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NRL SPECIAL PROJECTS CONTROL NO.

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(When filled in)

NRL B-000123-70

DATE: 2 Oct 1970

ORIGINATOR	SERIAL NO.	ENCLOSURES
MANAGER, PROGRAM C	BYE-66424/70	

DATE REC'D IN NRL	COPIES REC'D	COPY NOS.	RECEIPT NUMBER
9 Oct 1970	One	#4	TR-907/70

SUBJECT

POPPY Technical Operations Group (TOG) Meeting; report of

D.50

ROUTE TO	*	COPY NO.	WITH ENCLS.	SIGNATURE	DATE OUT	DATE RETURNED	ROUTE TO	*	COPY NO.	WITH ENCLS.	SIGNATURE	DATE OUT	DATE RETURNED
1000					10/12								
4000													
5614													
5170													
1100													

RETURN THIS ROUTE SLIP TO NRL SPECIAL PROJECTS OFFICE, ROOM 222, BLDG. 43.
DO NOT ROUTE TO OTHER SECTION OR BRANCH.

* SYMBOL A-ACTION C-COMMENT I-INFORMATION R-RETAIN COPY E-EVALUATION	ACTION TAKEN BY	DESTRUCTION REPORT NO.	FINISHED FILE
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NRL CONTROL RECORD NDW-NRL-5216/1005 (11-67)

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CONTROL NO. BYE-6642 4/70

Copy 4 of 10

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	SIGNATURE	DATE	TIME	DATE	TIME	NAME & OFFICE SYMBOL	DATE
NRL							

Handle Via Indicated Controls

BYEMAN

Access to this document will be restricted to those persons cleared for the specific projects;

~~EARPOP~~

....

....

WARNING

This document contains information affecting the national security of the United States within the meaning of the espionage laws U. S. Code Title 18, Sections 793 and 794. The law prohibits its transmission or the revelation of its contents in any manner to an unauthorized person, as well as its use in any manner prejudicial to the safety or interest of the United States or for the benefit of any foreign government to the detriment of the United States. It is to be seen only by personnel especially indoctrinated and authorized to receive information in the designated control channels. Its security must be maintained in accordance with regulations pertaining to BYEMAN Control System.

NRL B-000123-70
TR-907/70

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GROUP 1
Excluded from automatic downgrading and declassification

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DEPARTMENT OF THE NAVY
NAVAL INTELLIGENCE COMMAND
2461 EISENHOWER AVENUE
ALEXANDRIA, VA. 22314

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IN REPLY REFER TO
NIC-2Q/djb
BYE-66424/70

8 OCT 1970

~~TOP SECRET EARPOP~~
HANDLE VIA BYEMAN CONTROL SYSTEM

From: Manager, Program "C"
To: Distribution List

Subj: POPPY Technical Operations Group (TOG) Meeting; report of

Encl: (1) TOG Agenda

1. A TOG meeting was held at 0930, 24 September 1970 in the Hoffman Building. Following is the list of attendees:

[redacted]	Program Manager
MR. DIX	Program Manager's Office
MR. MAYO	Program Manager's Office/NRL
CDR OLSON	NRL
LTJG MORGAN	NSG
[redacted]	NSG
	NRO
	NRO
	NRO
MR. ANDERSON	ASA
[redacted]	CIA
	CIA
MR. ABPLANALP	NSA
[redacted]	NSA
	NSA
	NAVSTIC
	NAVSTIC
	NAVSTIC

2. Enclosure (1) is a copy of the agenda. Following is a summary of the discussion:

a. (#1) DEPSECDEF Packard has approved augmentation of the [redacted] for Ocean Surveillance and an additional site at [redacted] The SEL-86 computer will be installed at [redacted] first and then at [redacted] and

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C05026157
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[redacted] A speed up of these installations is now under study. NRO will fund this augmentation except for the MILCON required at [redacted] which will be service funded. Manning of the new and augmented sites was discussed. NSA and NSG are coordinating the manning problems.

b. (#2) POPPY operations at [redacted] were terminated on 15 August 1970. Eighteen tons of equipment have been packed and shipped to NRL. All Program cleared personnel have been debriefed.

[redacted]

d. (#4) Decisions of the Spacing Working Group were explained. Copies of the implementing message and the new message formats were distributed (Reindeer 26/41). NRO, with the agreement of NRL, NSG, NSA and the Program Manager's Office, has set the maximum and minimum limits of POPPY [redacted] will be regularly reported and after approval of all concerned NRL will initiate thrusting to maintain [redacted] within the prescribed limits.

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e. (#5) Operational status:

(1) 7106B. Unable to command.

7106D. Unable to command.

Remaining satellites operating with minor discrepancies.

(2) [redacted] construction is on schedule, the building should be completed in November/December. An NRL team is standing-by to go to [redacted] for equipment installation. [redacted] construction is also on schedule, the building should be completed in December/January. The NRL team will go to [redacted] about mid-January. The [redacted] CINC's are returning for briefings at NRL, NSG and HRB SINGER.

(3) [redacted] has been taking advantage of "target of opportunity tasking" (TOOT): SLX has been used on the [redacted] seven times, on the [redacted] six times and the [redacted] has been used frequently on the DOG HOUSE signal.

