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AR-1

11 August 1971

MEMORANDUM FOR: The Secretary of Defense

SUBJECT : Readout Satellites

REFERENCE : Memo from The Secretary of Defense  
to the DCI, 9 Aug. 1971

1. I have reviewed the referent memorandum and agree with Dave Packard that we should solicit the President's views as to how we should proceed toward acquiring a readout satellite capability.

2. After several weeks of drafting and a number of meetings, the EXCOM was not in agreement as to the appropriate content of an issue paper. Dave recommended sending separate memoranda and I agreed. Attached is a copy of the document I prepared for this purpose.

/s/

Richard Helms  
Director

Attachment: a/s

Distribution:  
copy 1 - Mr. Laird  
copy 2 - Mr. Packard  
copy 3 - ER  
copy 4-5 - DDS&T Reg

Originator: CEDuckett:ab 10 Aug 71

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## CENTRAL INTELLIGENCE AGENCY

WASHINGTON, D.C. 20505

OFFICE OF THE DIRECTOR

9 AUG 1971

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## MEMORANDUM FOR THE PRESIDENT

Since 1969 the Executive Committee of the National Reconnaissance Program has been proceeding with a deliberate, well funded program leading to development of the EOI system that Dr. Land recently discussed with you. Until our decisions in April, we projected operations in about June 1975. We held this course and regularly programmed for it in our budgets because we all agreed that EOI would both significantly improve our total capability and give us a more economical overall program.

Last year, in the wake of the Mid-East Ceasefire, we also studied a range of lower cost, rapid-response systems with the idea that we might build one of them concurrently with EOI and get an interim improvement to our crisis reconnaissance capability until EOI became operational. Our premise was that we did not want to interfere with EOI, which was the only system that could satisfy our full range of crisis needs and other requirements as well.

In April, when we received an indication from Mr. Schultz that you wanted a readout capability within your administration, we tentatively selected FROG, the most capable but also most costly of the interim possibilities, to be built along with EOI. Subsequently, our own concern about the overall size of budget and direct opposition from Senator Ellender have combined to make it apparent that this plan is fiscally impracticable.

Thus, we are still seeking a solution to what we understand to be your desire for an earlier capability, and since there is a range of possibilities with varying degrees of utility and cost, we are submitting the issue to you for decision.

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The discussion of the issue so far has focussed on FROG as a way to get an earlier capability; and Mr. Packard and Dr. David have submitted a memorandum which recommends that the way to get a readout system earlier than 1976 is to build FROG now and delay the start of EOI development by two years.

I am writing a separate memorandum because I do not agree that we should develop FROG as the solution to an earlier capability. I have three reasons for this:

- FROG is so costly to operate that a combined EOI-FROG program, however phased, appears impracticable from a budgetary standpoint.

- FROG's capability is too limited to consider it as a long-term supplement to our total photo reconnaissance program.

- There are other, less costly ways to get something earlier than 1976.

Crucial to this whole issue are the estimates about when various systems could be ready and what they would cost. Both FROG and EOI would require substantial development and both are liable to schedule slip and cost overrun. I am persuaded by the studies of Dr. Land and his Panel that on schedules of comparable urgency FROG and EOI are only a year or so apart.

The question then that we are trying to answer is how much to pay in terms of money or other intelligence capabilities in order to improve our capability for crisis reconnaissance during a one year period or so in 1974-75. My conclusion is that closing this gap is not sufficiently important to pay the combined cost of the FROG program, a two year delay in the availability of EOI, and the risk of deferring EOI indefinitely.

Instead, I suggest the following possibilities for your consideration:

Option 1: Start EOI development in December for launch in June 1976. This is consistent with one of the options recommended by Mr. Packard and Dr. David. It would mean that we would continue to rely on GAMBIT and HEXAGON satellites and our aircraft to cover crisis situations that occur before 1976. By 1974 GAMBIT and HEXAGON together will provide satellites on orbit about 300 days of the year and although they are less capable than we would like for crisis reconnaissance, they can do a much better job than we were able to do last summer over the Middle East.

