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BRIEFING FOR 15 APRIL 1969
ROOM 123, Bldg 59
1500 - 1600

Doctor John McLUCAS (Under Sec AF)
Mr. Harry DAVIS
COL Irving B. SCHOENBERG

SAFSS
SAFSS
SAFSS

BRIG GEN Russell A. BERG
Mr. William BOENNING


SAFSS
SAFSS
SAFSS

RADM Frederick J. HARLFINGER
CAPT Lloyd W. MOFFIT


OPNAV
OPNAV

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~~Secret~~ | ☐AGENDA FOR NRO MANAGEMENT VISIT TO NRL *B/4-59*

15 APRIL 1969.

1. WELCOME AND INTRODUCTION..... ☐ 1500
2. BRIEFING OBJECTIVES Statement . . . Mr. Lorenzen . . .
History Summary. " Lorenzen . . . 10 minutes.
3. MISSION 7106 OBJECTIVES
POPPY ACHIEVEMENTS Mayo 10 minutes
4. DIGITAL SYSTEM
Achievements
Potential. HAMMARSTROM . . . 10 minutes
5. EVOLUTION OF HARDWARE AND TECHNIQUES . WILHELM L. . . 20 minutes
Adjourn to Rm 409 via elevator ^{stairs} unless you depart this Room.
6. LIVE DEMONSTRATION OF SPACECRAFT ~~(7106 ALPHE)~~ 10 minutes.

1600

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, 3 April

ONE Hour to brief Dr. McLUCAS presents several problems:

How do we give him the picture of our Program, its accomplishments and the potential of the future when it is probably a Hardware session they are expecting.

Two things stand out as significant which might have caused the NRO staff to set-up this briefing request:

1. The GEOGRAPHIC-LOCATION SORT which the PSAC asked us to perform in late 1966 and which has not been tasked (officially) to date
2. The intensive hardware techniques briefing which Pete Wilhelm gave Col. Allen and Bradburn [] might have seemed non-controversial enough for POPPY to give without rocking the [] boat.

It seems that the aspect of "IN-HOUSE" Government Laboratory capability should be the major emphasis of our briefing. Our Past is certainly interesting to Dr. McLucas but not at the expense of his being very clear as to the techniques we use which proclaim a strong productive future during his stay in office, (4 years or so)..... We should be very clear and concise about the Future with a full DIGITAL set of collection sites.

He should clearly see our capability to do the POPPY job well if not extremely fast; but with payload lifetimes growing the added time between Launches is not leaving the NRO without the POPPY General Search capability. Rather there is the question that the data is accumulating in depth with only occasional Analysis community outputs.

Perhaps we could raise the question in his mind about the sacredness of the NSA circle of probable location (CEP) with all its assumptions as opposed to the fix coordinates given by [] without a CEP. It is certainly time that the [] Fixes were given an evaluation for accuracy.

Ephemeris discussion might be in order as an area where our accuracy is thus far limited and what we are doing to enhance this weak point.... RETEP the on-board ranging experiment to give real-time range information periodically through the data taking period.

Brower-Ladane earth model to be used overseas soon.

Significant Numeric integration by Dahlgren in production of our future ephemeris elements for overseas use, and NSA as well.

Potential Geodisy improvements to tie the points together better, using ARMY software at NSA.

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suggested inputs to Introduction and Welcome period....

1. The fact that NRL has ^{successfully} built and flown 55 spacecraft and 18 on POPPY.
2. The ~~Maxx~~ Satellite Techniques Branch in whose spaces we will visit today, has many customers, besides POPPY, the SOLAR RADIATION, TIMATION LOFTI have been the major efforts.
3. about 90 many years of effort are expended on POPPY each year at NRL. about 15 M-yrs on the EDINT portion.
4. POPPY is in its 10th year of existence as ^{an IN-HOUSE} ~~a~~ NRL effort
5. The ~~NRO~~ Visit is primarily aimed at a display of the HARDWARE BUT first we shall ~~reorient~~ ^{NRO} on the program, the Mission, the Method some of the accomplishments and then go into evolution of the hardware systems
6. The visitors will then be escorted to the fourth floor of this Building via elevator on the left as you leave this room, where the MISSION 7106 spacecraft will be viewed.
7. The visitors may then return to this room for Executive Session prior to departure from The Laboratory

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Notes relative to the 15 April briefing....

