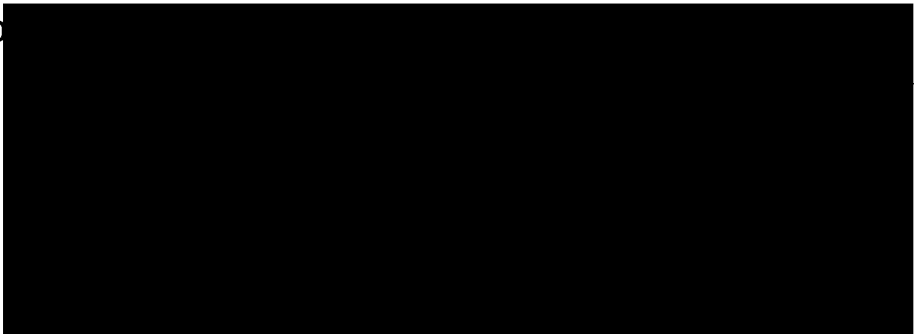


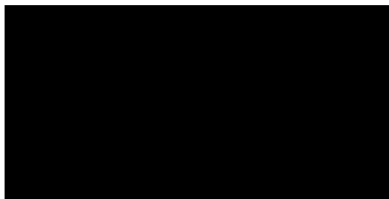
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13 November 1962

Please Reference:
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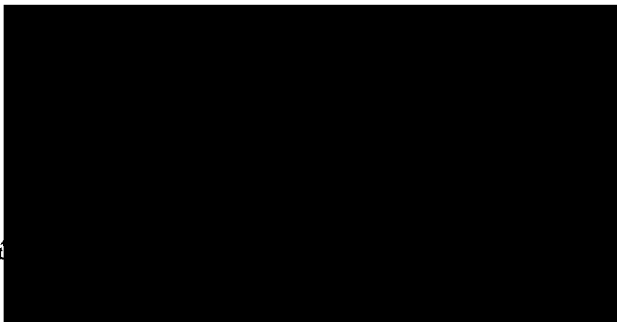
Dear



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Enclosed you will find three copies of the 23rd Monthly Progress Report on Contract  Task Order No. 1, for the development of an Image Enhancement Instrument.

Very truly yours ,



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Enclosures-3

Declass Review, NIMA/DoD

23rd MONTHLY PROGRESS REPORT

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Image Enhancement Program

Contract [REDACTED] Task Order No. 1

4 October to 4 November, 1962

During the month of October, the following tasks were accomplished:

1. The light regulating feedback loop was assembled, in breadboard form, and applied to the system.
2. Improvements were made in the modulated light source electrical system; the utilization of better voltage regulation for the CRT improved the stability of the light spot with regard to image motion at the spot mask.
3. The moving spot mechanical system for the modulated light source was modified to permit more accurate and careful adjustment.
4. The CRT utilized in the modulated light source proved defective, and was replaced with a new unit.

Numerous tests were performed in an attempt to produce an output image of constant intensity, free of banding and streaking. These tests suggested a rearrangement of the positioning of the optical pickup for the light regulating feedback loop, and other adjustments and refinements, but success has not been achieved. The exact nature of the reasons that the output image is not satisfactory is still undetermined.

Following these disappointing results, the decision has been made to utilize a high resolution cathode ray tube for the output image, utilizing conventional raster deflection of the tube to produce the format, and a camera to photograph the face of the tube.

This approach is not potentially as superior as that using the rocking mirror for the output scan, nor is it amenable to the packaging of the overall system. However, it will permit output images to be obtained, of sufficient quality to permit an assessment of the enhancement techniques that have been incorporated in the laboratory system.

It is planned that this new approach will be in operation during the latter part of November.

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24th MONTHLY PROGRESS REPORT

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Image Enhancement Instrument

Contract [REDACTED] Task Order No. 1

4 November to 1 December, 1962

This report, in addition to the usual enumeration of accomplishments of the reporting period, is intended to summarize the status of the project and the recommended plan of action for the remainder of the program. Attached to this report is a summary of current financial status, together with our estimate of the costs expected to be incurred during the completion of the project along the lines described below.

During November, the cathode ray tube output image display was incorporated in the laboratory setup and placed in operation, utilizing laboratory instrumentation and components borrowed from other projects in order to expedite its early reduction to practice. The quality of the output raster is very much improved, and, within the resolution limits imposed by the cathode ray tube, it now appears that this approach will be useful in demonstrating the performance capability of the enhancement instrument. The present arrangement utilizes a 5 CEP 15 cathode ray tube with 0.002 inch diameter spot, with the recording accomplished by means of a Polaroid oscilloscope camera. Results are of sufficient quality to warrant the refinement of this system to further improve the resolution, raster uniformity, and gray scale rendition.

It is recommended that these refinements be accomplished, the necessary subassemblies be constructed, and the component equipment currently spread about

~~the laboratory be installed in the console, and delivered in satisfaction of the contractual requirements under the program.~~ These steps are described in more detail below. This recommended approach to the completion of the program will result in delivery to the Government of an experimental image enhancement device which will serve as a valuable research tool in assessment of the various enhancement techniques which are incorporated in the instrument. In particular, this equipment will contain the only known embodiment of area scan filtering. As an experimental tool, its most valuable use may be in the formulation of requirements and design techniques which may be used for future efforts relating to image enhancement instrumentation. The final instrument to be delivered under this project will incorporate the cathode ray tube output display, and a camera for the recording of positive prints or transparencies of the enhanced image. The cathode ray tube and associated circuitry will be attached to the console in the space formerly reserved for the projector.

The proposed program for completion of this project is divided into three parts, as described below:

Phase A - Continuation of the laboratory experimentation and circuit development work. This phase will be completed by 11 Jan 1963. During this time the gray scale rendition of the present cathode ray tube will be investigated, and the ~~new~~ necessary compensation circuits constructed and incorporated in the system. Better deflection voltage generators will be developed to replace the current mechanically driven function generator borrowed from another project. Noise and pick up of stray signals will be reduced by incorporation of better filtering and shielding, as required. Continual testing and evaluation will be undertaken to check the designs as they are developed.

Phase B - Packaging for Delivery. Completion of this phase is estimated on 28 February 1963. During this phase, the circuits will be constructed in final form and all elements of the laboratory setup inserted in the console. This task will require some re-working of the console in order to accommodate the different approach, the usual amount of cutting and fitting, and the wiring together of the various parts of the system. It will be necessary to purchase the following items: High resolution cathode ray tube, deflection yokes, cathode ray tube shield, deflection circuit power transistors, oscilloscope (or other) camera with Polaroid back, focus anode power supply, and miscellaneous electronic parts for the waveform generators and other portions of the system which may require modification. Because of the extensive testing required, there is always the danger of breakdown of a key element of the system, introducing additional delay and expense pursuant to its correction.

Phase C - Preparation of documentation (Operations Manual and Final Engineering Report)

Completion of this phase is estimated on 30 March 1963. Inasmuch as the documentation of the achievements on this program may be of importance equal to the equipment itself, it is recommended that the final engineering report be prepared substantially as planned, i.e., complete in every detail which may prove of value to future efforts. The operations manual, however, may be abbreviated to contain only those items necessary to the correct operation of the instrument to be delivered. A study of both documents, by whoever is to operate the instrument, should achieve the same goal as the more extensive operations manual which was originally contemplated.

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The efforts and expenditures necessary to the completion of these phases are outlined in the attachment to this report.