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Option 2: Start the EOI development process now rather than in December, and aim for late 1974 operations as Dr. Land has recommended. This would cost about [ ] more over the next five years than Option 1. It would give us relatively high confidence that we would have an operative system at least in 1975.

Option 3: Start the EOI development in December for mid-1976 operations, and let us select for development one of the lower cost, quick-response systems for operation in 1973. Some of these systems have unique characteristics of lower vulnerability and "surprise launch" which would make them of continued utility after EOI comes along. This would cost about [ ] more over the next five years than Option 1.

DISCUSSION

To support this line of reasoning, I would like to discuss the candidate systems in terms of the five topics which I think are most relevant to your decision.

The Requirement Gap.

I am concerned that our obvious need for better crisis reconnaissance has obscured the broader aspects of our need for a high quality readout system.

From the beginning of photographic satellite reconnaissance, we have been dissatisfied with the delays, the inflexibilities, and the high operating costs inherent in film return systems. These deficiencies manifest themselves most dramatically in times of crisis - the 1962 Cuban Crisis showed us how important rapid return of photographs can be, the 1968 Czech Crisis and most recently, last summer's Mid-East Ceasefire have demonstrated what problems we face without this capability. But there are other, less obvious consequences of the limitations of our current systems. Most noteworthy are their [ ]

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(Our current high resolution system gets, on the average, about [ ] quality pictures a year of each high priority target in places like the Soviet missile test ranges and ABM test areas.)

Until recently, technology was not able to provide an economically feasible prospect for correcting enough of these deficiencies to be worth the high cost of putting a new satellite system into our inventory.

However, a little over two years ago, new developments in solid state devices presented that opportunity and we began to put substantial funds into a technology and component development program for the EOI satellite system. Last spring, as the detailed design evolved, it became clear that this system would indeed make the broad improvements that were needed. It would fully satisfy needs for crisis reconnaissance, and, in addition, perform daily indications and warning surveillance, enhance our technical intelligence capability and - after development is complete - allow an overall reconnaissance program with about the same operating cost we now have with GAMBIT and HEXAGON but with a much greater capability.

The Relative Capability of EOI and FROG.

I am concerned that the substantial difference that exists between EOI and FROG capabilities has become blurred. FROG is a capable system and so it is easy for this blurring to occur. But EOI is more powerful than FROG in all aspects, a fact which can be illuminated in terms of the intelligence jobs which have to be done.

FROG can do an excellent job for crisis reconnaissance from the standpoint of frequency of coverage and resolution. In addition, its data return time (12-24 hours) is sufficiently fast to make photography useful in most crisis situations. Our studies of the past, however, make it clear that when a crisis becomes so grave as to warrant personal Presidential attention - such as was true in Cuba in 1962 - the delay time inherent in the FROG system will not be acceptable.

FROG offers little or no enhancement to our current technical intelligence capability. At sacrifice to its lifetime and its capability for crisis coverage, the FROG system can be flown at a low enough altitude to give some

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1-foot best resolution; however, at this altitude it suffers the same accessing limitation as GAMBIT and, since it does not have as good resolution, I do not think we should assume that FROG would allow us to reduce the number of GAMBIT systems that we fly in the future. As I look forward to a possible SALT agreement with the Soviets, I am convinced that our need for high resolution coverage of important targets will increase rather than stay constant or decrease. By accessing routinely more than 5 times as many targets as GAMBIT, EOI can help satisfy that need and reduce our requirement for GAMBIT as well. FROG, if assumed to be an add-on to the current HEXAGON and GAMBIT programs, will contribute little to that need. If GAMBITS are dropped from the schedule to reduce FROG's total cost, FROG will detract from this technical intelligence objective.

Low Cost Quick-Response Systems.

I am concerned that the virtues of lower cost, quick-response systems, in particular their lesser vulnerability and their "surprise launch" capability, have been obscured by focussing the issue on FROG.