(4) "Generalized Ocean Surveillance Tasking" is now routine at [redacted] During a recent period continuous tracking was maintained on eighteen major combatants through 120 reports and 133 locations. Location reports have been getting out in just under 2 hours.

(5) The [redacted] receivers are down until about 1 October to provide material for [redacted] The training/flight evaluation computer installation has been completed and the computer is in use.

f. (#6) Program Review Follow-up:

(1) (tailored tasking). NRO will schedule a meeting to consider tasking tailored for each ground station.

(2) (NSA band request). NRL reports the following band coverage for 7107:

dual coverage
to 10.5 GHZ
14.5 - 14.8 GHZ
14.8 - 15.1 GHZ

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C05026157
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single coverage
12.4 - 14.5 GHZ
17 - 18 GHZ
10.5 - 12.5 GHZ (on order, delivery may be late)

(3) (7107 tasking estimate). NRO and NRL are studying the tasking requirements and are planning special tasking groups that will allow the ground site to set various modes of operation with just a single command. Further meetings of NRO and NRL are scheduled as well as meetings with NSA.

(4) (pulse-to-pulse frequency measurement). NSA will schedule meetings on this subject with NRL and will also study uses for the third transmitter of 7107.

(5) (PW measurement option). This is under study by NRL and the group is looking at tasking estimates.

g. Other items discussed:

(1) An interim report on the failure of 7106 B/D will be completed in about one week.

(2) NRL desires to be included as an info addee on all messages relating to malfunctions.

(3) NSA reports that five [redacted] ELT's are being prepared on the basis of POPPY intercepts from [redacted]

(4) NSA and NRL are working on a dynamic-thresholder to improve location capability.

(5) NSA is interested in all developments related to Quality-Control, the SEL-86 computer and the Perishable Data Extractor.

(6) [redacted] was introduced, he will be working with [redacted] of the NRO.

[redacted]

Distribution:
(see page 5 of 5)

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Distribution: (con't)
COMNAVSECGRU (Attn: G-54)
Director NRL
NRO (Attn: [redacted]
NSA (K4/SPO)
CIA (OEL/GSD, Attn: [redacted]
ASA HDQTRS
NAVSTIC (Attn: [redacted]

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TOG AGENDA

0930, 24 September 1970

Hoffman Building

1. Status of augmentation proposal. (NIC)
2. [redacted] (ASA)
3. Site. (CIA)
4. Spacing Working Group meeting. (NRL)
5. Operational status report. (NRL, NSG)
6. Program Review follow-up. (NIC)

Enclosure

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OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

~~CONFIDENTIAL~~

TO : Co [redacted]
~~Secret~~

5605-102:FW:cdd
DATE: 8 October 1970

FROM : Code 5604A

SUBJECT: Interim Systems Analysis Group, Program C; suggested tasks for

Ref: (a) E. L. Dix memo of 2 Oct 70 on same subj.

1. Reference (a) performs a useful and timely service; we have so much to do that the sooner we decide how to use this group and get them productive the better. For what they may be worth, I would like to submit a few comments on the Dix memo.

2. Before any effort on present system improvement goes very far, it seems to me we have to decide (or get OPNAV and maybe others, too, to decide) what sort of program improvements could best be time-phased with improvements in end-product utilization (i.e., better capabilities in transmission and in actual employment of the product). We all need updating on recent progress (?) in IDHS, OSIS, Command & Control, etc.

3. An item like Dix's 2.e we should be able to handle faster and better with regular program personnel--not this new group. Maybe 3.c is in the same category; in any case 3.c needs early attention.

4. Subparagraph 3.g needs discussion in private (Dix, Mayo, you and I at first).

5. As regards 3.h, I'm sure we could easily arrange to get the info, but we should review the material from the OPNAV Ocean Surveillance Coordinating Committee first.

6. Item under 3.i we could look at from technical standpoint, but otherwise it's not under our purview.

7. Concur in desirability of meeting at an early date.

[redacted]

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5614

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5010-108

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

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MEMORANDUM FOR DIRECTOR PROGRAM "C" 7 October 1970

Statement of NRL/NSA interface on Second Generation Computer effort:

1- When the 17 August letter to NRO is approved the Program "C" forces, primarily NRL, will be committed to a very ambitious effort with little luxury for continuance of the debate already joined relative to the influence of NRL and NSA in this overall effort. We at NRL submit that our continuity of technical effort is responsible for the program capability which is now about to be augmented and we use this as evidence of our ability to produce the improvements now stated in the 17 August letter to NRO. Consider the opposition along this path thus far exibited by the NSA team...all along it has been either Low Cost or No cost alternatives which were being submitted from this quarter another SEL 810 would not greatly challenge them in production, accuracy or impact on the Tactical world of improved End-Product. However with the realization that we were offering 40 to 50 times as much producivity with a computer system only costing $125K more than the old one they sincerely believe themselves to be in some jeopardy if this goes the same route that the SEL 810 went 4 years ago...with NSA deliberate neglect until it showed some operational capability and then they condescended to offer some guidance as to the priorities used by the system.

