CONFIDENTIAL

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25X1A

[redacted]
Ft. Davis Station
Washington, D. C. 20020

25X1A

Attention: [redacted]

25X1A

Subject: Monthly Status Report [redacted]

Gentlemen:

Enclosed herewith you will find five (5) copies of the second monthly status report under subject contract.

Very truly yours,

CONTROL DIVISION

[redacted] 25X1A
Contract Administration
and Federal Taxes

25X1A

WA:sm

Enclosures: As Listed

Declass Review by NIMA / DoD

CONFIDENTIAL

[redacted] STATINTL

Second Monthly Letter Report

OPEN GATE STUDY

PERIOD: 28 May - 29 June 1964

[redacted] STATINTL

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LIST OF ILLUSTRATIONS

I. PURPOSE OF STUDY

The objective of this study is to determine the feasibility of a continuous film-to-film contact printer that uses open-gate techniques and has an output performance compatible with current state-of-the-art. Known factors contributing to degradation of image quality in the system are to be analyzed.

Specific attention will be paid to the problems of assuring film contact in the printer gate, as well as possible advantages of using "liquid gate" techniques in the system. Also techniques for film cleaning will be evaluated. The study will be summarized in a test plan, which defines a program to evaluate experimentally the most promising approaches.

II. ACTIVITY OF THIS REPORTING PERIOD

A. EXPERIMENTAL PROGRAM

Experiments were performed to evaluate the effects of contacting pressure, intermediate liquids, and diffusion in the illuminating system on output resolution.

In order to perform the test, a 45.5X photoreduction of a USAF 1951 test target, on Eastman SO 105 emulsion, was used. The visual resolution threshold was 650 lpm with a microdensitometer contrast (ΔD) of 0.02, measured with an effective slit width of 0.3 micron.

This target was then sequentially contact printed nine times through an Eastman 649-GH intermediate to produce an Eastman SO-132 9-target-array submaster. Final visual resolution in the submaster ranged from 230 to 290 lpm. Microdensitometer cont. ranged from 0.10 to 0.18 at the limiting resolution.

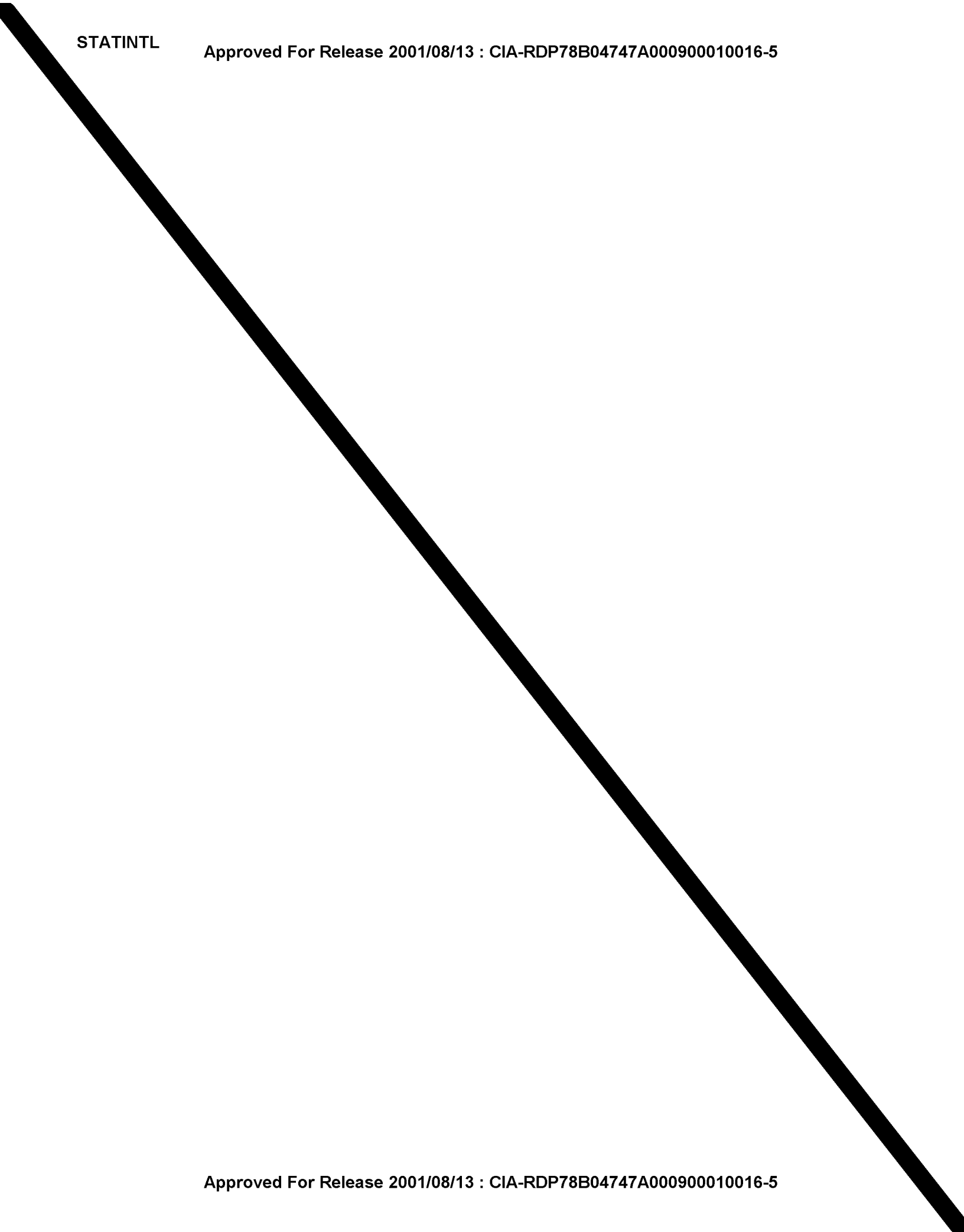
The submaster was contact printed onto Eastman SO-278 (Type 8430) in the test setup shown in Fig. 1 under varying conditions of contact pressure, liquid gate, and source diffusion. These conditions are given below.

Pressure: 0, 0.33, 2.12 psi.

Liquid Gate: 90% Toluene, 10% "Freon-113" between submaster and film.

Diffusion: ground glass, optionally inserted.

The experiments were randomly reproduced to minimize systematic errors, and output resolution was determined visually by two readers. The results are summarized in Fig. 2.



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B. TECHNIQUE EVALUATION

We have surveyed conventional techniques broadly using published information, manufacturers' literature, patent data, and direct survey of photographic processors in the field.

We have considered the following techniques for obtaining contact pressure:

1. Vacuum.
2. Air bearing.
3. Electrostatic attraction.
4. Adhesive and liquid gates.
5. Magneforming.
6. Hydraulic pressure.
7. Centrifugal force.

We have considered the following techniques for dirt elimination:

1. Air knife.
2. Vacuum.
3. Ultrasonics.
4. Electrostatics.
5. Solvent wash.

In the liquid-gate study, we are considering the following problems:

1. Material compatibility.
2. Methods of application.
3. Methods of removal.

III. PLANS FOR NEXT PERIOD

We plan to complete our evaluation and prepare a draft of the test plan to be submitted on this program.