After the Mid-East crisis last summer, the Executive Committee of the National Reconnaissance Program directed a rather extensive study into all potential candidates for a low cost, quick-response system that might be developed quickly to meet crisis reconnaissance needs until such time as EOI could become operational. Several of the systems studied could probably be built in less than two years with a five year cost under \$200M. However, their target coverage capability was necessarily limited, and their resolution was on the order of 3-5 feet, which could meet many, but not all, crisis needs. For this reason, we rejected them in favor of the FROG system when we made our decision to develop both FROG and EOI concurrently last April. These low cost systems do have utility, however, and would improve our current capability for crisis reconnaissance. As mentioned earlier, some of them could also be used as a contingency system in case the Soviets should interfere with our regular satellites. In addition, the "surprise launch" characteristic that makes these systems less vulnerable also suggests that they might be used for SALT monitoring at unexpected times between the periodic and predictable overflights of our regular satellites.

If you decided to have us proceed with one of these systems, we would need about a month to complete our studies and make a selection; and we could probably start a development program in September or October.

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~~TOP SECRET~~Relative Schedules.

I am concerned that the risk involved in the FROG development has not been made clear enough. I think it is important to recognize that some probability exists that FROG development could not be completed by early 1974, and that on schedules of comparable urgency the most probable date of FROG availability may be only a year or so earlier than that of EOI.

For EOI the range of probable dates goes from November 1974, a very low confidence estimate, to mid-1976, a very high confidence one, and with moderate risk associated with mid-1975. A similar range of estimates would apply to the FROG system also. I believe in general there has been a tendency to underestimate the difficulties and complexities of the FROG approach because of origins in GAMBIT. Although the FROG does use components of the present GAMBIT satellite and its telescope, it would add a new film processing and readout system and many other new components that need to be qualified for a long lifetime. Thus it, too, requires a substantial development to make the complete system available. The most optimistic estimate about when it could be operating is early 1974. A more moderate risk program would have it operating perhaps in mid-1974. All in all, I am persuaded by the Land Panel conclusion\* that on a comparable risk basis FROG and EOI are about one year apart as to date of availability.

Budgetary Considerations.

I am concerned that the risks and the budgetary consequences of adding a program the size of FROG (\$600-700M over the next five years) to a delayed EOI program have not been fully discussed.

Last April we had hoped to satisfy the desire for earlier availability by building both FROG and EOI concurrently. As our studies progressed, however, it became clear that for the next 4-5 years this dual program would add well over [ ] annually to the reconnaissance budget and we, therefore, concluded this was no longer a practicable approach. Not only were we unwilling to risk other high priority programs with such a high budget but Senator Ellender has told us he would not agree to both programs.\*\* One of the options which

\*Their report is enclosed as Attachment 1.  
\*\*Senator Ellender's letter is enclosed as Attachment 2.

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Mr. Packard and Dr. David propose (to build FROG now and defer EOI start until 1974) would indeed reduce the impact in FY 72 and 73; however, in subsequent years it would suffer from almost the same total dollar considerations which now make us believe it impractical to attempt both systems concurrently. Under this plan we would face a decision in 1973 to start EOI development. At that time, because of operational costs of the FROG program (slightly over \$100M a year), and perhaps cost overruns from a slipping development schedule, the budget levels facing us downstream would be about as high as those now causing us to recommend against building both EOI and FROG today. If these levels seem prohibitively high now, it is likely that they would appear equally so in 1973. For this reason I believe that a decision to go this route at this time would, in effect, be a decision to defer the EOI program indefinitely.

For the moment, however, let me assume that we would start EOI in 1973 or 74 in spite of the high budgets in subsequent years. Over the five years through FY 77 the total FROG-EOI program would cost [ ] more than EOI alone. Through 1980 it would cost [ ] more and would delay the time we could phase out GAMBIT and realize additional savings. This cost, together with a two year delay in EOI capability, is the price we would pay to advance improvement of our crisis capability by a year or so in 1974.