Item #

①. Introduction should include the division of responsibility within NRL for the PROGRAM "C" work... Wilhelm's and Mayo's various responsibilities. *Number of payloads, 18 good & 3 lost in launch (4 more underway)* Overseas sites support by NRL remains as a relatively unknown area of endeavor which makes severe demands on the NRL Staff, and directly determines the quality of the program-data.

②. HISTORY: *(Keep in mind Dr. McLucas is hearing this for the first time)* A summary, not the event by event or there will not be time within one hour to adequately cover the HARDWARE PORTION.

OBJECTIVES of this briefing are:

1. Refresher of How POPPY works, How the sites are oriented, manned and tasked.
2. The size of the instantaneous coverage (geographically speaking) 3500 n.mi diameter with a hole in center determined by vertical radar antenna beam width. The number of [] within the circle at one Time
3. History.... Firsts for this program:
 1. First ELINT collector by This country... President tasked ^{of 22} each/orbit.
 2. Electronic Shelter Huts

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12-4000

NOTE TO MR. LORENZEN

SUBJ: Briefing for NRO Staff and management set for Tuesday 15 April.

1. Significant factors which might have led to the request for this briefing:

A. Boenning, Col's Allen, Bradburn, [] had an NRL briefing presented to them on 9 April by Mayo/Hammarstrom and Wilhelm. The Maps of the Ship-tracks were NOT shown mainly because of Bradburn's presence. Bradburn and [] had to leave early so their questions were concentrated-on in the first part of the briefing, the hardware walk through did not really get started until after Bradburn and [] departed and during this part Col Allen learned that the NRL expertise was far greater than he had previously known because of the Gravity Gradient history given by Wilhelm. There were several other areas, Thrusters and the [] aspect sensors which obviously greatly interested him.

The portion of Mayo's briefing which seemed to strike a resonant-response dealt with the accuracy of []

[] ..evidence given to the Harry Davis committee in late 66 by NSA...I went on to list the areas of improvement in the [] of the data-quality and left the audience to draw their own conclusions as to how much the accuracy might improve. The next area of questioning was ⁽²⁾ in the regard to the computer use...I stated that the PSAC mandate was to weigh [] against its potential of having emanated from one of five High-priority pieces of real estate... "Geographic-Location Sort" was described just as it was nearly two years ago, (by Hammarstrom) for General BERG. ^{June 67} The examples at [] were shown again, ^{along with} and the statement that the community had not tasked the program to do geographic-location-sort even though this is ^{happens} perhaps the most powerful sort criteria for ABM, ^{IT IS} especially ^{powerful in} for being able to associate all the elements from each ABM/AES site, by determining ^{as well as} geographic correlation of the activity ^{through} similar use-patterns, or data characteristics. Bradburn and [] indicated that PSAC was still vitally interested in this technique and if our ^{program} guidance ^{has} ~~did~~ not reflect ^{ed} this we were not being kept very well informed....This aspect probably more than any other has led to this request for a briefing ^{for McLucas}. Therefore it is suggested that Geographic Location Sort be discussed in a great a detail as possible. We are making preparations in this direction unless given other guidance.