2- Jurisdictionally NSA has the perogative of imposing their will on the Overseas Processing but it is about ten years late to get in on the ground floor in this act in this program. They abandoned the opportunity/in the first computer procurement and deployment effort when they argued that "this was an effort to Move NSA overseas & this had been tried many times before with little if any success...it just would not work." Now once again we come full cycle, NSA arguing that the SEL-86 is not needed, just another small, VERY Small STEP forward so the Competition can overtake this Program which is such HARD WORK at NSA. It must be very embarassing to NSA to realize that the same data goes to the computer in [redacted] and in their basement and the differences in productivity and timeliness are not indicative of the difficulties costs for the two processing efforts. I know that their aims are different and do not suggest that they be the same. I just submit that the progress in Processing for Program "C" is so neglected, ~~that~~ The limitations of four or five years ago are still imposed ~~and no promise of~~ [redacted] sight. They are complacent and will not even discuss imp[redacted]or the basic reason that they do not want to perpetuate the source of this data any longer than possible.

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C05026157
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Their neglect of the basic improvements which are being built in to [redacted] for improving this program is a case in point. Let us look at the record of utilization of Mission 7106; In Nov 69 the full disclosure of the processing techniques for both NSA and on-site were made to the SOC team in the basement of Pentagon. This study was to determine the extent to which Program "C" might be utilized in the EOB arena when the main EOB producer was suddenly lost and no other program was a main contender to pick up the capability. EOB is one of the major areans where further exploitation can be made in Program "C" data processing. Just because NSA's software algorithims only isolate and automatically locate [redacted] and a couple other regular 360° scanning high power emitters, this is by no means the limitation of Program "C" Capability as exhibited by the data analysis of [redacted] EOB against selected emitter families can be done by the forward areas if the job is tailored to the machine and manning at each site. It is too big a job to be imposed in-total on the sites for all time. But in the context that Program C could be exploited in crisis times or to fill a critical need, EOB certainly could be done by these sites.

The rediculous restraint that NSA has imposed on using adjacent pulse widths is almost unbelievable because it stems from an error in the way they have equipped their particular "Playback" magnetic tape systems...they modified their recorder systems along with the collection sites in 1965 or 67 and then at some time later they took out this "Dual Bandwidth" modification (just removed two plug-ins from each channel of their Playback system. This did reduce their frequency response so that resolving the differences between W,X,Y,&Z is extremely difficult. Nevertheless this 4-pulse width modulation was widely accepted at NSA before the launch of Mission 7106, to the extent that they assigned the particular widths to all the collection systems, with a dialog to NRL. This restraint just cuts the capability of the Mission 7106 spacecraft in Half, but it does make their processing load a little less dense and life a little easier for their people. I may be cynical but are we really in this effort to make their life easier, certainly not if the effort justified by the results. USIB guidance toward "Associative Processing" where the known parameters of all elements of a Weapon System are simultaneously compared against all the other emitters which are being radiated and received through the ELINT collection syste[redacted] the new emitters will be assigned their weapon system role at [redacted]est possible time and changes in the capability of weapons systems will be recognized at the earliest time.

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Associative Processi[ng] ... been given the time of Day for Program "C" thu [redacted] being considered for [redacted]

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The entire purpose of all this is to establish that NSA has a mess in their own house to clean up and set right before Program "C" should expect any significant Help in the on-site processing arena. To date they are only generally knowledgable of the on-site processing techniques, and by weight of their recent arguments against the procurement of the System 86 computer it is easier to believe they would rather scuttle the effort than lend any constructive expertise.

3- So much for the thearpy of my personal concerns, now on to the facts as they stand today. By virtue of their charter for Processing they must be "Informed" in a realistic and timely manner on this effort but on the other hand the technical program must not be inhibited by their presence. The contractor staff must take their orders from the Scientific Officer on their contract so that the guidance is clear, and unambiguitious. There is some danger that the contractor staff may be inhibited in free exchange of ideas with a third party present. The information flow in the design arena must be substantially unrestrained so it will be necessary to carefully select the interface individuals so that the condescending and sneering attitudes of the past will be eliminated in the assessment/during the various design review opportunities in this effort. The schedule for Computer Selection and procurement is being included in this memorandum for your consideration and if it meets with your approval it can be implemented. Total System definition and design philosophy for the PDE is now underway and will be forwarded within the next three weeks. There are several large philosophic issues in the PDE designs which must be resolved before it proceeds.

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Budget Deficit for 7107 - lot FY-70

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BASIC PROBLEM

USIB REQUIREMENT -- 10 NM/24hr.--6 hr reporting

NAVY OCEAN SURVEILLANCE (General): WEIGHT

A. Ship Location within 500 nm of US ship...2

B. Mediterranean, Tonkin Gulf, North/Norwegian/Barents Sea of Japan........$\geq$.2
GI/UK Gap

C. Political Climate (Tension)...........$\geq$.1

D. Any Missile Carrying Craft..............$\geq$.2

$\geq$0.7

10 NM or Less Location Acc.
(1 Hr reporting time).

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Byе 059322-?

CART #1 Enclosure (?)

