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CENTRAL INTELLIGENCE AGENCY

WASHINGTON, D.C. 20505

OFFICE OF THE DIRECTOR

2 AUG 1971

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The Honorable David Packard
Deputy Secretary of Defense
Washington, D.C.

Dear Dave:

I think the second draft that Bob Naka distributed Friday brings us pretty close to a paper that we can agree on. I have attached a modification which I would be happy to endorse.

As you will see, there are a number of changes suggested to the paper; some are suggested for clarification or emphasis only, but most of them deal with five main modifications:

1. There is no doubt that a basis for reasonable disagreement exists about the risk involved in various operational dates for both EOI and FROG. I know that you personally believe that an IOC of 1976 is an appropriate schedule for EOI. At the same time, I think we should let the President know what the range of judgments are in this regard and so some of the modifications are designed to do this. Similarly, I think he should be made to understand that there is also some risk in getting FROG on schedule. I would not like to have him assume that the FROG development is unduly easy or that we can be absolutely sure of its availability in early 1974.

2. In wrestling with the problem of how to describe properly the range of risks and operational dates that might be associated with EOI development, I became uncomfortable with giving the President the possibility of selecting only the extremes; namely, the low risk 1976 and the very high risk 1974 schedules. Therefore, to give him the possibility of taking more risk than we perhaps would recommend but not so much as the Land Panel would prefer, I have added a suboption for an EOI schedule for launch in June 1975. This would also give him a middle risk option

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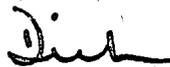
to choose if he wanted to try to get the EOI system operating during his tenure.

3. I think you raised a key question in asking us to discuss the practicability and logic of recommending as a fallback position the option which would build FROG now and two years later start EOI. My own feeling is that the budgetary reasons we have given for rejecting concurrent development of FROG and EOI apply with equal force to the two-year delay option; and the two-year delay has the additional disadvantage of postponing the availability of the system we eventually want. The attached draft therefore incorporates words in this option which make this point. My personal preference would be that we eliminate this option from the paper since it has the same problems as the concurrent development of FROG with EOI but an additional disadvantage which makes it even less desirable.

4. This does, however, leave us with the difficult question of what to recommend to the President to satisfy what may be a great desire for some crisis reconnaissance improvement before EOI can become available. As the paper stands now we offer no practicable alternative. However, there is a possible alternative which we have rejected in the past but which may now be appropriate to revive; namely, the possibility of selecting one of the very low cost interim systems to build concurrently with EOI. Although we have already recognized that these low cost systems suffer from the standpoint of performance, I think we should offer the President the possibility of going this route. I have therefore added this option to the attached draft and, with appropriate caveats about limited performance, have suggested that option as a practicable fallback recommendation to satisfy a possible sense of urgency by the President.

5. Finally, in a more editorial vein, I suggest listing the options in the body of the paper in an order which puts our recommended option first. This arrangement also has the advantage of placing the lowest cost option first and allowing us to describe the cost impact of the other options by citing the amount by which their year-by-year cost increases are greater than Option I, our preference. It would, I think, give the President a better picture of what he would pay to get earlier availability.

Sincerely,



Richard Helms
Director

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GAMBIT HEXAGON ZAMAN

DRAFT MEMORANDUM TO THE PRESIDENT
ON READOUT SATELLITES

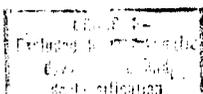
This memorandum presents an issue for decision concerning our plans for acquiring a photographic satellite system for [redacted]

[redacted] Two systems are under consideration involving differences in dates of initial availability, overall capabilities, and levels of immediate and future costs.