#### Recommendation.

In summary, I share fully the desire to have a highly responsive photo satellite capability at the earliest time. I am, however, also concerned about improving our SALT monitoring ability and maintaining the economic viability of our overall photo reconnaissance program in the future. Because EOI will do these additional things and is technically ready to begin development, I would like to proceed with it as soon as possible. Because FROG will not do these additional things, I do not think it is worth the \$600-700M to develop and operate it over the next five years.

The question that we are trying to answer is how much to pay in terms of money or other intelligence capabilities in order to improve our capacity for crisis reconnaissance during a one year period or so in 1974-75. My conclusion is that closing this gap is not sufficiently important to pay the cost of the FROG program, a two year delay in the availability of the much more powerful EOI system, and the risk of deferring EOI indefinitely.

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Instead, I invite for your consideration the following range of options.\* I have listed them in the order I would recommend:

Option 1: Start EOI system procurement in December 1971 with a yearly fiscal limitation of about [ ] for operations in about mid-1976. This is the same option recommended by Mr. Packard and Dr. David as their Option 1 except that it would not limit FY 72 funds to [ ] a limitation which would preclude operations in 1976 and any possibility of accelerating the schedule to 1975 if things go well in the early stages of development.

Option 2: Start the EOI development process in September 1971 and program for a December 1974 first launch. This plan would give us the possibility of late 1974/early 1975 operations, and relative high confidence of having a system before the end of 1975. I recommend Option 1 because it is fiscally more manageable and more acceptable to Mr. Packard and Dr. David.

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. This could give you a limited crisis reconnaissance improvement as early as 1973 and an operational EOI system in 1976.

For the sake of completeness, I list but do not recommend:

Option 4: Start FROG procurement now for operations in 1974. On completion of FROG development in 1974 begin system development of EOI for operations in 1979. This is the option recommended by Mr. Packard and Dr. David as a way to get earlier readout capability.

/s/

Richard Helms  
Director

\*See Attachment 3 for estimated 10-year costs.

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AR-1

November 1971

EOI Study Group

1. Present plans call for a near-real-time Electro Optical Imagery system to become operational in FY 1976. This highly responsive photo collection system promises to strengthen considerably the accuracy and relevance of all-source intelligence production. We are presented with the opportunity and the challenge to develop the best ways in which to integrate this new capability with other resources of the intelligence production function.

2. Although EOI will not be operational until 1976, the time is now at hand for intensive study and detailed planning to ensure effective integration of its resources with the other resources available to the intelligence community. To carry out these responsibilities, an EOI Study Group is hereby established. This Group will be the focal point for continuous, full-time evaluation and study of the interfaces between the EOI system, the production offices, and the community.

3. The EOI Study Group will work within the framework of two basic assumptions made on existing procedures:

(a) That NPIC will be responsible, as a service of common concern, for the first phase exploitation of EOI.

?

(b) That COMIREX will be responsible for general management, creation, and coordination of target decks for use in targeting EOI collection, and with providing exploitation guidance to NPIC and other photointerpretation resources.

Lawrence  
Lash...

4. Some of the problems and operational challenges posed by EOI cannot be fully appreciated and properly studied until the specific design specifications of the project and its facilities are finalized; others require management decisions to be made at very early stages of the project.

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5. Two high priority problems which require immediate consideration are:

(a) A review of the exploitation functions to be performed at the EOI processing facility, the adequacy of the planned facilities, space requirements, and the numbers of processing and production personnel to be accommodated at the facility. Guidance on this question must be furnished by 1 February 1972.

(b) An in-depth study to classify the various special and general tasks that will be placed on the system. This study, to be done in conjunction with COMIREX, would include guidance on distribution of targets, collection tasking, processing, dissemination and production, and the varieties of software needed to support the system.

6. The EOI Study Group must also consider a broad range of administrative and functional issues which need be thoroughly thought out and decided by the time the EOI system is operational. These include:

(a) Tasking procedures.

