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DECLASS REVIEW by NIMA/DOD

24 July 1961

MEMORANDUM FOR: Chief, Technical Plans and Development Staff

SUBJECT: Trip Report of [ ] to Boston, Massachusetts,  
13 July 1961.

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1. The purpose of this trip was to inspect the present status of our contract with [ ] on modification of the Image Enhancement Viewer, to discuss with [ ] the project engineer, the work done to date on the modification and redesign of the experimental work, and to discuss further with him the directions that we might plan to go in accomplishing additional work with this particular mechanism.

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2. To summarize his present progress; project section one, manufacture of the instrument, was completed some years ago; section two was the modification of the light source to give a bright image; section three, just now completed, undertook the fabrication of variable density centered filters, the purpose of these to gain better line enhancement as a result of a controlled information loss instead of the arbitrary loss of all low density information. Mr. [ ] report is complete and has as of 10 July been turned over to the administrative echelon of [ ] for edit, etc., and should be down to us in a matter of two or three weeks as a completed piece of paper. I might add the work has proved successful. He has gained an appreciable image enhancement without the tremendous losses of information which were characteristic of the machine in its earlier form. He sharpened his edges without throwing away low frequency data. It should be noted that this, however, has been largely an experimental project and that the machine as it now stands at the end of the completed subtask shows no change from previous modifications. While we have proved its feasibility we have not modified the machine to make the result of the study operationally useful to us.

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3. [ ] next proposal, which he has not as yet written, will undertake to set down the courses of action open to us in continuation of this developmental project, if indeed we feel it worth continuing. The proposal will include two factors; a straightforward one which we will receive proposing a modification of the output end of the machine to include a microscope arrangement which will travel in the plane of the focused image. This will let us get magnification without going to optical systems, cameras, etc., which would pose real problems. The second and more difficult area is in development

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of proper semi-occluding filter systems to exploit the research work completed in this last section. There are two directions such fabrication can go. The first direction would consist of the coating of these semi-occluding Gaussian curved filters on quarter wave length flat glass. This quality of glass is dictated by experiment if indeed we are to deal with ultra high resolution photographic inputs and this requirement includes anything over 25 lines per millimeter. Therefore, we have to go to this kind of glass. The second alternative envisions no glass in the filter plane but instead a rotating solid filter made something on the order of a sunflower or a sunburst rotating around the center and getting the controlled density simply by the spacing of the leaves from the sunflower. Such an approach poses some fairly broad mechanical problems but these problems are not insurmountable. Either approach will require some fairly extensive redesign of our current instrument. They will, however, make it a much more useful thing and the last step in our developmental project. Dick is going to look into both approaches, from a theoretical point of view and from an engineering point of view, and then give us a proposal suggesting probably one or the other and also the aforementioned modification of the output into the machine. This summarizes my conversations with [redacted] and my investigation of our current contract for the image enhancement mechanism.

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4. It should be noted, however, that I did tell Dick that we were considering putting him in for some clearances so he could be a more useful person to us. This met with considerable enthusiasm. I also discussed deliberately our manpower problem with Dick and I think in a matter of time, if we were interested, we could nudge Dick into applying for work with us without too much trouble. I think he would be very interested in doing so. He is not content where he is. He is not doing enough practical work, too much theory, no guidance, etc., and most of the usual complaints. I think he would like to come down and tackle practical applied problems.

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5. As a result of a phone call from [redacted] on Wednesday, I made a point of calling [redacted] while I was at [redacted]. He and [redacted] are soliciting our help in getting a critique of what has happened to their last six proposals. Why were they turned down? I told him that I certainly couldn't undertake such a critique without at least first talking to you and getting your authority. If such a critique were to take place, I believe it more properly would come from you. As a result, [redacted] may contact you sometime around the first of August to see if you will briefly run through the why and wherefore of what happened to these six contracts.

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6. I had a fairly lengthy conversation with [redacted] who took me around parts of the [redacted] installation and showed me some of the

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things they were doing. Two of these in particular have immediate and very interesting implications for us. The first of these areas deals with the microphotography capabilities of [redacted] They are doing some fairly interesting things in the field but most noteworthy to us at the moment, I believe, is their ability to produce excellent resolving power target areas, gratitudes, etc., which we could use for evaluation of instrumentation. They can build these to any reasonable resolution. I have a sample 228 lines per millimeter of fair quality and they consider it a reject. They give two micron line widths for checking of measurements. They guarantee the placement in space of the intercomponent relationships of the basis for checking measurement abilities, etc. I'll try to get prices for us but we might well go for some 70 mm targets, 5½ in. and 9 in. Such targets already exist in [redacted] so there shouldn't be too much of a problem in getting additional ones.

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7. Don also showed me a very primitive but very effective closed circuit television arrangement with ZOOM optics and lots of filter adjustment, contrast adjustments, etc. The thing that surprised me with the system was roughly this: with the one photograph they had built in at the time I was looking at it (and this machine will handle 70 mm roll film) I had a very, very real sense that I was seeing far more from a two-dimensional photograph than I would normally have expected to see. I think it would be a very worthwhile effort for us, if we can afford it, to consider buying one of these packages in a little more finished form with a little better centralization of the instrumentation or controls and putting it in [redacted] area where the photo interpreters can actually work with it as one of the supplemental tools available to them for detailed interpretation. The price shouldn't be excessive, something under [redacted] and we might very well gain a superb exploitation tool. It should be noted, however, that any device we would get at this point would have to be pretty much an experimental thing. We could then go on from there to determine whether we need it more, whether there are modifications that would make it more useful, or whether in point of fact it had the degree of utility that I personally believe such an instrument should have - an excellent visual presentation permitting variable film magnifications, eye HIGH resolution systems and, consequently, would adapt itself to detailed analysis by one or more persons all working simultaneously.

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8. That is about the sum total of the trip. If anything more comes to mind, I will keep you posted. In the meantime, I will spread the word of what I've done to other people who would have an interest.

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