The Issue

As you know, the National Reconnaissance Program is supervised by an Executive Committee (ExCom) consisting of Mr. Packard, Mr. Helms, and Dr. David. For a number of years the Committee, and the intelligence community in general, has recognized that a major deficiency of our photographic satellite systems is their [redacted]

[redacted] Therefore, we have been alert to new technological developments which might allow us to fill this gap in our program. A little over two years ago, it became apparent that progress in the technology of solid state sensors presented us with a feasible opportunity. As a result, we started a deliberate, well-funded technology program to build the Electro-Optical Imaging (EOI) readout satellite that Dr. Land recently discussed with you.



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The EOI system uses a very large telescope and fixed arrays of light sensitive solid state elements to measure light intensity of a ground scene. The picture is sent through a sophisticated relay satellite directly to a data processing system [redacted] which will provide a picture for our viewing [redacted]

[redacted] Although it may take several hours to pass a satellite over a specific place of interest, every place in the Sino-Soviet area would be flown over every day [redacted]

that would always be in orbit. The system thus includes the highest level in current technology and offers growth potential for the future. It would satisfy our needs for crisis reconnaissance and indications and warning surveillance, enhance our technical intelligence capability and - after the development is complete - allow an overall reconnaissance program with about the same operating cost that we have now with GAMBIT and HEXAGON but with much greater capability. It would also improve our capabilities to monitor a SALT agreement and can, if desired, support overseas tactical commanders by sending them photos of their local area of interest [redacted]

[redacted] As is true of all photographic satellites, it cannot see through clouds nor see at night [redacted]

[redacted] It must therefore be kept in mind that any photographic system,

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even if it performs up to the most optimistic projections, will give us only limited photographic coverage of many areas. For example, the probability of seeing a given ground point in North Korea at noon during July is twenty percent because of cloud cover. On the other hand, the daily access [redacted] of the EOI makes it possible to take every advantage of good weather when it occurs.

We have invested over [redacted] in research on the technology and the components that would make up the system. Since 1969, when we began, all elements of the program have been meeting or exceeding initial expectations. Thus, the technology has now been demonstrated and we are ready to start the substantial development effort that will be required to make the complete system available. The estimate of when the system can be operating depends on the priority and funds committed to the development and the associated risk of cost overruns that is assumed. The most optimistic estimate, but one with the lowest schedule confidence, is that the system could be in operation in late 1974. A medium to high risk program would plan for operation in 1975, and we have high confidence that the system can be operating in 1976.

In preparing the budget for 1972, we were requested to investigate the possibility of having an interim readout or other form of

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[redacted] system as early as possible to cover crisis situations that might arise before the EOI was ready. After examining a number of alternatives, we selected a readout system called Film Readout GAMBIT (FROG). Although it was the most costly and would take longest to develop, it was the more capable than the other interim alternatives. The system would record the ground scene on film, develop the film in the satellite, scan the film with a laser beam, and send this picture information by electrical data link to an Air Force New Hampshire ground station when the satellite passes overhead. Pictures would be available to us in Washington 12 to 24 hours after they were taken by the satellite.

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The FROG system would use components of the present GAMBIT satellite and its telescope but would add a new film processing and readout system and many new components. Thus it too requires a substantial development to make the complete system available. Again there is a range of estimates about when it could be operating. The most optimistic, based on an urgent development schedule, puts it in early 1974. A moderate risk program would have it operating in mid 1974, a year to a year and a half sooner than EOI on a comparable risk schedule.

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The FY 1972 budget decision by the ExCom was to develop the FROG on the urgent schedule to be available in 1974 and continue the

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EOI development so it would be available by 1976 or shortly thereafter. This recognized that EOI will be a better system, but that there was a big engineering and development job yet to be done. This decision recognized that the FROG could be made available sooner, and could provide an interim readout capability over one or two years until EOI was operational. However, it also recognized that although 12 to 24 hours for picture availability was probably adequate for many crisis situations, it would not fully satisfy your needs in times of great national urgency. Since FROG would require \$600 to \$700M to develop and operate over the next five years, we took this step under the assumption that earliest availability of some form of readout was the paramount concern.

