

THE EFFECTS OF PHOTOGRAPHIC  
GROUND RESOLUTION ON PHOTOINTERPRETATION

Progress Report No. 2, 19 November 1969

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The proposal to conduct the work under this contract was submitted on 18 April 1969. The proposal was entitled, "Proposal to Conduct Additional Research on the Effects of Photographic Ground Resolution on Photointerpretation." The proposal, which was incorporated in the contract, contains the following statements:

"...it is proposed that two studies be done in the following two phases:

*Phase I:*

- Ia. A study of the effects of ground resolution on the interpretation of military vehicles using scale models as targets (the 'model' study).
- 1b. The preparation of materials for a study of the effects of ground resolution on the interpretation of ground forces, using real ground force equipment and personnel as targets (the 'field' study).

*Phase II:*

Execution of the 'field' study. This proposal is to conduct Phase I only."

Phase Ia, the "model" study, was actually in progress at the time the 18 April 1969 proposal to conduct additional research was submitted. The work was being done under Contract [REDACTED] We expected that the funds to conduct the additional proposed research would simply be added to the existing contract so the "model" study was

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included in the work statement to establish the continuity of the work.

Thus far we have:

1. *Completed the "model" study.* A draft of the technical report, "A Comparison of Line-Scan and Photographic Images for Target Identification," was delivered to the sponsor on 28 October and two briefings on the results of the study were given in Washington on the same day. A critique of the draft of the report was obtained from the technical monitor and the final version of the report is currently being prepared.

The results of the study showed the effects on target-identification performance of photographic ground resolution, and the effects on such performance of line-scan image signal-to-noise ratio and number-of-scans per target. The study was the first known attempt to relate line-scan and photographic images in terms of photointerpreter performance. Although models were used as targets rather than real vehicles, the data are undoubtedly useful and indicate clearly the importance of continuing the work.

2. *Gathered high resolution photography over Aberdeen Proving Ground.* The photography contains a large number of ground-order-of-battle targets, tanks, and artillery pieces. It also contains test targets and other objects--triangles, squares, etc.--that may be used in mensuration and psychophysical studies.

We are examining the photography to select the targets to be used in the next study so that the ground-truth requirements can be specified.

We have discussed preparing the line-scan and photographic images with [REDACTED]

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[REDACTED]

As we explained in the previous progress report, obtaining the photography over Aberdeen Proving Ground was

more time consuming than we expected. First, it was found that few aircraft/camera systems could fulfill the photographic requirements. Then, after an appropriate system had been obtained, the flight plans prepared, and the test targets placed on the ground, there were delays due to camera malfunctions and poor weather. For these reasons, we request an extension in time of six months, without additional funds.

A proposal is currently being prepared for "Phase II: Execution of the 'field' study." The phrase "execution of the 'field' study" may be misleading. It is not intended to mean collecting the photography, as that has already been done. Rather, we propose to conduct an experimental study including a) collecting performance data from PIs, b) analyzing the data, and c) preparing the technical report.

The original contract costs [redacted]. As of 1 November 1969 [redacted] had been spent, leaving [redacted] costs remaining in the contract. These funds will be used to prepare the line-scan and photographic images to be used in the experimental study (Phase II). They will be made from the Aberdeen photography. As mentioned, discussions have been held with people at [redacted] [redacted] about the preparation of the images. We are seeking the most economical method of obtaining them, but we recognize that they must be thoroughly specified in physical terms, including specifications in terms of both photographic and line-scan image parameters.

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