(b) Integration of <sup>the product that is</sup> EOI with other collection systems such as COMINT and ELINT.

(c) Relation of NPIC and departmental exploitation and interpretation units such as IAS to <sup>the</sup> EOI processing <sup>and interpretation activities</sup> ~~facility~~.

(d) Relation of EOI imagery to daily intelligence and research function and the integration of EOI imagery.

(e) Examine the applicability of analytical techniques such as sampling procedures, statistical methods, modelling techniques and simulation to the production process, utilizing as necessary assistance from external research agencies.

(f) The community-wide aspects of EOI tasking, processing, dissemination, and initial exploitation as a service of common concern.

*What about  
CIA requirements?*

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7. Attached at Annex A are a list of specific topics for which thorough investigation and study are required before EOI is operational. The timing and the phasing of these topics will vary according to the progress of the EOI project and the specific decisions made regarding fundamental operating procedures and responsibilities. A number of the topics transcend exclusive Directorate of Intelligence interests and will ultimately require community-wide consideration and acceptance. Some can be handled through existing machinery, such as COMIREX; others may require the creation of ad hoc interagency committees.

8. Attached at Annex B are some considerations regarding the staffing of the EOI Study Group and the representation required from the Directorate of Intelligence as well as the Directorate of Science and Technology.

Attachments:  
Annex A  
Annex B

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ANNEX A

EOI Study Group Topics

1. The following listing of topics that would be considered by a DDI EOI Study Group is not presented as being either all inclusive or mutually exclusive. The need for some of the suggested study topics may be eliminated as basic administrative and management decisions are made. Other problem areas may arise that will not be identifiable until we approach closer to the time when EOI becomes operational.

2. Some of the study topics are obviously of both community and Directorate concern. They may be worked out independently by the Study Group and at the appropriate time submitted to interagency groups or the community for coordination; or they may be Study Group contributions to planning studies prepared by COMIREX or NPIC,

3. The topics are not presented in order of priority or sequence of investigation.

a. Evaluate the targeting strategies and basic guidelines for regularized system coverage by EOI including classification of targets, frequency of coverage, and relation to capacity of the system.

b. Examine alternative rules and procedures for ad hoc tasking of the system and the impact of such intervention on regularized collection.

c. Assess the content and standard operating procedures for first phase exploitation by NPIC and the allocation of responsibilities for current intelligence exploitation, and non-time dominated (3rd phase) exploitation.

d. Assist in establishing Agency and community guidelines and procedures for use of the EOI system and access to its product.

e. Assess detailed personnel requirements for photointerpretation and reporting functions at the processing center. This would include consideration of such questions as inter-Agency representation and the need for area and functional specialists in addition to photo interpreters.

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f. Consider the relationship of existing departmental units--(IAS, DIA)--to both NPIC and EOI in terms of readout and analysis responsibilities.

g. Assist in the formulation of ground rules for the centralized tasking of an EOI system and the relation of national intelligence interests to those of departmental units as well as military field and tactical commands.

h. Evaluate the projected day-to-day data flows and impact of EOI on the following specific responsibilities and determine if procedural changes are needed:

- (1) Warnings/Indications
- (2) Military Analysis
- (3) Crisis Management
- (4) Current Intelligence
- (5) Target Surveillance and Activity Analysis
- (6) Monitoring of Arms Limitation or Disarmament Agreements

i. Conduct studies to assist COMIREX in projecting targeting requirements for each of the functions discussed in paragraph 3. h.

j. Conduct studies to determine the adequacy of current national indications lists in relation to EOI capabilities and, if necessary, study the feasibility of unique indications signatures applicable to imagery holdings.

k. Examine alternative types and formats for reporting EOI-derived intelligence, including frequency, and dissemination controls.

