

IPO/OSB/M-188-66  
27 December 1966

MEMORANDUM FOR: Assistant for Technical Development, NPIC

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ATTENTION: [REDACTED]

SUBJECT: Comments on [REDACTED] Microscope Proposal

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1. The proposal entitled "Micro-Stereoscope and Binocular Microscope Contract [REDACTED] Design Phase I" has been reviewed and the following comments are forwarded for your consideration.

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a. The field of view of this microstereoscope/microscope is smaller than the field of view of the [REDACTED] Zoom 70. This is a serious reduction in area coverage. It must be realized that the larger the field the more information the PI can obtain from a single stereo or mono examination of imagery.

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b. On page 18 it is stated that at the 4X zoom position there will be slight spherochromatism and dominant secondary color; at the 2X zoom a secondary chromatic aberration is dominant and at 1X zoom the secondary chromatic aberration is far larger than the spherical aberration. On page 19 it is stated that lateral color is completely removed by the hyperchromatic field lens. On page 14 however, the Field Lens is stated as having a capability for correction of small, residual lateral color resulting from the zoom system. These statements seem incompatible considering the varying degrees of chromatic aberrations present at the different zoom settings.

c. The resolution figures on page 20 indicate the 1X zoom position to have very poor resolution at the 0.7 and 1.0 field positions in comparison to other objective and zoom settings - for similar magnifications. Since the 1X zoom would be used initially during scanning to a greater extent than the 2X or 4X zoom combinations; better resolution than the 2X or 4X zoom would be even more desirable.

**Declass Review by NIMA / DoD**

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2. Comparison of the 2X rhomboid/Zoom 70 combination and the newly designed [REDACTED] indicates that no great advantage in resolution capability is forthcoming.

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a. It is assumed that the better the resolution/contrast capability available to PAG, the better the possibility for accurate and timely photographic interpretation.

1. The resolving power of an individual's eye can reach 10 line pairs per millimeter at high contrast, with the average approximately six lines per millimeter; the specifications for the [REDACTED] contract state five line pairs per millimeter as an objective - on axis, or less than the average individual is capable of seeing. Why would it not be possible to advance the "state of the art" and produce something better than what is presently contemplated?

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2. PAG has not had a firm commitment from any source stating what resolution/contrast capabilities are actually required to facilitate interpretation of imagery.

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b. The [REDACTED] Zoom 70 has been in use for approximately ten years. This instrument has been improved to provide better resolution by developing 2X and advanced rhomboids which will conceivably raise the resolution to 250 line pairs per millimeter using the 10X eyepieces [REDACTED]

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3. It is the opinion of the Photographic Analysis Group that the [REDACTED] design should be improved by using specifications that would be commensurate with improvement of the state-of-the-art especially where resolution/contrast values are concerned. Since the equipment used to measure the modulation transfer function of microscopes will provide on axis and field angle responses, it is requested that the Zoom 70/2X

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rhomboid combination or other available microscope be compared to the proposed [REDACTED] design. This information will then enable development of a final design of the [REDACTED] or any other microscope that will result in a unit superior to existing equipment.

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[REDACTED]

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Colonel, USA  
Assistant for Photographic Analysis, NPIC

Distribution:

- Orig & 1 - Addressee
- 1 - [REDACTED]
- 1 - Asst. for PA
- 1 - Chrono

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