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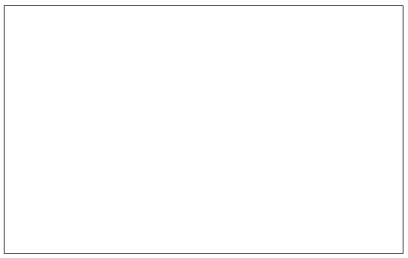
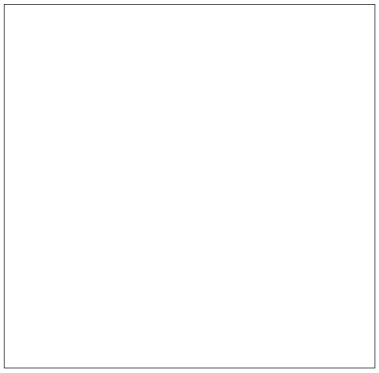
__PRIMARY RADARS__



All Surface Search
a.Circularly Scanning
b.High Power

etc.

..Secondary Radars..



All have various roles
a. Sector Scanners
b. Low & High Power

etc.

CHART 32

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.....HYBRID R&D SPACECRAFT SYSTEMS.....

1. Use Features of both [redacted] & Monopulse DF.
2. [redacted] Provides:
   A- High Accuracy [redacted] on 1 min. intercepts.
   B- High Search Time, 1-4 Hrs over hi.interest areas.

3. Monopulse DF provides:
   A-Side Lobe Search.
   B-Resolves Ambiguities on [redacted]
   C-De-Cluttering on Hi-Sensitivty system.

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TOP SECRET [redacted]

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Monopulse DF System Design Goals:

1. 600 NM Circular Intercept Area.
2. 2650 MHz to 2850mhz coverage
3. Monopulse Accuracy 1°
4. Transpond System
5. PRF Sorting in the spacecraft for desired signal
6. Improve [redacted] accuracy

[redacted]

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Chart #6
Enclosure (1)

[redacted]

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17 August 70 Ltr of Program Augmentation for Ocean Surveillance:

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1. [redacted]ts in Spacecraft NOI solely for Ocean Surveillance but enhance total impact of program:
   A- Increased timliness of response to user.
   B- Greater use of the X-Band possible.
   C- [redacted] emitter now matched to Band #8 of 7107A/B.
2. SEL-86 Systems for Pacific can both be programmed for FY-73, 6 mo. apart.
3. [redacted] will remain primarily an In-Flight Evaluation site. Some Operational Commands can originate here, but not all visible.

[redacted] should have its own interrogation capability to be selfsupporting.

Change #2

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ARCHITECTURE CHANGES IN MISSION 7107
to enhance Ocean Surveillance:

1. Complete Frequency Coverage to 18 GHz. -
2. Geopositioning capability extended to K_u Band.
3. 4-Way Coverage of Shipborne spectrum.
   a-Improves time over target.
   b-Allows intercept of Total Weapon System.
4. Band #8 raised 40 MHz to embrace HEAD NET.
5. Comb-Filter in X-Band.

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Chapter 8
Enclosure (1)

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1 OCT 70

ELINT COVERAGE PROPOSED FOR MISSION 7107 (QRC-24)

Band No.	Spacecraft 7107A & B	Band No.	Spacecraft 7107C & D
TOP SECRET	-165 MHz	1	200-350 MHz
2	165-200	2	350-450
3	550-815	3	450-550
4	815-970	4	815-970
5	1800-2100	5	970-1205
6	2100-2580	6	1205-1800
7	2580-2680	7	2100-2580
8	2680-2840	8	2680-2930
9	2840-2930	9	6400-6725
10	2930-3120	10	6700-7900
11	3120-3300	11	7900-8600
12	3300-3600	12	8600-9100
13	3600-4050	13	9100-9340
14	4050-4850	14	9340-9400
15	4850-5250	15	9400-9600
16	5250-5850	16	9600-10,500
17	5850-6725	17	(C) 10.5-12.5 GHz * (D) 15.0-16.0 GHZ *
18	(A) 17.0-18.0 GHZ (B) 12.5-14.5 GHZ	18	14.5-14.8 GHz
19	9.2-9.6 GHZ CHANNELIZED	19	14.8-15.1 GHZ
		20	(D) 16.0-17.0 *
		21	35 GHZ

CHART #9
Enclosure (1)

* Based on availability.

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INCREASED OPERATIONAL REQUIREMENTS

1- PAYLOAD:

A. Electronic Equipment

1. Band Extension . . . . $220.0 K
2. Parametric Measurement Improvement. 155.0
3. K_u- Band Geopositioning 40.0
4. Ranging System 80.0

B. Control Systems

1. 160 Commands . . . . . .$45.0 K

C. NRL Salaries & Overhead. .$44.5 K

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II - GROUND STATION:

A. Electronics
1. QC/Manual Analysis. . $126.0 K
2. Systems Calibration . 25.0

B. Antenna
1. Systems Calibration . $ 20.0 K

C. NRL Salaries & Overhead
1. Per diem Labor . . . .$ 30.0 K

D. A-to-D Systems
1. [redacted] A/DDS. .$140.6 K
2. PDE with PRF Selection 185.0 K

Total $526.6 K

III - SERVICES:

B. Computer services
1. Ephemeris (NWL). . . .$ 65.0 K

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I - PAYLOAD:

A. Electronic Equipment

1. Downward Looking DF. . .	$255.0 K
2. L,S,& X-Band [redacted] . .	80.0
3. S-Band Comb-Filter . . .	75.0
4. Hi-Accur. Attitude Sensing	170.0
5. Basic TM/DL Data	205.0
	$785.0 K