*Handwritten notes:*  
COMIREX  
EOI

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l. Evaluate procedures for community coordination of EOI-derived intelligence and consider the question of administrative responsibility for reporting the EOI product.

m. Examine support information and data requirements of the processing facility.

n. Survey Directorate and Agency capabilities for support of the EOI Study Group.

o. Determine the need for support from external research agencies in such matters as systems analysis, sampling procedures, statistical methods, modelling techniques, and simulation.

p. Assess procedures for the integration of EOI information with other major collection systems.

q. Determine the need for modification of DDI working and production procedures in relation to the EOI system.

r. Consider the need for and advantages and disadvantages of integrating the various Agency operation centers.

s. Work with COMIREX in evaluating system flows and the major alternatives throughout the collection tasking, processing, dissemination, and production cycle.

t. Identify equipment and facility requirements external to the EOI facility in terms of computers, video and communications data links in terms of EOI system users.

u. Study the nature of EOI data base requirements, their relation to other data systems, and the question of whether the various data systems should be fully integrated.

v. Serve as a focal point for interface during planning, design, and construction phases between system users and system designers and planners.

*and DDSEAT*

*12 Nov 1961  
DIA ?*

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Approved for Release: 2021/04/08 C05104928

ANNEX B

Staffing of EOI Study Group

1. Tentative planning is that the EOI Study Group would be a full-time staff of eight professionals and two clerk-steno positions reporting directly to the Deputy Director for Intelligence.
2. The staff would be located on the Ground floor where adequate space is available in Room
3. Personnel staffing should be based on ensuring a broad representation of the production interests of the DDI and DDS&T, as well as personnel well versed in imagery analysis. It is hoped that DDS&T will play an active role in the Study Group. If possible, it is hoped that DDS&T would provide representative from both OSI and FMSAC.
4. The interface between the EOI Study Group, the EOI system, and the community will be achieved by working in close collaboration with OSP and COMIREX.

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First-Phase Exploitation

First-Phase Exploitation is the preliminary, rapid interpretation of newly acquired imagery for the purpose of extracting, organizing, and communicating information to satisfy immediate priority needs.

Second-Phase Exploitation

Second-Phase Exploitation is the systematic review of newly acquired reconnaissance imagery for the purpose of providing a succinct, organized, and comprehensive summary of the information extracted, or available for extraction from the imagery obtained by a mission.

Third-Phase Exploitation

Third-Phase Exploitation is the exploitation in depth of reconnaissance imagery for the purpose of extracting and coherently organizing the accurate, detailed, and comprehensive information required in the production of intelligence.

Basic Intelligence Support Exploitation

Basic Intelligence Support Exploitation is that imagery interpretation effort which is undertaken to provide a flow of basic image-derived information required by more than one agency, department, or command. It is a step-by-step process of extracting and accumulating information from reconnaissance imagery. Basic Intelligence Support Exploitation involves and is limited to the derivation of information on each specific installation, object, activity, or search area examined. It requires the preparation of an authoritative base report which is augmented by information derived from subsequent First- and Second-Phase reporting and is updated periodically, or as required by appropriate authority, during Third-Phase Exploitation. Basic Intelligence Support Exploitation can be provided as a service of common concern and effectively programmed against the acquisition of all modes of reconnaissance imagery.

Direct Support Exploitation

Direct Support Exploitation is that imagery interpretation effort which is undertaken in direct and timely support of the assigned mission of an agency, department, or command. It is a dynamic "on demand" process in which directly subordinate imagery interpretation resources must be applied to meet the spectrum of intelligence needs of a higher authority which cannot be satisfied by Basic Support Exploitation. Direct Intelligence Support Exploitation thus is continuously oriented in support of the mission of an organization, rather than toward providing a flow of basic image-derived information from the imagery acquired by each successive reconnaissance mission. It is responsive to the changing needs of the higher authority being supported and can be effectively programmed only by that authority.

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12 OCT 1971

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NOTE FOR:

[Redacted]

1. [Redacted] from IRS called for [Redacted] asking should [Redacted] (the CIA member of ICRS/COMIREX) support 275 feet of color film on Mission 4334 in January. This is 1/2 the customary 500 feet add on.

