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20 March 1967

MEMORANDUM FOR: Director of Special Projects

SUBJECT : J-3 Flight Evaluation Program

REFERENCE : [redacted]

1. The referenced message is a summary outline of the initial flight test plan of the J-3 system. While I have not spent much time evaluating or studying this test plan, the following initial comments may be of interest to you:

2. In general, I think that the J-3 flight evaluation program should be cast in the context of verifying the systems performance under various operating conditions and with various film types. It is probably a mistake to bill a given experiment as having the primary objective of testing the utility in terms of intelligence value of a particular film type or operating mode. While the majority of the program, per the referenced TWX, is in fact discussed as an engineering test program, this is not uniformly the case; it seems to me it is worth looking very carefully into any experiments which can only be justified as a test of intelligence value.

3. The payload instrumentation plan seems to be reasonably comprehensive; however, as is the case in any experimental program, the key to its utility is in developing the data analysis procedures and analytical modes of expected results against which the test data can

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be prepared. As I think substantial insights of fundamental importance can be gained by this test program, I plan to discuss the data and evaluation plans in more detail with the Project Office.

4. The most interesting performance parameter will be camera system resolution. The test plan calls for photographing various Brainstorm and Corn targets in support of this performance evaluation. I am doubtful that very much of real interest will be learned unless a quantitative measurements program is conducted. One of the more useful techniques in this regard is edge-gradient analysis. As Itek in general appears to be less advanced in this regard than [redacted] and probably Eastman-Kodak, it might be desirable to specifically task one or both of these organizations for support in this area. As you know, the D/NRO has tasked us to examine the entire edge-gradient picture, so we should be in an excellent position to implement a program in the J-3 context. I will discuss this with the Project Office also.

5. A major part of the test program is concerned with the evaluation of various filter combinations. I think this is an extremely important experiment, but I think it can be improved still further by increasing the range of filters explored. I am particularly interested in looking at filters with pass bands which extend into shorter wavelengths. We have as a background in this regard extensive experiments performed in the [redacted] program. As a companion to the filter test program, we probably should mount a vigorous effort towards developing a useful analytical model of the effects of haze on photographic quality.

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6. With respect to the various types of film proposed for testing, I suspect that the SO-180 color film type and the SO-340 night photography tests will be of academic interest only. However, they probably should be done if there are no substantial technical or political penalties. SO-121 (high resolution color film) probably should also be tested.

7. There do not appear to be any experiments programmed to test the possibility of resolution improvements at very low sun angle by using faster films. If 3404 is used under low level lighting conditions, one either suffers serious resolution loss or serious resolution degradation due to long exposure time. Although I have not specifically examined the J-3 performance in this regard, I suspect that 3404 is not the optimum film for light levels below 10° or 15° sun angle. I'll suggest to the Project Office that they have a preliminary look at this problem.

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Chief, Design and Analysis Division
Office of Special Projects

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