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Exposure adjustments for halftone reproductions using the Polaroid MP-4 system

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Abstract

Establishment of exposure procedures for producing medium contrast halftone reproductions of varying contrast original material, utilizing the Polaroid system MP-4 copy camera.

EXPOSURE ADJUSTMENTS FOR HALFTONE REPRODUCTIONS USING THE POLAROID MP-4 SYSTEM

A Graduate Project

Submitted to the

Division of Educational Media,
Department of Curriculum and Instruction

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Master of Arts in Education

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by

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This Graduate Project by: Elaine L. Rasmussen

Entitled: Exposure Adjustments for Halftone Reproductions using the Polaroid MP-4 System

has been approved as meeting the graduate project requirement for the Degree of Master of Arts in Education.

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Date Approved

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GRADUATE PROJECT IN THE AREA OF GRAPHIC PRODUCTION:

Establishment of exposure procedures for producing medium contrast halftone reproductions of varying contrast original material, utilizing the Polaroid system MP-4 copy camera.

Equipment utilized:

Camera: Polaroid system MP-4 copy camera with sliding head assembly
Film holder: Polaroid 4x5 Land film holder #545
Halftone screen: 100-line glass halftone screen
Viewing system: Model 44-55 reflex viewer and hood
Focusing system: Model 44-54 ground glass focusing system

Conditions:

The camera used was mounted upon the Model XLR baseboard with the Polaroid XL lighting assembly attached. The camera was located in the studio in the Graphics Laboratory with absolute control of ambient light and lighting conditions.

Technique:

In order to achieve a satisfactory level of contrast in a halftone reproduction it is necessary to balance the relationship between the intensity of the white dots and the black dots. This is accomplished by a second exposure of the negative utilizing a bump or flash technique; that is, exposing the negative for a short period to white light either before or after the main exposure has taken place. The length of this exposure is determined by the contrast qualities of the original material which is being reproduced.

Procedures:

Utilizing an original photograph a continuous tone reproduction was made on three different contrast graded papers to obtain a high-contrast

copy, a medium-contrast copy, and a low-contrast copy. The paper used was Ilford brand, Ilfobrom IB4.1P in contrast grades 5 for high contrast, 3 for medium contrast and 0 for low contrast effects.

Each of these original photographs was then reproduced as a 100-line halftone using the MP-4 copy camera. Exposure times were initially based upon the standard exposure guide provided with the camera for the production of halftones. Variations in both the MAIN and FLASH exposures were experimented with within each contrast range to obtain the most uniform results in terms of an acceptable medium contrast halftone reproduction as the final product.

The film utilized for these reproductions was Polaroid Type 51/High Contrast as recommended by the camera manufacturer. The lighting set-up and camera equipment were those included in the assembly of the camera owned by the Graphics Laboratory at the University of Northern Iowa Media Department. This equipment and all aperture settings, film and other materials used in this project were held constant throughout the procedures. In all instances the second exposure was a FLASH exposure, immediately following the MAIN exposure, using a white matte card as the light reflector. The only variable employed in the reproduction of the halftones was the length of the exposure times.

Evaluation criteria:

The key to a good halftone is the dot structure. No area of the print whould be clear white or solid black without dots. The highlight area should be filled with small black dots, and clean white dots should be present even in the deepest shadow areas. All dots should be crisp and sharp, and should not have gray edges.

Observations:

1. To correct the situation in which the black dot in the highlight area is too small, shorten the length of the MAIN exposure.
2. To correct the situation in which the black dot in the highlight area is too large, extend the length of the MAIN exposure.

3. To correct the situation in which the white dot in the shadow area is too large, shorten the length of the FLASH exposure.

4. To correct the situation in which the white dot in the shadow area is too small, extend the length of the FLASH exposure.

Additional Observation:

To produce a halftone reproduction of greatest detail and clarity the best results may be obtained from an original that is on the lower end of the contrast scale; i.e. a low-contrast original will produce a more effective halftone reproduction than will a medium or high-contrast original.

Proposed utilization of observations:

Examples of each observed result and its modifications will be mounted in a chart format and posted in the area that the Polaroid system MP-4 camera will be used in a laboratory situation by students. These examples will then be used as a reference for exposure times in the operation of the camera.

Statement of personal objectives:

My personal motivations for undertaking this project were primarily those of obtaining increased knowledge about the photographic aspects of graphic productions in general; and learning more about the process of obtaining good halftone reproductions and the functions of the Polaroid MP-4 camera specifically.

Photographic processes are of primary importance in graphic production and I felt that the stronger knowledge base I could obtain in this area, the more viable a producer of instructional materials I could become.

Personal evaluation:

I feel that the objectives stated above were met by this experience. I particularly feel more competant in the area of producing and evaluating halftone reproductions of merit that will enable the final instructional media to be of the highest possible quality.

I enjoyed working with the sophisticated camera equipment found in the Polaroid system, but feel that I can easily transfer the benefit gained from this project to any other situation I may find myself in.