B. Stabilization Systems

1. Hi-Accur. Attitude Control	$265.0 K
2. Electric ARC Thruster. . .	105.0
3. Gravity Gradient Boom and Dampers.	40.0
	$410.0 K

C. Control Systems

1. Stored Command System. .	$135.0 K

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CHART #12
Enclosure (1)

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II - GROUND STATION SYSTEMS FOR R&D PAYLOAD

A. Monitor & Record Command Status.. $232.0 K

III - FACILITIES @ NRL FOR R&D PAYLOAD

A. Anechoic Chamber Modifications....$230.0 K

B. Magnetic & Optical Alignment..... 60.0

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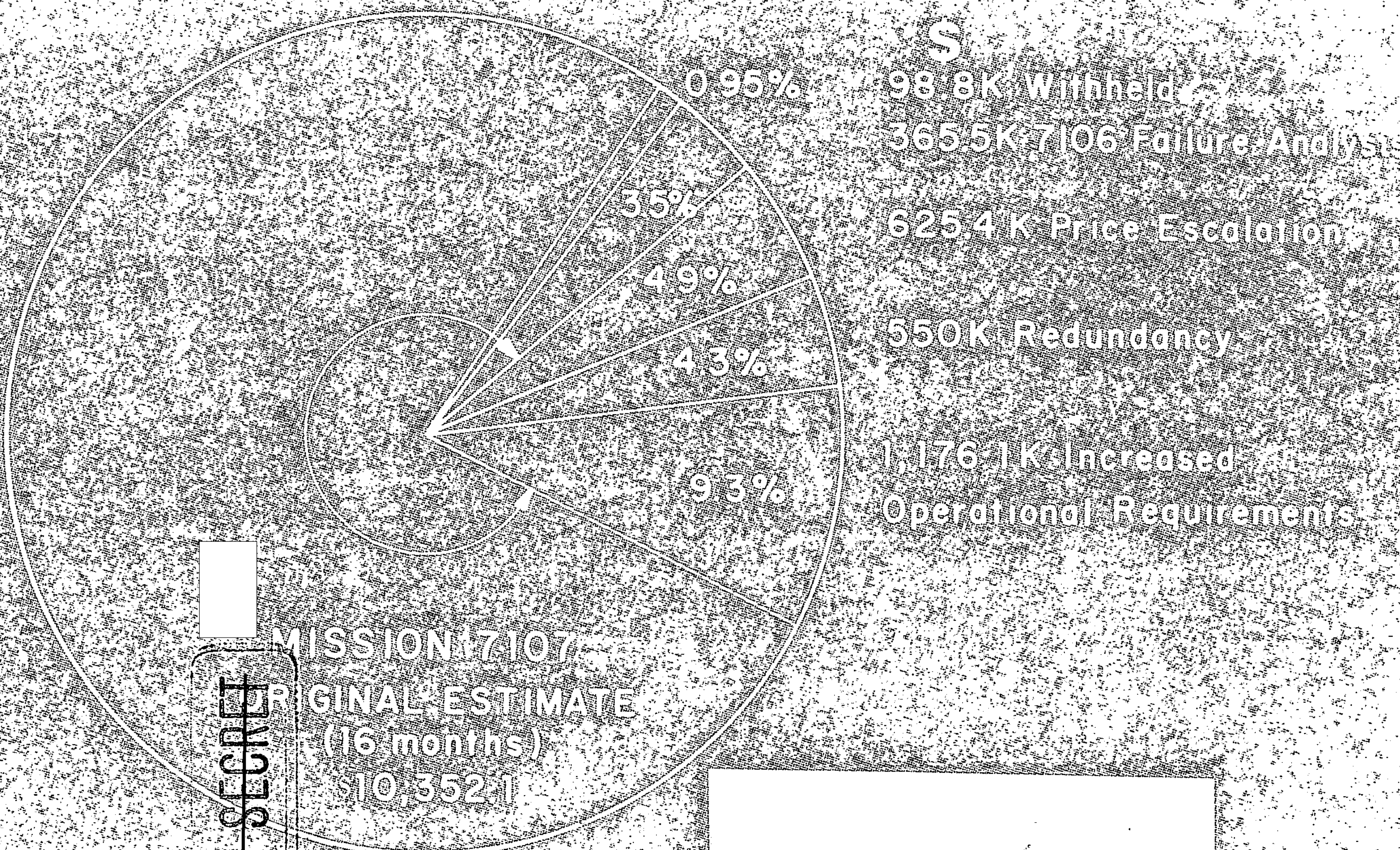

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CHART #14
Enclosure(1)

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SUMMARY OF MISSION 7107 Financial Status

1.	Original Budget Estimate (16 Mo)...	$10,352.1 K
2.	Inflation.....	625.4
3.	Redundancy & Reliability.....	550.0
4.	Increased Operational Requirements.	1,176.1
5.	New Estimate (NO R&D P/L) (16 Mo)..	12,703.6 K
6.	R&D Payload.....	2,062.0
7.	New Estimate (with R&D P/L)(16Mo)..	$14,765.6 K

FUNDS FOR MISSION 7107

8.	FY-70 (4 Months).....	$ 2,754.7 K
9.	7106 Failure Analysis.....	-365.5
10.	Last 4 Month FY-70 costs for 7107...	$2,389.2 K
11.	[redacted]7 portion of MIPR #FY7616-71-0031..	7498.6 K
		$9,887.8 K

