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19 January 1971

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From: Director, Naval Research Laboratory, Washington, D. C. 20390

To: Director Program "C", (Capt. R. Geiger) PM-16

Subj: POPPY Mission-7107, FY-71 NRL BUDGET Status for Program "C"

Ref: (a) Director Program "C" Memo to Dir. NRL of 30 Dec 70 BYE-66475

(b) Dir. NRO Memo to Dir. Prog. "C" of 17 Dec 70, B-13396-70

(c) Memo Dir. Prog. "C" to Dir. NRO of 5 Nov 70, BYE-66449-70

(d) NRL Ltr to Dir. Program "C" of 1 May 1970, BYE-51904-70

Encl: (1) Analysis of the cost growth of POPPY effort of Program "C"

(2) Cost Control and Managerial Steps taken by NRL to Support Prog "C"

1. Reference (a) forwarded reference (b) to NRL for action and analysis. The memo of reference (b) takes note of the cost growth, recommends immediate emphasis on corrective procedures to reverse present trend of increased cost growth. Attachment to reference (b), addresses the apparent growth in FY-71 of the line items for NRL Salaries and Overhead as well as the one for miscellaneous material, travel and shipment, and requests reasons for the increases. In addition, concern is also expressed about the basic POPPY cost growth and requests assistance in management improvements.

2. NRL is indeed sensitive to these cost growth areas and has taken a number of steps to improve the fiscal and managerial control of its efforts under Program "C". These actions are outlined in enclosure (2). NRL has instituted a comprehensive and detailed review of all factors which lead to the cost growth noted in reference (b). An analysis of the elements of cost growth were outlined and provided in reference (c). In essence the principle factors which led to the unfortunate escalation of costs were:

- a. Price escalation of components
- b. Mission 7106 Failure-Analysis
- c. Redundancy in Spacecraft systems based on Item b, above
- d. Intensified operational requirements

3. NRL is confident that its recent reorganization and its newly instituted managerial review processes which are outlined in enclosure (2) will control unwarranted cost growth in the future. However cost growth associated with a general Civil Service wage increase or with general inflationary increases in component and travel costs will continue to be difficult to anticipate and defray.

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ANALYSIS OF COST GROWTH IN POPPY EFFORT OF PROGRAM "C"

1. Background: Cost Growth by definition, is the "net change of an estimated or actual amount from a base figure previously established" The base for comparison in this case is the actual experienced obligations for FY-70 Program "C" efforts at the Naval Research Laboratory. Since reference (c) has used the 16 month period to up-date and correct the previous estimates for FY-71 submitted by reference (d), the FY-71 comparison may be determined by taking the 16 month reference and subtracting the line items for the last 4 months (EXP.) of FY-70 which were given in enclosure (3) of the reference (c). An explanation of the various elements causing this "Cost Growth" are provided herewith.

2. The 25.5% increase in NRL Salaries and Overhead was identified in reference (b). For the sake of clarity, the basis for this calculation will be given and then followed by an explanation:

7107 (16 Month Estimate .....	\$3388.8K
Last (4 Months FY-70 OBLIGATIONS) ..	<u>-395.0K</u>
7107 (FY-71, 12 month Estimate) ..	2993.4K
Reference Base = FY-70 Obl.....	2388.4K
25.3% Increase over FY-70 ....	\$ 604.7K

a. The largest part of the FY-71 increase in NRL manpower costs for FY-71 is seen in the \$271 K item. See column (1) ref. (c), which did not get committed for Mission 7107 during the last 4 months of FY-70 and therefore must, of necessity, increase the cost and technical burden during the early phases of FY-71. The reason that all of the 7107 work did not proceed on schedule throughout the latter part of FY-70 was the Mission 7106 Failure Analysis. This effort did impose a heavy and unexpected burden on NRL which diverted this \$271 K worth of manpower resources from advance design, engineering and procurements on Mission 7107 back to a study of Mission 7106 Failure. The efforts on Mission 7107 have been carried into FY-71 and will now be accomplished by (1) slight personnel increase, (2) increased use of the per diem labor and/or overtime.

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(b) Another part of the \$604.7 K increase in manpower estimated for FY-71, is the \$119.5 K (see column (5) of ref. (c)), which represents the per diem labor required to provide the additional spacecraft and ground station hardware construction called for by the increased requirement for redundancy and the intensified operational requirements which have been previously explained in more detail in reference (c).

(c) The remaining portion of the \$604.7 K increase in manpower estimated for FY 71, (i.e. \$214.2K) is all in the original FY-71 request of reference (d) and represents an 8.9% increase over FY-70. This increase is largely due to a government salary increase as well as the general increase in overhead. The remainder is for a 4.3% increase in personnel. The \$98.8 K deferred in the FY-71 initial approval is in this category and is still deficit since it was not included in reference (b).