2. I replied I would support this, especially as I knew we still had [Redacted]

[Redacted]

3. I checked through OSP to EK to determine that the yellow (approximately) Wratten 8 filter which was on the lens of 4332 will be replaced on both the October 4333 and January 4334 Missions with a filter approximating Wratten 3 (very light yellow). The color balance on the color film and its duplicates for 4333 and 4334 should be quite good and considerably superior to that in 4332 with its almost total lack of blue in the original.

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Note Cont'd.

4. The superior image quality of 4332 due to the new color corrected lens and longer focal length should continue for Missions 4333 and 4334.



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<i>Dr. L. Peber - 6F30</i>							
<i>Dr. Steininger 6E5-6</i>							

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THE DEPUTY SECRETARY OF DEFENSE  
WASHINGTON, D. C. 20301

AR - 5

4 OCT 1971

Honorable Allen J. Ellender  
Chairman, Committee on Appropriations  
United States Senate  
Washington, D. C. 20510

Dear Mr. Chairman:

In response to your letter of July 9, 1971, we have thoroughly reviewed the capabilities, timeliness, and costs associated with the readout photographic reconnaissance programs: Electro-optical Imaging system and Film Readout GAMBIT system. We have decided that only one program, EOI, is necessary. On this basis, we can identify \$120M, which we had programmed for FROG, for deletion from the FY 1972 budget of the National Reconnaissance Program.

We also decided earlier to cut back the TAGBOARD drone program which reduced the NRP by \$2.6M.

The NRP is a very important program and we hope to have your continuing support.

Sincerely,

David Packard

✓ Richard Helms  
Director, Central  
Intelligence Agency

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**GAMBIT**

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24 AUG 1971

Dr. George M. Low  
Deputy Administrator  
National Aeronautics and Space Administration  
Washington, D.C. 20546

Dear George:

Thank you for following up our luncheon with your letter of 13 August concerning the space shuttle program.

From my viewpoint, it is very important that we maintain the close liaison that has existed between our two organizations. We here have benefited a great deal from that relationship over the years and, in turn, have welcomed those opportunities when we have been able to be helpful to you.

Our people will continue to stay close to your programs and will pay particular attention to your activities and progress in the space shuttle program.

Sincerely,  
/s/ Richard Helms

Richard Helms  
Director

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13 August 1971



The Honorable George M. Low  
Deputy Administrator  
National Aeronautics and Space Administration  
Washington, D. C.

Dear George:

This is to thank you most warmly for the lunch and briefing we had at NASA on Monday. You and your associates did a fine job of bringing us up to date on your present programs and projections for the future. It was informative and helpful to us, and we much appreciate it.

Cordially,

*Richard Helms*

Richard Helms

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
WASHINGTON, D.C. 20546

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OFFICE OF THE ADMINISTRATOR

AUG 13 1971

Honorable Richard Helms  
Director of Central Intelligence  
Washington, DC 20505

DD/S&T#2500-710

Dear Dick:

On reflecting about our visit with you several days ago, it occurred to me that, in talking about the proposed space shuttle, we may not have done justice to those aspects that might be of particular interest to you as Director of Central Intelligence. Let me try to do this now and start by summarizing for you the rationale for the shuttle development.

Responsible officials of government, industry and the scientific community recognize a continuing requirement for activities in space.

- The nation's security requires surveillance of the earth's surface, the atmosphere, and regions of space through which attack or other hostile endeavors may be directed toward the U.S. and its allies.
- Space-borne sensors promise increased knowledge of weather and of other conditions prevailing or developing on the sun, in the atmosphere, and on the earth and oceans. This knowledge enables man to better protect himself and his activities from natural disasters and to husband the natural resources required for our continued well being.
- Space activities are essential for scientific examination of the universe, for knowledge of sun-earth relationships, and for better understanding of the relationship between man and his environment.
- Satellites are now and will continue to be essential for worldwide communication and data transfer and management, for air and sea navigation and traffic control.
- Orbiting laboratories can provide scientists and engineers opportunities for experimentation in the unique environment of space.