CHANGE #15
Enclosure (6)

TOP SECRET

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HANDLE VIA BYEMAN
CONTROL SYSTEM ONLY

NAVAL RESEARCH LABORATORY FINANCIAL PROGRAM
DEFICIT FOR MISSION 7107

1. With R&D P/L	2. Without R&D P/L
$14,765.6 K	$12,703.6K
- 9,887.8	- 9,887.8
$ 4,877.8 K	$ 2,815.8 K

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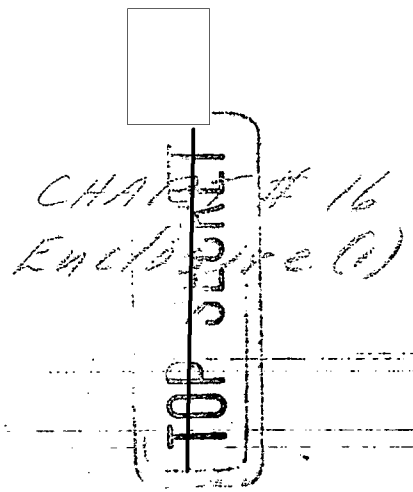

CHART # 16
Enclosure (2)

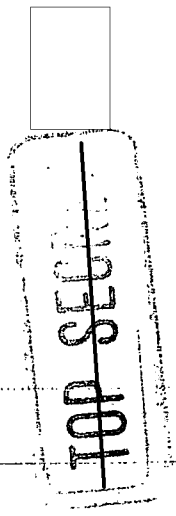

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TABLE I

	7106 FAILURE ANALYSIS (1)	PRICE ESCALATION (2)	RECOMMED REDUND-ANCY (3)	INCREASED OPER. REQ. (4)	BASIC 7107 COST INCREASE (5)	ORIGINAL ESTIMATE (16 MO.) (6)	NEW ESTIMATE (NO R&D) (7)	R&D PAYLOAD (8)	NEW ESTIMATE (WITH R&D) (9)
I. PAYLOAD (DEVEL.-RECUR.)									
A. Electr. Equip. (Data & T.M.)	---	$ 174.6	$ 155.0	$ 495.0	$ 824.6	$ 1,754.5	$ 2,579.1	$ 785.0	$ 3,364.1
B. Stabilization Systems	---	142.0	130.0	---	272.0	383.5	655.5	410.0	1,065.5
C. Power Systems	---	31.9	95.0	---	126.9	154.8	281.7	60.0	341.7
D. Control Systems	---	61.2	125.0	45.0	231.2	310.4	541.6	135.0	676.6
E. Compat. & Envir. Tests	$ 15.0	---	---	---	---	157.0	157.0	10.0	167.0
F. Mech. Struct. & Fab.	---	9.8	---	---	9.8	282.0	291.8	20.0	311.8
G. NRL Salaries & O.H.	256.0	---	45.0	44.5	89.5	2,385.2	2,474.7	80.0	2,554.7
H. Misc. Mat., Travel & Shpmt.	15.0	68.0	---	---	68.0	1,123.0	1,191.0	40.0	1,231.0
	$ 286.0K	$ 487.5K	$ 550.0K	$584.5K	$1622.0K	$ 6,550.4K	$ 8,172.4K	$1540.0K	$ 9,712.4K
II. GROUND STATION (INVESTMENT)									
A. Electronics (Rec.Rec.&Time)	$ 25.0	$ 31.0	---	$ 151.0	$ 182.0	$ 621.0	$ 803.0	$ 232.0	$ 1,035.0
B. Antenna Systems	---	2.7	---	20.0	22.7	63.2	85.9	---	85.9
C. NRL Salaries & O.H.	15.0	---	---	30.0	30.0	883.7	913.7	---	913.7
D. Misc. Mat.,Travel & Shpmt.	24.5	34.2	---	---	34.2	686.8	721.0	---	721.0
E. A - to - D Systems	---	---	---	325.6	325.6	---	325.6	---	325.6
	$ 64.5K	$ 67.9K	---	$ 526.6K	$ 594.5K	$ 2,254.7K	$ 2,849.2K	$ 232.0K	$ 3,081.2K
III. FACILITIES (INVESTMENT)									
A. Test Equip. & Facilities	$ 15.0	---	---	---	---	$ 573.0	$ 573.0	$ 290.0	$ 863.0
	$ 15.0K	---	---	---	---	$ 573.0K	$ 573.0K	$ 290.0	$ 863.0
IV. SEF[illegible] OPERATIONAL)									
A. [illegible] Field Ass't	---	$ 70.0	---	---	$ 70.0	$ 715.0	$ 785.0	---	$ 785.0
B. [illegible] Services	---	---	---	$ 65.0	$ 65.0	$ 259.0	$ 324.0	---	$ 324.0
	$ ---	$ 70.0	---	$ 65.0	$ 135.0K	$ 974.0K	$ 1,109.0K	---	$ 1,109.0K
	$ 365.5K	$ 625.4K	$ 550.0K	$1,176.1K	$2,351.5K	$10,352.1K	$12,703.6K	$2,062.0K	$14,765.6K

Enclosure (2)