Events that have occurred since we made this decision now make it clear that this plan which involved the initial development and operation of FROG followed in a couple of years by the EOI would have such budgetary impact over the next five years or more that it seems unwise to pursue this course.

Senator Ellender has told us that he would not agree to a budget which includes both these programs and that we should choose between them. His letter is enclosed as Attachment 1.

Even without this specific problem, it has become clear that we are going to have to plan for a reduction in the overall

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level of the FY 72 intelligence budget and we have a number of high priority programs that must continue.

Even if we survive the FY 72 budgetary problems, inevitable budget pressures in FY 73 and beyond would make it difficult to justify carrying two costly programs.

We, therefore, now believe it may be impracticable to contemplate building both these systems. However, since a range of alternative plans are available, we request your decision as to which course of action we should follow.

Alternative Courses of Action

We believe there are five alternatives for you to consider. (The costs of our photo reconnaissance programs through 1980 for each of these alternatives are shown in Attachment 2.)

Option 1: Procure EOI for launch in 1976. This is a modification of the program that we had been pursuing over the past two years and have presented in previous budget submissions.

Option 2: Attempt to procure EOI before 1976 by undertaking a development on a more urgent basis. This is the recommendation of Dr. Land's panel.

Option 3: Initiate development of EOI as in Option 1 for operation in 1976; concurrently build one of the lower cost, much lower performance interim systems for earliest possible launch in late 1973.

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Option 4: Procure FROG now for launch in early 1974 and in December 1971 procure EOI for launch in 1976. This is the option in the FY 1972 budget now before Congress and is the one we are concerned about from a budgetary standpoint.

Option 5: Procure FROG now for launch in early 1974; delay EOI for two years so that the first EOI would be launched in 1978.

Further discussion of these options is provided below. Before elaborating the following additional points are significant:

1. Under no set of circumstances is it possible to obtain even an interim improvement to our crisis reconnaissance capability before late 1973 and we cannot have the major readout capability of EOI before late 1974 at the earliest. During the interim it will be necessary to rely on GAMBIT and HEXAGON satellites and our aircraft to cover crisis situations. On the other hand, by 1974 our conventional capabilities with GAMBIT and HEXAGON will be considerably improved over today. GAMBIT and HEXAGON together will at that time provide photographic satellites on orbit about 300 days of the year, and although their low orbits and film return delays do not allow daily access to all targets or immediate return of the data, they will afford a vastly superior capability to what was available, for example, last summer during the Middle East ceasefire.

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2. The addition of EOI, and to a lesser degree FROG, to our satellite photographic capability will enable an eventual reduction in our need for our present photographic satellites. This will to some degree compensate for the increased cost of the new system.

Option 1: Start Electro-Optical Imaging system procurement in December 1971 with level funding by fiscal year and with IOC about June 1976; terminate Film Readout GAMBIT system design activities.

This option pursues Electro-Optical Imaging system procurement alone on a recommended level of funding not to exceed [] per year until system IOC. With such a funding discipline it appears that an IOC could be expected no earlier than mid-1976. The estimated development cost of the Electro-Optical Imaging system, relay satellites, and ground station in this option is [] and the estimated annual operating cost is [] based on one launch per year.

This option applies fiscal restraints to the NRP budget, keeping total budget levels at or below [] in FY 1973 and FY 1974 and allowing for an orderly development schedule. In addition, the option responds to Congressional Advice concerning the choice of one of the two systems offered.

This would be a deliberate, high confidence development

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program toward a system we want in our inventory; however, it would mean that we would continue to rely on our present photographic satellites, GAMBIT and HEXAGON, and our aircraft to cover any crisis situations that might occur through 1975.

Option 2: Start Electro-Optical Imaging System procurement in December 1971 on an accelerated program with possible IOC in 1975 or late 1974; terminate Film Readout GAMBIT system design activities.