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- In short, the upper atmosphere and the space beyond provide man with a limitless frontier where the technically advanced nations of the world are challenged to demonstrate their competence.

Because of the very high costs and technical constraints imposed by existing launch vehicles and spacecraft, only the most important of the available opportunities can be pursued today. Looking ahead to the late 1970's and the following decade, it is possible to build a new system which will:

- greatly reduce the cost of placing spacecraft in orbit,
- permit the construction of simpler spacecraft and payloads,
- make possible the checkout, replenishment, or servicing of spacecraft in space or their return to earth for repair, modification, updating,
- provide opportunity for a wide range of experimentation in physical and biological sciences and applications for practical purposes including assessment of the role of man in space activities,
- provide short response time to unforeseen events of a technical, military, or political nature which require space activities.

To achieve these promised benefits, it will be necessary to develop, build, and operate a transportation system comprised of reusable vehicles and associated supporting facilities:

- a manned first-stage booster to launch and accelerate a second-stage vehicle (shuttle) and then fly back to its launch site,
- a manned shuttle which after separation from the booster moves by its own propulsion to the desired orbit where it may (1) remain in orbit and function as space station for as long as seven days, (2) checkout and launch onboard payloads into the proper orbit to perform their respective missions, and (3) return man and material from orbit to earth,
- an orbit-to-orbit tug which can move a spacecraft with its payload from the orbiting shuttle to a

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higher orbit, including a geosynchronous orbit, and subsequently return such craft to an orbiting shuttle for service, replenishment or for subsequent transfer by the shuttle to earth for more extensive treatment, and

- launch and recovery sites, servicing and refurbishing facilities, command and control systems, etc.

It is important to note that the economies promised by the reuseable STS accrue largely through simplifying the payload and its spacecraft, ensuring proper initial operation through checkout in orbit, by greatly extending the useful life of the payload and spacecraft through resupplying in space or by recovering them for refurbishment, repair, and/or updating on earth. Important economies accrue also from reusing (instead of expending) launch and transport vehicles.

Such a transportation system could markedly influence certain aspects of intelligence gathering. For example:

- Satellites and payloads could be simpler--less constrained by consideration of weight and volume.
- They could be transported to space with less strain; deployed, set in operation and tested in the orbit in which they must function.
- They could subsequently be revisited for retrieval of acquired data or for replenishment of devices previously dispatched; for replenishment of expendables (films, tapes, fuels, propellants, power sources, etc.); for component replacement, or for return to the orbiting space vehicle or to earth for more extensive refurbishment, repair or modification.
- Rapid response to unforeseen political, military or other critical situations would be possible. Sensors could be deployed in a matter of hours, attended by man if appropriate, and returned to the launch base after one orbit, if desired.
- Man could more readily be employed as operator, as direct observer, reporter, decision maker, and when appropriate, to act on decisions made aboard or by others on earth.
- The size and flexibility of the transport vehicles would permit a wide range of utilization--to transport a large spacecraft or several small ones to the desired orbit, or to serve as a short-term manned space station.

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- Launch costs would be considerably reduced, while it is much too early to be precise, we anticipate that a shuttle trip to near earth orbit and return would cost a few million dollars instead of the tens of millions currently spent on expendable launches. Hopefully, launch and other operational costs will be so reduced that we will be able to build and test prototypes before committing to an operational program.

These important returns must, of course, await development of the transportation system and the production of compatible payloads--very costly endeavors. The problem we face today is that of getting authorization and appropriations at levels which enable the country to continue to perform essential space activities and at the same time develop more economical means of carrying out these missions and others which we sense (but cannot prove) will be required in the future.

We welcomed your visit to NASA. Know that we appreciate the support your people give us, and that we stand ready to serve your Agency's needs as we can.

Sincerely yours,



George M. Low  
Deputy Administrator

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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

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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,

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Richard Helms  
Director

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