TOP SECRET

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TABLE - A -

~~TOP SECRET~~
HANDLE VIA BYEMAN CONTROL SYSTEM

Enclosure (3)

	Last 4 Months of FY-70			
	Reference (a) Estimated		Experienced	
	7106	7107	7106	7107
I. PAYLOAD (Dev r)				
A. Electr. Equip. (Date&TM)	----	1558.8	-----	1533.4
B. Stabil. Systems	----	135.0	-----	125.0
C. Power Systems	----	-----	-----	------
D. Control Systems	----	172.0	-----	------
E. Compat & Envir Tests	----	----	15.0	------
F. Mech. Struct & Fab.	----	9.0	-----	9.0
G. NRL Salaries and OH	84.0	595.7	340.0	395.0
H. Misc. Mat. Travel & Shpmt	65.0	194.2	80.0	150.9
	149.0K	2664.7K	435.0K	2213.3K
II. GROUND STATION (Investment)				
A. Electronics (Rec. Record & Timing)	50.0	----	75.0	----
B. Antenna Systems	-----	----	------	----
C. NRL Salaries	135.0	70.0	150.0	----
D. Misc. Mat Travel & Shpmt	65.5	20.0	90.0	----
E. A-D Systems	100.0	----	100.0	----
	350.5K	90.0K	415.0K	----
III. FACILITIES (Investment)				
A. Test Equip. & facilities	---	----	15.0	----
	---	----	15.0K	----
IV. SERVICES (operational)				
A. Operational Field Ass't.	100.0	---	100.0	---
B. Computer Services	50.0	---	50.0	---
	150.0k	---	150.0K	---
CARRYOVER.	----	---	-----	(175.9K)
	649.5	2754.7	1015.0	2389.2
TOTALS =	3404.2K		3404.2K	

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BASIC PROBLEM

USIB REQUIREMENT -- 10 NM/24hr.--6 hr reporting

NAVY OCEAN SURVEILLANCE (General):	WEIGHT
A. Ship Location within 500 nm of US ship	≥.2
B. Mediterranean, Tonkin Gulf, North/ Norwegian/Barents Sea of Japan/ GI/UK Gap	≥.2
C. Political Climate (Tension)	≥.1
D. Any Missile Carrying Craft	≥.2
10 NM or Less Location Acc. (1 Hr reporting time).	≥0.7

HANDLE VIA
~~TALENT KEYHOLE~~
CONTROL SYSTEMS JOINTLY

HANDLE VIA
BYEMAN
CONTROL SYSTEM ONLY

Chart #1
Enclosure (1)

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__PRIMARY RADARS__

All Surface Search
a.Circularly Scanning
b.High Power

etc.

..Secondary Radars..

All have various roles
a. Sector Scanners
b. Low & High Power

etc.

HANDLE VIA
~~TALENT-KEYHOLE~~
CONTROL SYSTEMS JOINTLY

~~SECRET~~

HANDLE VIA
[illegible]MAN
CONTROL SYSTEM ONLY

CHART #2
Enclosure (c)

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~~SECRET~~ [redacted]

.....HYBRID R&D SPACECRAFT SYSTEMS.....

1. Use Features of both [redacted] & Monopulse DF.
2. TDOA Provides: [redacted]
   A- High Accuracy, [redacted] on 1 min. intercepts.
   B- High Search Time, 1-4 Hrs over hi.interest areas.
3. Monopulse DF provides:
   A-Side Lobe Search.
   B-Resolves Ambiguities on [redacted]
   C-De-Cluttering on Hi-Sensitivty system.

[redacted] ~~SECRET~~

HANDLE VIA ~~TALENT KEYHOLE~~ CONTROL SYSTEMS JOINTLY

HANDLE VIA [redacted] CONTROL SYSTEM ONLY

Enclosure (1)
Charts

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Monopulse DF System Design Goals:

1. 600 NM Circular Intercept Area.
2. 2650 MHz to 2850mhz coverage
3. Monopulse Accuracy 1°
4. Transpond System
5. PRF Sorting in the spacecraft for desired signal
6. Improve [redacted] accuracy

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HANDLE VIA
~~TALENT KEYHOLE~~
CONTROL SYSTEMS JOINTLY

HANDLE VIA
[redacted] ONLY

Chart # 6
Enclosure (1)

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1 OCT 70

~~SECRET~~ [redacted]

17 August Ltr of Program Augmentation for Ocean Surveillance:

1. Improvements in Spacecraft NOI solely for Ocean Surveillance but enhance total impact of program:
   - A- Increased timliness of response to user.
   - B- Greater use of the X-Band possible.
   - C- [redacted] emitter now matched to Band #8 of 7107A/B.
2. SEL-86 Systems for Pacific can both be programmed for FY-73, 6 mo. apart.
3. [redacted] will remain primarily an In-Flight Evaluation site. Some Operational Commands can originate here, but not all visible.

[redacted] should have its own interrogation capability to be selfsupporting.

~~SECRET~~ [redacted]

HANDLE VIA TALENT-KEYHOLE CONTROL SYSTEMS JOINTLY

CHART #7
Enclosure (1)

[redacted] VIA [redacted] ONLY

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ARCHITECTURE CHANGES IN MISSION 7107
to enhance Ocean Surveillance:

1. Complete Frequency Coverage to 18 GHz.
2. Geopositioning capability extended to K_u Band.
3. 4-Way Coverage of Shipborne spectrum.
   a-Improves time over target.
   b-Allows intercept of Total Weapon System.
4. Band #8 raised 40 MHz to embrace HEAD NET.
5. Comb-Filter in X-Band.