This option corresponds to an urgent effort to attain the EOI system at the earliest practical date but has significant risk of schedule slippage and cost overrun. How much risk depends on the actual schedule selected.

a. IOC in late 1974. This is the Land Panel recommendation and would get the EOI capability at the earliest possible time. However, it is a development on a very urgent basis and thus is the highest risk and highest cost EOI program, costing [] more than Option 1 in FY 73, [] more in FY 74 and a total of [] more through FY 77.

b. IOC in June 1975. This is a deliberate development but one that assumes no design problems occur along the way. Thus it is a higher confidence schedule than 2a above but one with still

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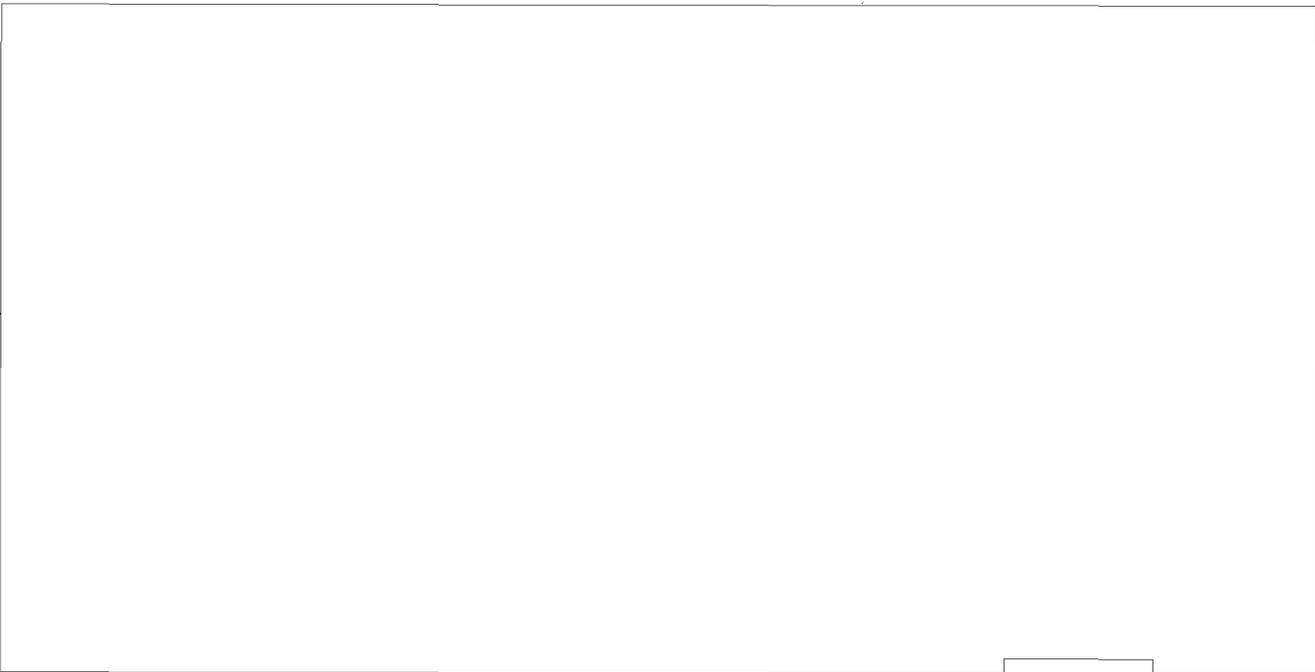
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considerable risk associated with it. It would cost [] more than Option 1 in FY 73, [] more in FY 74 and a total of [] more through FY 77.

Option 3: Initiate development of EOI as in Option 1 for operation in 1976; concurrently build one of the lower cost interim systems for earliest possible launch.

Two options



This course would cost more than Option 1 by about [] in FY 72, [] in FY 73 and a total of [] through FY 77. It would offer the possibility of an interim readout capability as early as June 1973 and would start EOI on a high confidence development schedule for operation in 1976.

