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~~ISI~~ NATIONAL RECONNAISSANCE OFFICE  
WASHINGTON, D.C.

MEMORANDUM FOR MR. HELMS  
DR. DAVID

SUBJECT: Draft Memorandum to the President  
on Readout Satellites

I met with Mr. Packard at his home in California earlier this week to review drafts by Dr. David and Mr. Helms. Mr. Packard asked me to forward the attached second draft to you for comment. He expects to return to Washington on Monday evening, August 2.

*Bob*

F. Robert Naka  
Secretary  
NRP Executive Committee

Attachment  
Second Draft Memorandum

cc: David Packard  
John L. McLucas

GAMBIT

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ON READOUT SATELLITES

This memorandum presents an issue for decision concerning our plans for acquiring a photographic satellite system for  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 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 existing in our photographic satellite systems is their inability to return pictures quickly in time of crisis. 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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This system can send good quality pictures [redacted]

[redacted] as they are being taken with very little delay

although it may take [redacted]

[redacted] It will enhance the overall capability of our photographic reconnaissance program. 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, 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. Repetitive sampling improves the probability of success.

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 to a complex data processing system which will provide a picture [redacted]

[redacted] after it is observed by the satellite. We have invested over [redacted] in research on the technology and the components, but a substantial development effort will be required to make the complete system available. The most optimistic estimate is that the system could be in operation

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before 1975. We do not believe this is realistic and recommend we not count on having an EOI before 1976 at the earliest.

In preparing the budget for 1972, we were requested to investigate the possibility of having a near-real-time readout system as early as possible to cover crisis situations that might arise before the EOI was ready. After examining a number of alternatives, we concluded that the best way to have a readout system at the earliest date was with the Film Readout GAMBIT (FROG). This system would use components of the present GAMBIT satellite. 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 twice a day when the satellite passes overhead. Pictures would be available to us in Washington 12 to 24 hours after they were taken by the satellite.

The FY 1972 budget decision by the ExCom was to develop the FROG on an urgent schedule to be available in 1974 and continue the EOI development so it would be available by 1976 or shortly thereafter. This recognized that the EOI was potentially a better system but that there was a big engineering and development job yet to be done. This decision recognized that the FROG involved less uncertainty and clearly could be made available sooner. It also recognized that 12 to 24 hours for picture availability was probably adequate for most crisis situations.

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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 level of the FY 1972 intelligence budget and we have a number of high priority programs that must continue.

Even if we survive the FY 1972 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 plan for EOI only may delay to 1976 or later a readout capability, we request your decision as to which course of action we should follow.

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

Option 1: 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.

Option 2: Procure FROG now for launch in early 1974; delay EOI for two years so that the first EOI would be launched in 1978.

Option 3: Procure EOI only for launch in 1976. This is a modification of the program which we had been pursuing for the past two years and have presented in previous budget submissions.

Option 4: Attempt to procure EOI only before 1976 by undertaking a crash program.

This is the recommendation of Dr. Land's panel.

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

1. Some members of the intelligence community feel that procurement of FROG will either delay for a long period or completely prevent further work on the EOI satellite because of

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budgetary and other factors. Therefore, they feel that Option 2 is not realistic. Other members of the community, however, feel that a properly phased procurement cycle can provide the EOI satellite late in the 1970s with the FROG operational in the meantime.

2. The addition of either EOI or FROG to our satellite photographic capability will enable a reduction in our need for our present photographic satellites. This will to some degree compensate for the increased cost of these new satellites.

Option 1: 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. The Film Readout GAMBIT system development cost is estimated to be \$187M and annual estimated costs are \$100M per year based on two-plus launches per year at \$41M each. The estimated development cost of the Electro-Optical Imaging system, the relay satellites, and the ground station in this

(b)(1)

(b)(3) 10 USC § 424

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option is [ ] and the estimated annual operating cost is [ ] based on [ ] per year with greater than [ ] [ ] expected vehicle life.

This option will give us the earliest possible readout and crisis capability and provides for the potentially more responsive and productive Electro-Optical Imaging system capabilities on a reasonable schedule. The option presents difficulties, however, as it requires major resource allocations in FY 1973 and FY 1974 and elevates the NRP budget level to or above [ ] from FY 1973 onward. Moreover, the option is explicitly contrary to Congressional advice and would require strong defense.

Option 2: Start Film Readout GAMBIT system procurement now with February 1974 IOC; postpone Electro-Optical Imaging system 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 the potentially more responsive Electro-Optical Imaging system until about 1978. The estimated development cost in this option of the Film Readout GAMBIT system and its ground station is \$187M and the estimated annual operating cost is about \$100M, the same as Option 1. The estimated development cost of the Electro-Optical Imaging system, its relay satellites, and ground

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station is [ ] and the estimated annual operating cost is [ ] based on [ ] per year. These costs are somewhat greater than those in Option 1 because of the longer development time and a larger allowance for inflation.

