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Approved For Release 2004/08/25 : CIA-RDP76B04770A000600010012-3

25X1

May 26, 1965

25X1
[Redacted]
P. O. Box 6788
Fort Davis Station
Washington, D. C. 20020

25X1
Subject: Proposal for a Study and Experimental Investigation
of Electrophotographic Techniques
[Redacted]

Dear Sir:

25X1
In confirmation of discussions held with your technical people on 21 May 65 we are submitting herewith additional technical information which will serve as clarification of the subject proposal which was submitted to you with our letter of 25 March 65. The first document is an expansion of the work statement as set forth in the original proposal and the second document is a technical discussion of Imagery Aspects of the Electrophotographic Process. These two additional documents, together with the original submission, and the information contained in this letter, constitute the entire [Redacted] proposal.

During the recent discussions, additional information on certain aspects of the proposal were requested by your technical people. This information is set forth below.

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The following is an estimate of the signal-to-noise ratio performance of the electronic processing as described in Section III of [Redacted]

Neglecting film granularity, for the moment, and assuming a density range of 2.0 on the film to be copied, 36db or greater peak-to-peak signal to rms noise ratio can be expected. Now consider SO132 film having a granularity of 0.023 (as measured by a

NGA Review Complete

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24 micron uniformly illuminated aperture) being scanned by a 2 micron gaussian spot. The resulting S/N will be about 20db. This is the signal input to the processing amplifiers. A portion of the proposed processing involves threshold limiting of the signal and conversion to clipped pulse form. By this device, low amplitude noise will not be amplified but useful signal will be. Some high amplitude noise will be exaggerated. Whether increased signal, at high spatial frequencies, resulting on the modified copy will outweigh the increased noise is not certain without experimental trial. Low frequency components, when viewed at low power magnification, should be expected to have a S/N not significantly different from a conventional copy.

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With regard to the frequency analyzer, Section IV of [] and a S/N of about 15 db is expected. It is possible that this figure might be increased by integration techniques, in a manner analogous to the improvement which may be obtained by multiple recording of superimposed oscilloscope traces of a noisy repetitive transient signal.

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Knowledge obtained in the construction and operation of the breadboard electronic film reproducer, and of the modulated light source for the electrophotographic techniques study, Section II of [] should provide a sound basis for development of a high speed, high resolution automatic dodging printer. With present knowledge it appears that, using contact printing (and we have made contact prints with limiting resolution well beyond 400 cycles per millimeter), and with the expectation of a solution to the problem of operation without an anti-halation backing, such a printer can be developed which will provide a capability of better than 200 cycles per millimeter, a printing speed of 40cm²/sec, and automatic dodging at spatial frequencies up to 10 cycles per millimeter.

The light box required in the electrophotographic technique study was also discussed with your people and it appears as though it may be possible to furnish this to [] as GFE. Should this not be the case, we would anticipate that the Government would allow this expense against the contract.

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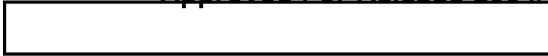
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Should additional information be required please contact the undersigned at area code 

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Very truly yours,

Original Signed By



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JCM:esc

Marketing Representative

Enclosures:

Work Statement Modification (4 copies)

Copy No. 7 through 10

Dated 20 May 65

A Discussion of Some Imagery

Aspects of the Electrophotographic

Process Dated 20 May 65 (4 copies)

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23 April 1965

STUDY OF TECHNIQUES FOR IMPROVING IMAGE PERCEPTIBILITY

Some Specific Questions to be answered:

1. Can degraded recorded images be restored? (by "degraded image" is meant an image with any individual properties other than those exhibited by the original object)

a. By what means?

- (1) theoretical
- (2) practical

b. To what degree?

- (1) of sensitivity
- (2) of resolution

2. What modification in image appearance improves perceptibility?

a. Without retraining the observer.

b. With retraining the observer.

3. What are the limitations of image modulating processes with respect to MTF and S/N ratio?

a. theoretical

b. practical

- (1) High-speed, high-performance, roll film contact printer.

4. What are the differences in the processing requirements for static and dynamic viewing?