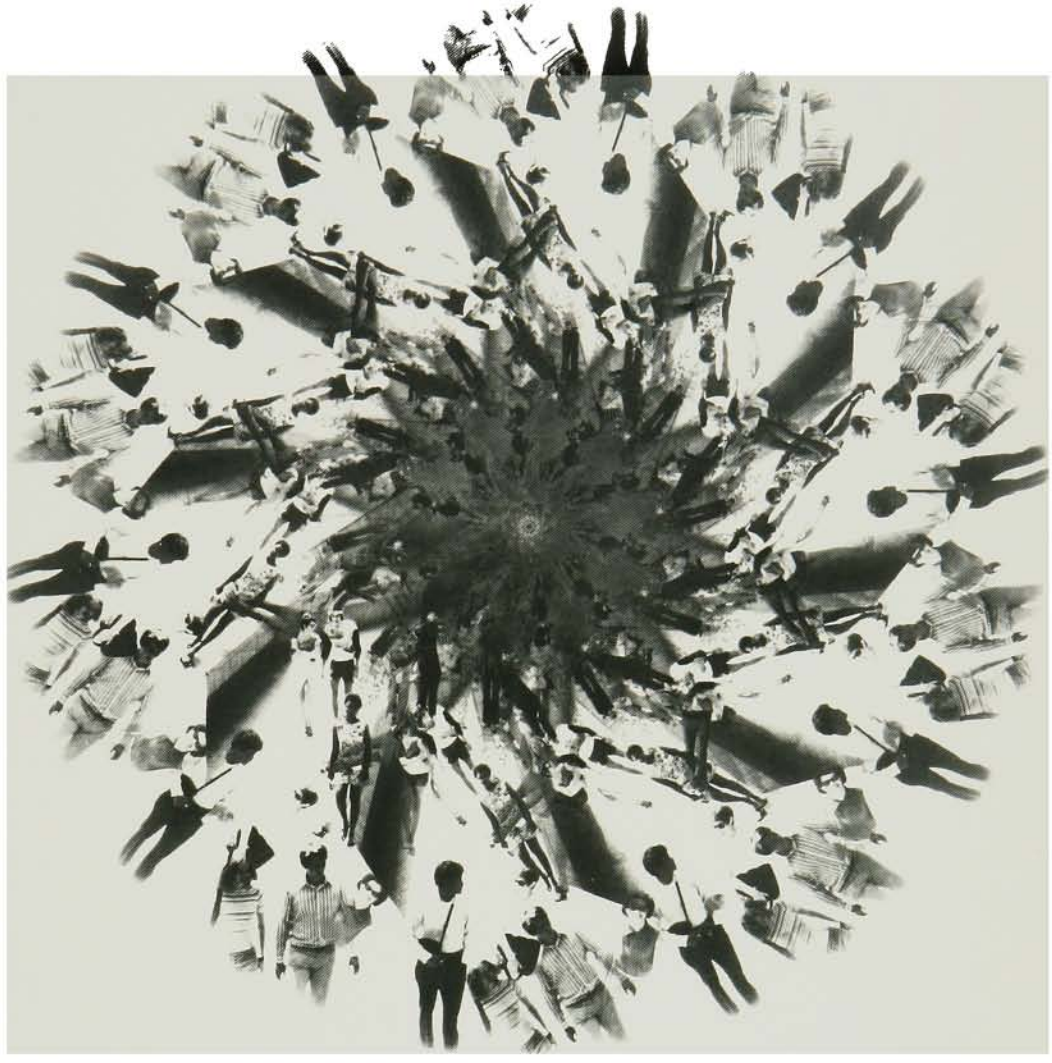












POSTER DESIGN

Concept

The basic ideas for these posters was the promotion of the Communication Design Department of the School of Art & Design at Rochester Institute of Technology.

My central idea was a visualization through designs done on the Staromat of the various facilities available in the Communication Design Department. Based on my experience as a student in the Department and on conversations with Mr. Roger Remington, I arrived at five terms that could be associated with an image and related to design in the Communication Design Department. The five terms were as follows:

TYPOGRAPHICS	Relating to printing facilities
HANDGRAPHICS	Relating to individual conceptual drawing in design
PHOTOGRAPHICS	Relating to cameras, photographic, and reproduction facilities
MOTIONGRAPHICS	Relating to motion picture, video recording facilities
COMMUNIGRAPHICS	Relating to involvement in community projects and communication design

Final decision was made on these terms while I was still in the experimental stage of my Staromat investigation, so rather than one evolving from the other, both concept and image evolved together.

Design

In all phases of the poster design I strived for boldness and simplicity. The folio type of the headings was picked for its clean lines and smooth curves in keeping with the basically circular main image. The logo type was to be subordinate to the total design, but could not be completely subdued. The total design was arrived at by working with each of the parts in final size and arranging them until the proper balance was achieved.

Color was a very strong factor in determining the final design since the paper colors and ink colors were very bold. Colors were chosen so as to make the image dominant and the typography secondary and yet maintain an overall visual balance.

CAMERA

General

It was necessary at every stage of camera work to expose many test strips in order to obtain an image that would contain all the detail and contrast of the original. In some cases this exposure was so far from the norm that much time was spent obtaining only the exposure for that image. Different exposure times were needed for each separate image, since the detail and contrast varied from one image to the next.

The following three sections are a summary of steps taken in order to produce the final type and images.