This option has utility if there is an urgent need for the readout and crisis capability but it applies budgetary restraints to the NRP, especially during FY 1973 and 1974. In addition, the option is apparently responsive to Congressional advice to choose one of the two systems this year but there might be a problem in obtaining funding later (see Attachment 2). The option has the disadvantage of postponing for an extended period an attempt to attain the inherently great potential of the Electro-Optical Imaging system with an IOC no earlier than 1978.

Option 3: 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 resembles our previous budget requests.)

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

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in this option is [ ] and the estimated annual operating cost is [ ] based on [ ] per year. These costs are different from Option 1 because of differing constraints.

This option has utility if there is not an urgent need for this improved readout and crisis capability. The option applies fiscal restraints to the NRP budget, keeping 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.

Option 4: Start Electro-Optical Imaging system procurement in December 1971 in an accelerated program with possible December 1974 IOC; terminate Film Readout GAMBIT system design activities. (This is the Land Panel recommendation.)

This option corresponds to an urgent effort to attain the Electro-Optical Imaging system capability at the earliest practical date but has significant risk of schedule slippage and cost overrun. The estimated development cost of the Electro-Optical Imaging system, its relay satellites, and ground station is [ ] assuming the development can in fact be done in a shorter period, and the estimated annual operating cost is [ ] based on [ ] per year, the same as Option 3.

This option is simply Option 3 accelerated to the earliest possible date. The option has difficulties in that it has

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significant possibility of cost overruns and schedule slippages. It could be vulnerable to subsequent Congressional action and require strong defense because it requires well over  in each FY 1973 and FY 1974.

#### Recommendation

The NRP Executive Committee agrees that the U. S. should move toward acquiring the EOI system at some level of funding. EOI is in fact the intelligence imaging system of the future. It has almost open-ended possibilities for growth both in image quality and in image processing. The Committee attaches different importance to the urgency and its associated risk and to the price worth paying in attaining this capability. We are, therefore, presenting this issue to you for your decision.

The ExCom recommends Option 3 because it develops the best capability current technology can offer on a reasonable schedule while relying on our presently operating satellites. If you believe there is an urgent need for this capability at an earlier date, we recommend Option . (ExCom, see note on page 13.)

David Packard  
Chairman  
NRP Executive Committee

#### Attachments

1. Ellender Letter (BYE-78249-71)
2. Cost Data

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I prefer Option 1 \_\_\_\_\_

Option 2 \_\_\_\_\_

Option 3 \_\_\_\_\_

Option 4 \_\_\_\_\_

The President of the United States

Date

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## NOTE FOR EXCOM ON FALLBACK OPTION

In discussing the fallback option with Dave Packard, he felt there were two or three choices. The argument for each goes something like this.

A. Option 2

1. This option is good because:

a. It takes care of the budget difficulty in FY 1972 and appears to satisfy Congressional concerns.

b. The additional two years may provide a more mature EOI system having, for example,  capability.

2. On the other hand, it is poor because:

a. In FY 1974 the budget for FY 1976 and 1977 looks almost as bad as FY 1974 and 1975 appear today. The problem has only been pushed downstream.

b. Two years of valuable time may have been lost in bringing EOI to fruition.

B. Option 1

1. This option can be said to be better than Option 2 for reasons opposite to those cited above. Thus:

a. It achieves EOI capability sooner.

b. It faces up to the budget problem.

2. It can be said to be poorer because:

a. Today's budget problem is impossible.

b. A less mature EOI will be produced.

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C. No option

A way to avoid the budget problem is to propose that there is no satisfactory fallback option.

Dave Packard wishes to have a discussion on these points.

*Bob*

F. Robert Naka  
Secretary  
NRP Executive Committee

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# United States Senate

COMMITTEE ON APPROPRIATIONS

WASHINGTON, D.C. 20510

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July 9, 1971

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

Dear Mr. Secretary:

Reference is made to our previous discussions of the necessity of proceeding with the development of the satellite readout systems as proposed in the classified budget for the National Reconnaissance Program.

I want to express again my view that we should proceed with the development of only one of these systems. Judging from the information given me, it would be advisable to proceed with the Electro-Optical Imaging System.

It is my hope that the NRP Executive Committee will review this matter and advise me of the one system that should be developed and the adjustments that should be made in the pending budget requests.

I am addressing a similar letter to Honorable Richard Helms, Director of the Central Intelligence Agency.

With kindest regards and best wishes, I am

Sincerely,

*Allen J. Ellender*  
ALLEN J. ELLENDER  
Chairman



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