(d) In summary, the 25.3% increase in FY-71 NRL Salaries & Overhead is distributed as follows:

(1) 7107 Effort delayed by Failure Analysis into FY-71 .....	\$271.0K = 11.3%
(2) Recommended Redundancy & Intensified operational requirements .....	\$119.5K = 5.0%
(3) Original FY-71 Increases (ref. (d)):	
Government Raises .....	\$110.6K = 4.6%
Increase in Personnel .....	<u>\$103.6K = 4.3%</u>
TOTAL .....	\$604.7K = 25.3%

3. The explanation for the 30.6% increase in the Miscellaneous Materials and Travel Account for FY-71 relative to FY-70 obligations, is provided as follows:

MISCELLANEOUS MATERIALS & TRAVEL ACCOUNT:

7107 (16 Month Estimate) .....	\$1912.0 K
7107 (4 Month FY-70 Experienced) .....	-150.9 K
7107 (FY-71) .....	<u>\$1761.1 K</u>
7106 (FY-71) .....	+ 20.2 K
TOTAL FY-71 .....	<u>\$1781.3 K</u>
TOTAL FY-70 .....	\$1364.0 K
30.6% Increase Over FY-70 .....	\$ 417.3 K

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a. The largest part of this increase was contained in the original request for FY-71 fiscal support. It represented \$251.8 K (18.4%) more than had been experienced in FY-70 and this was because FY-71 is a "Payload Design and Fabrication" Year as opposed to a "Launch Preparation" Year such as FY-70. In other words during FY-71 NRL would have to provide most of the hardware for Mission 7107 and the Miscellaneous Materials & Travel account would have to be larger than was needed in FY-70.

b. The second largest item is the \$102.2 K (7.5% of FY-70). This amount, as explained in reference (b) is to cover price escalation which has been unusually severe in the aerospace industries. Increases in travel costs, which you have recognized as a part of the rising prices, is also found in this category.

c. The third item is \$63.3 K that we had originally planned to spend on 7107 during the last 4 months of FY-70. It did not get spent on 7107 because of the priority emphasis on the 7106 Failure Analysis and since these purchases still had to be made, this amount had to be added to the FY-71 estimate, for 7107.

In summary the 30.6% increase in the FY-71 Miscellaneous Materials and Travel account is distributed as follows:

(1) Original FY-71 Increase relative to FY-70	=	\$251.8K	=	18.4%
(2) Price Escalation .....		102.2K	=	7.5%
(3) FY-70 Expenses delayed into FY-71 .....		63.3K	=	4.6%
		<u>TOTAL ....</u>		<u>\$417.3K = 30.6%</u>

4. NRL's remaining unfunded deficit:

a. 7106 Failure Analysis - When NRL started the 7106 Failure Analysis in late February 1970, it was not anticipated that the effort would take as long, cost as much or result in as many changes in Mission 7107... both technically and financially. NRL realizes now that the NRO should have been advised earlier, of the growing magnitude of the problem and also requested funds earlier to eliminate a growing deficit funding situation. In the future we will do this. However, we do have a deficit of \$365.5 K in the 7106 account for FY-70 due to the 7106 Failure Analysis and request that it be approved and funded.

b. Also the \$98.8K that was deferred from the initial FY-71 financial approvals, "pending further justification" has been justified further in the paper of reference (c) and repeated to a large extent earlier in this paper. This deficit still remains unfunded even though some of the calculations relative to the cost growth percentages suggest that the intent was to have funded it.

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### COST CONTROL AND MANAGERIAL STEPS TAKEN BY NRL TO SUPPORT PROGRAM "C"

1. In order to improve both Fiscal and Managerial control of its efforts under Director, Program "C" and at the same time consolidate the internal NRL organization into a more orderly grouping relative to sponsoring activity and field of endeavor, the Naval Research Laboratory has taken the following steps:

a. **ORGANIZATIONAL:** An Associate Director for Space Science and Technology has been established under  (Acting). Under this a new Division (Space Systems) has been formed so that the work in the Spacecraft and in the ELINT Payload are in the same line organization for the first time in the Program "C" effort. Mr. H. O. Lorenzen will be the Superintendent of this new Division. The reorganization is extensive beyond its Program "C" implications and will assist in the development of many new aspects of NRL cooperative teamwork in the Space Arena.

b. **PROCEDURAL CHANGES:** In November the Director of NRL requested that monthly status reports be given on the second Thursday of each month so that critical areas of performance, schedule and cost experience would be identified before they reach crisis proportions. These monthly status reports will be the basis for the reports to Director Program "C" and Director NRQ which are now being requested.

c. **STAFFING CHANGES:**

(1) The ELINT (Payload) group under Mr. Mayo will be elevated to Branch status and will be strengthened by (a) conversion of certain key Contractor personnel to Civil Service, (b) addition of an Administrative Assistant, (c) establishing four strong, functional Sections under Mr. Mayo's leadership so that the management of this effort will have added depth.

(2) The Satellite Techniques Branch under Mr. Wilhelm, and the Payload group under Mr. Mayo will now be in the same Division. Four or five engineers will be added to Satellite Techniques Branch. Until clearances are obtained they will only be able to work on the unclassified portions of the program. Added technical depth and managerial support is being developed.

(3) A part-time Systems Analysis Team is being assembled from the Space oriented groups within the Naval Research Laboratory, so that the best technical minds within the entire NRL family can be assembled to provide a technical body for study and analysis of problems associated with POPPY or Program "C". The present thinking is for them to be available on call about 25% of the time. Several are awaiting clearance.

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(4) A Program "C" management office will be established effective 15 February 1971. Personnel for this office have been identified. The office will be led by Mr. Edgar Dix and he will be assisted by [redacted] who is currently awaiting clearance. This office will have the responsibility for producing consolidated monthly financial statements in a form compatible with NRO requirements, for maintaining pert diagrams for the satellite development cycle, for identifying critical paths in the support and procurement efforts, for documenting system software and for establishing an effective interface with both NRL and PM-16 management. The program office will be attached administratively to Mr. Lorenzen.

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