Image

Set directly on Staromat as a continuous image on F-4 Azo paper 50 percent of final size

Same size photostat made with 133 line eliptical dot half-tone screen

Final size negative image made on ortho film approximately 67 line half-tone screen

Negative image on ortho film contacted to form positive image on ortho film

Positive film image taped in mechanical form on clear acetate and contacted to Ulano Hi-Fi Green

Hi-Fi Green attached to 16xx (and later 12xx) silkscreen

Final image printed from silkscreen

Heading Type

Set directly on Staromat on F-4 Azo paper approximately 150 percent of final size

Photostat to final size (all lines same length regardless of depth)

Negative image made on ortho film

Positive image made by contacting on negative red 3M color key material

Positive image taped in mechanical form on clear acetate and contacted to Ulano Hi-Fi Green

Hi-Fi Green attached to 16xx (and later 12xx) silkscreen

Final image printed from silkscreen

Logo Type

Existing photostat 60 percent of final size

Photostat made 200 percent

Final size negative image made on ortho film

Positive image made by contacting on negative acting red 3M color key material

Positive image taped in mechanical form on clear acetate and contacted to Ulano Hi-Fi Green

Hi-Fi Green attached to 16xx (and later 12xx) silkscreen

Final image printed from silkscreen

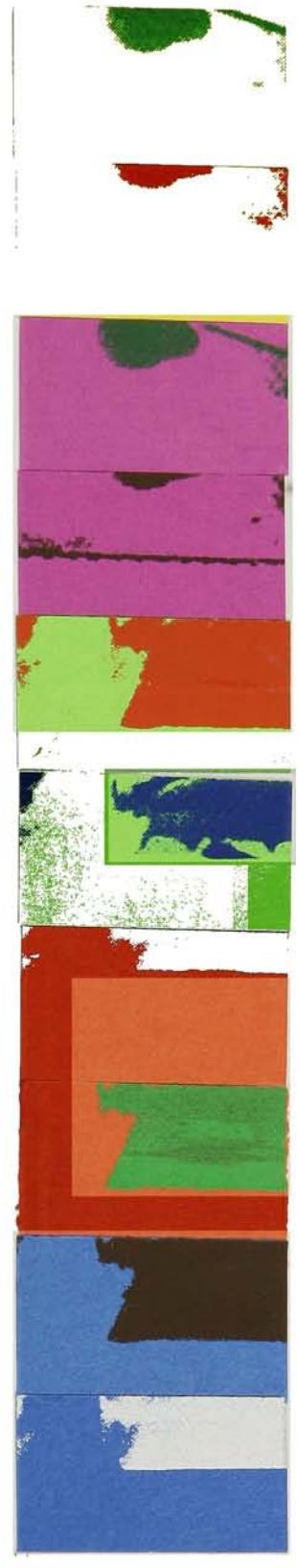
Paper

The paper I chose for the final posters was Mardi Gras Linweave substance 65 cover stock. Colors used were orange, yellow, lime, magenta, and blue. One paper color was used for each image. Final paper size was 16"x22".

Ink

The seven ink colors chosen for production were Advance Silkscreen Inks mixed with 15 to 30 percent Advance Opaque Extender. Two colors were used on each paper color, one for the main image, and the second for the typography. Color distribution was as follows:

Ink	Paper	
	Typography	Image
Earth Brown	Blue	Magenta
Opaque White	Orange	Blue
Ultra Orange	Green	Yellow
Holiday Green	Yellow	
Medium Chrome Green	Magenta	
Cerise		Orange
Ultra Blue		Green



Printing

All images were originally put on 16xx mesh silk-screens with Ulano Hi-Fi Green. It was hoped that the fineness of a 16xx screen would provide more points for adhesion of the very fine dot pattern produced in half tone in the center of all the images.

Test images were made on the 16xx mesh screens and I found that they did not reproduce the finer parts of the image even though these fine dots could be seen in the Hi-Fi Green adhering to the screen. The problem was not so much that of the image filling in the screen as it was what seemed to be the ink flowing around the dots and printing a more solid area on the paper.

Test images were done on 12xx mesh screens with varying Hi-Fi Green exposures, varying squeege pressure and various ink to extender mixtures as well as different types of inks. The normal Hi-Fi Green exposure was $2\frac{1}{2}$ minutes under the arc lamp used but experimentation showed a slight improvement in my specific images with a $3\frac{1}{4}$ minute exposure. The latter time was used to make the final screens. Experiments with enamel ink, special half tone ink, and regular silkscreen ink along with all extremes of ink to extender mixtures helped determine the best combination used in the final prints. The 12xx mesh screens proved slightly better holding the image when combined with the best ink to extender ratio and squeege pressure. Therefore all images were again applied to silk, only this time on 12xx mesh screens.

The actual printing was done in two runs for each poster, one for each color, with both areas of type on each poster run at the same time.

Although in test runs an acceptable image as far as detail is concerned was printed, it was impractical or impossible to get this detail in the final prints. The frequency with which the screens needed to be cleaned between prints was prohibitive. In actual printing, the small typography required cleaning every 5 to 6 prints and the main image began to deteriorate noticeably after the first print. For this reason I was very much disappointed in the detail of the final image as compared to the original continuous tone image.

Some observations I made regarding the silkscreen printing were directly relative to the quality of the print. It was found that there is a relation between squeege pressure and the particular ink consistency. Some ink colors required more pressure than others; some were more liquid than others, and one would dry in the screen sooner than the other--even though all were mixed with the same percentage of extender.

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