Therefore, if you wish to have a crisis reconnaissance capability earlier than EOI can be available, this plan would have

*The characteristics of these two systems are briefly described in Attachment 3.

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minimum impact on EOI and, with your endorsement and support, would probably be feasible to handle from a budgetary standpoint.

If you selected this option we would choose one of the interim candidates within the next few weeks and plan to initiate an urgent development on 1 September.

Option 4: Start Film Readout GAMBIT system procurement now with February 1974 IOC; start Electro-Optical Imaging system procurement in December 1971 with June 1976 IOC. (This is the FY 1972 budget request.)

This option would make available through the Film Readout GAMBIT system the readout and crisis capability on an interim basis in February 1974 and until inception of the Electro-Optical Imaging system capability in June 1976 or later. This option would cost more than Option 1 in FY 73, more in FY 74 and a total of about more through FY 77.

This plan would give us a readout and crisis capability earlier than EOI and provides for the more responsive and productive Electro-Optical Imaging system capabilities on a reasonable schedule. The option presents serious difficulties, however, as it requires major resource allocations in FY 73 and FY 74 and elevates the NRP budget level to or above from FY 73 onward. Moreover, the option is explicitly contrary to Congressional Advice and would require strong defense.

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Option 5: Start Film Readout GAMBIT system procurement now with February 1974 IOC; postpone EOI procurement decision until December 1973 and carry out further technology development ad interim.

This option would make available through the Film Readout GAMBIT system the readout and crisis capability in February 1974 and would delay - perhaps indefinitely - the more capable EOI system.

The same practical budgetary considerations which make us believe that Option 4 (the concurrent initiation of FROG and EOI) is infeasible apply with equal force to this option. Under this option, we would have to make a decision in 1973 to start EOI development. At that time, because of the operational costs of the FROG program, the budget levels facing us in the subsequent years would be about as high as those which are now causing us to recommend against building both EOI and FROG today. If these levels seem prohibitively high now, it is likely that they will seem equally so in 1973. If we were able to hold to this decision in spite of the high budgets, and launch into the EOI development in 1973, over the five years between FY 72 and 77 the total FROG-EOI program would cost more than an EOI only program (Option 1). Through 1980 it would cost more and it would delay the time when we could phase out GAMBIT and realize additional savings.

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Thus this option has the same budgetary disadvantages of Option 4 and one more in addition; it postpones by two years and probably longer the availability of EOI.

Recommendation

The NRP Executive Committee agrees that the US should move toward acquiring the EOI system at some level of funding. EOI is in fact the intelligence system of the future. It has almost open-ended possibilities for growth both in image quality and in image processing. Thus the Committee recommends Option 1-- build EOI only for operation in 1976. This would develop the best capability current technology can offer on a reasonable schedule while relying on our presently operating satellites in the meantime.

However, the Committee does not know how much importance you attach to getting a quick response, crisis reconnaissance capability earlier than any of the EOI programs could make it available. Indeed, we have been unable to find a very satisfactory way to do this. Next to EOI, FROG is the most capable possibility for crisis reconnaissance but it is so costly that we do not think we can have both FROG and EOI. There are some interim systems much less expensive than FROG which we probably could handle concurrently with EOI if

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you gave such a plan your endorsement. However, these systems, while having the same response time as FROG, do not have the quality of resolution or the coverage that one would like to have in many of the crisis situations we have studied. In the past we have rejected them for this reason. However, they would have some utility and could be available in 2-3 years. Thus, Option 3 is the only practical possibility for improving the current capability of GAMBIT and HEXAGON before EOI becomes available.

- I prefer: Option 1 (EOI only, IOC 76) _____
- Option 2a (EOI only, IOC 74) _____
- Option 2b (EOI only, IOC 75) _____
- Option 3 (EOI 76, low cost interim 73) _____
- Option 4 (EOI 76, FROG 74) _____
- Option 5 (EOI 78, FROG 74) _____

The President of the United States

Date

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