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6 December 1966

COLOR FILM/PRINT DRYER STUDY -- STAFF STUDY
#10047

1. PROBLEM

To improve the NPIC capability in reproducing color photography by increasing the ability to handle cut sheet color materials.

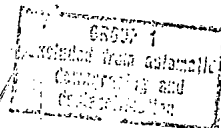
2. FACTS BEARING ON THE PROBLEM

- a. The two new automatic color processing machines in NPIC/PSD can yield increased production. These machines do not include any drying system.
- b. On every mission, NPIC prepares color viewgraphs showing the flight path of the mission. Normally, more than 50 viewgraphs each of several tracks are prepared for each mission.
- c. The automatic color processing equipment in NPIC/PSD can process sheet film or color paper at the rate of 200 8" x 10" sheets or equivalent each hour.
- d. The dryer cabinets for film, which can handle about 60 sheets per hour, cannot handle the output of automatic color processing equipment.
- e. There are no high quality, rapid color film or color paper dryers commercially available that will solve the drying requirement of the color sheet material produced in NPIC.

3. DISCUSSIONa. Current Procedure

(1) Cut sheet color films are presently dried in a drying chamber or cabinet. The films are usually placed in film hangers in the drying cabinet and hot air is circulated around the film. This method is time consuming and does not dry the film in a quality fashion, that is, the film is not dried so that there is no evidence of watermarks, abrasions, scratches, image distortion, peeling, curl, fading, color shifts, mottling, etc.

(2) Glossy color prints are dried in much the same way as glossy black and white prints. During the drying process, the emulsion is kept in contact with a highly polished chromed surface, usually a drum. The gelatin of the emulsion forms to the surface

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of the chromed plate or drum, leaving the print with a high gloss finish. The drying process for glossing color prints, using commercial black and white dryers, is very critical. The temperature and speed of the dryer have to be kept within close tolerances. The output is limited because the dryers must use a slower speed for color print materials.

(3) There are no commercial print dryers that can rapidly dry color prints matte, in a quality manner. The most accepted method uses hot air drying racks. The prints are placed face up on a saran mesh shelf in the rack, where hot air is circulated around them. This process takes at least 20 minutes and leaves curled and wavy prints, which then have to be flattened in a dry mounting press. During the flattening process there is danger of cracking the emulsion.

(4) Another method of drying prints matte is allowing them to air dry without applying heat. This method usually prevents severe curling but requires several hours of drying time.

b. Origin of Concept

The need for advanced color film and paper dryers has been recognized for several years. The requirement was formalized in a recommendation from the NPIC Technical Development Staff in July 1966. The need for improved color film dryers has also been recognized by the Photo Lab of the Production Services Division of NPIC.

c. Selection of Contractor

NPIC has solicited nine industrial corporations to bid on a Color Film/Print dryer study. Five have submitted proposals. Of the five, the proposal from [redacted] illustrates a thorough understanding of the requirements as outlined in the development objectives.

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d. Proposed Program

[redacted] proposes an eight-month program to investigate advanced techniques for drying photographic color prints and color sheet films. The most promising drying techniques will be investigated, and upon NPIC approval, the most feasible approaches will be breadboarded. The breadboards will demonstrate the recommended techniques and result in design parameters for an advanced color film and paper dryer or dryers.

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e. Program Phasing

The contractor will submit monthly reports on expenditures, work performed, and results obtained. After five months, the

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contractor will present recommended drying techniques, and upon concurrence of NPIC personnel, breadboard hardware will be constructed to demonstrate the most promising techniques. From these breadboard demonstrations the contractor will formulate, in the final report, design parameters for an optimized color sheet material dryer or dryers.

f. Coordination

This project has been coordinated with DDS&T/ORD. Members of the Community have received advance narrative description of the Project through the Committee on Photographic Exploitation (COPE).

g. Alternatives

An alternative to the study program would be to solicit bids for hardware development. This method would probably result in acquiring equipment that may not use the most efficient technique in color material drying.

4. CONCLUSIONS

The new color processing machines in NPIC have increased the capability to produce color sheet prints or transparencies. Rapid dryers using advanced techniques are needed to accommodate the production from the two Color Auto-mat Processors.

[redacted] past experience in the area of film technology and photo-processing techniques well qualifies them to perform the study.

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5. RECOMMENDATION

It is recommended that approval be granted to contract with [redacted] at a funding level of \$67,313 for a Color Film/Print Dryer Study.

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6. REFERENCES AND ATTACHMENTS

Tab A. Catalog Form

Tab B. Development Objectives (2)

Tab C. Program Phasing

Attachment: [redacted] Proposal

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