CHART #8

Enclosure (1)

TALENT KEYHOLE
CONTROL SYSTEMS JOINTLY
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ELINT COVERAGE PROPOSED FOR MISSION 7107 (QRC-24)

Band No.	Spacecraft 7107A & B	Band No.	Spacecraft 7107C & D
1	154-165 MHz	1	200-350 MHz
2	165-200	2	350-450
3	550-815	3	450-550
4	815-970	4	815-970
5	1800-2100	5	970-1205
6	2100-2580	6	1205-1800
7	2580-2680	7	2100-2580
8	2680-2840	8	2680-2930
9	2840-2930	9	6400-6725
10	2930-3120	10	6700-7900
11	3120-3300	11	7900-8600
12	3300-3600	12	8600-9100
13	3600-4050	13	9100-9340
14	4050-4850	14	9340-9400
15	4850-5250	15	9400-9600
16	5250-5850	16	9600-10,500
17	5850-6725	17	(C) 10.5-12.5 GHz * (D) 15.0-16.0 GHZ *
18	(A) 17.0-18.0 GHZ (B) 12.5-14.5 GHZ	18	14.5-14.8 GHz
19	9.2-9.6 GHZ CHANNELIZED	19	14.8-15.1 GHZ
		20	(D) 16.0-17.0 *
		21	35 GHZ

CHART #9
Enclosure (1)

* Based on availability.

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~~TALENT-KEYHOLE~~ CONTROL SYSTEMS JOINTLY

[illegible] ONLY

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INCREASED OPERATIONAL REQUIREMENTS

1- PAYLOAD:

A. Electronic Equipment

1. Band Extension	$220.0 K
2. Parametric Measurement Improvement.	155.0
3. K_u- Band Geopositioning	40.0
4. Ranging System	80.0

B. Control Systems

1. 160 Commands	$45.0 K

C. NRL Salaries & Overhead. . $44.5 K

HANDLE VIA
~~TALENT-KEYHOLE~~
CONTROL SYSTEMS JOINTLY

CHART #10
Enclosure (1)

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[redacted]

II - GROUND STATION:

A. Electronics
  1. QC/Manual Analysis. . $126.0 K
  2. Systems Calibration . 25.0

B. Antenna
  1. Systems Calibration . $ 20.0 K

C. NRL Salaries & Overhead
  1. Per diem Labor . . . .$ 30.0 K

D. A-to-D Systems
  1. [redacted] A/DDS. .$140.6 K
  2. PDE with PRF Selection 185.0 K

Total $526.6 K

III - SERVICES:

B. Computer services
  1. Ephemeris (NWL). . . .$ 65.0 K

[redacted]

CHART # II
Enclosure (1)

HANDLE VIA
~~TALENT-KEYHOLE~~
CONTROL SYSTEMS JOINT

[redacted]

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~~SECRET~~ [redacted]

R & D PAYLOAD FOR MISSION 7107

I - PAYLOAD:

A. Electronic Equipment

1. Downward Looking DF	$255.0 K
2. L,S,& X-Band [redacted]	80.0
3. S-Band Comb-Filter	75.0
4. Hi-Accur. Attitude Sensing	170.0
5. Basic TM/DL Data	205.0
	$785.0 K

B. Stabilization Systems

1. Hi-Accur. Attitude Control	$265.0 K
2. Electric ARC Thruster	105.0
3. Gravity Gradient Boom and Dampers	40.0
	$410.0 K

C. Control Systems

1. Stored Command System	$135.0 K

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CHART #12
Enclosure (1)

HANDLE VIA [redacted]
~~TALENT-KEYHOLE~~
CONTROL SYSTEMS JOINTLY

HANDLE VIA [redacted]
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II - GROUND STATION SYSTEMS FOR R&D PAYLOAD

A. Monitor & Record Command Status.. $232.0 K

III - FACILITIES @ NRL FOR R&D PAYLOAD

A. Anechoic Chamber Modifications....$230.0 K

B. Magnetic & Optical Alignment..... 60.0

HANDLE VIA [redacted] CONTROL SYSTEM ONLY

CHART #13

Enclosure (1)

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FUNDS FOR MISSION 7107

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	$9,887.8 K

HANDLE VIA TALENT KEYHOLE CONTROL SYSTEMS JOINTLY

HANDLE VIA TALENT KEYHOLE CONTROL SYSTEMS JOINTLY

CHART #15
Enclosure (1)

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NAVAL RESEARCH LABORATORY FINANCIAL PROGRAM
DEFICIT FOR MISSION 7107

1. With R&D P/L	2. Without R&D P/L
$14,765.6 K	$12,703.6K
- 9,887.8	- 9,887.8
$ 4,877.8 K	$ 2,815.8 K

HANDLE VIA
~~TALENT-KEYHOLE~~
CONTROL SYSTEMS JOINTLY

HANDLE VIA
PYRAMAN
CONTROL SYSTEMS JOINTLY

CHART # 16
Enclosure (1)

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