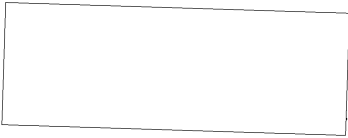
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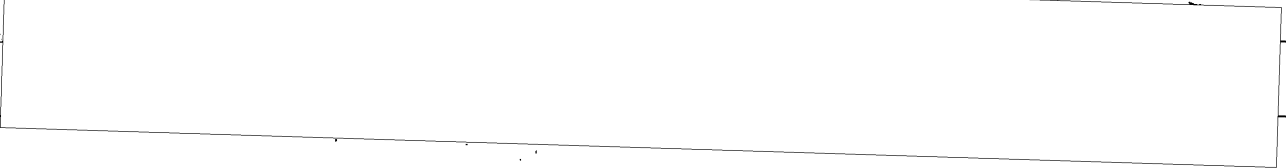
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0900 10 Apr Visitor from TOPOCOM All SI, TK, E cleared



0900 - 10 Apr TOPOCOM - ADS SI, TK, E



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The SORS meeting on 19 March (which provided NRB & NSG with opportunity to get the ~~Open~~ surveillance subject before a large segment) did ~~not~~ stimulate Col Allen & Bill ^{NSA} ~~Banning~~ to ~~visit~~ arrange for a visit to NRB on the ~~morning~~ ^{day} following CNO's scheduled visit of 25 March. When this CNO visit was postponed NRB rescheduled the Col Allen/~~Banning~~ ^{NSA} briefings ^{on this day} again, following CNO.

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STATEMENT OF INTRODUCTION AND OBJECTIVES by [REDACTED]

Management and

1. Welcome to NRL on behalf of the/Technical Staff.of.the Naval Research Lab
2. Reason for Briefing is to supplement the basic knowledge of the Naval Capability and Resources and

To stimulate thinking and planning regarding the Navy's use of space for reconnaissance and surveillance.

To disclose recent additional factors which could strengthen the Navy role early/^{for} identification, Location and technical assessment of Soviet Naval Combatants, while still in the denied areas. ~~xxxxxx~~

3. The first/~~xxxxxx~~ speaker Mr. Mayo will provide a brief refresher on the POPPY System.....The Mission ObjectivesThe Capabilities and the historic and contemporary Achievements.

The second speaker will be Mr. Wilhelm Branch Head of the Satellite Techniques Branch, Mr. Wilhelm will provide the description of the Hardware and technique evolution which has taken place at NRL over the past ten years under this Program.

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~~SECRET~~ [REDACTED]

9 APRIL Briefings on PROGRAM-"C" at NRL for Bill Boenning and people;
10:20AM COL Lou ALLEN, David D. and [REDACTED]

Briefing started at about 10:30 with a summary of the POPPY History, flight by flight and the manner in which the overseas sites have evolved. The improvements of ground instrumentation and the resultant improved quality of the data in a time-domain sense.

In the introductory remarks the request was made to specify the type of briefing which would suit the group best. Col Allen said that he had not heard our historic and program description pitch so proceed....

I built the history of each flight and its accomplishments, the basis for [REDACTED] how accurate it is, quoteing NSA's 1967 summary and then going into the improvements in the site data systems and letting them draw their own conclusions as to the contemporary accuracy, productivity and timeliness.

The ALERT, DESMAC DIRNSA history was given and the reinstatement of this effort as well as the

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MEMORANDUM

14 April 1969

TO Director Program C.

From R.D. MAYO NRL Code 5614.

Subj: Summary of Briefing for NRO and NSA Staff on 9 April.69

Background:

The SROS Briefing of 19 March resulted in requests from Mr. Boenning and [] of the NRO and NSA respectively, for a Hardware and History briefing at NRL in the near future. This was arranged to occur on the day immediately following the CNO visit to NRL on 25 March. When CNO visit was rescheduled for 8 April, both NRO and NSA visiting teams were also rescheduled for 9 April with NRO visit to occur in the morning and the NSA visit to follow in the afternoon. The request was made for the POPPY processing team at NSA/^(K-46) to review the attendance list to determine significant need and to try to keep it down to 10 or 11 persons including representatives from the K-46 group. Clearances were submitted for four men from the "B-Group" and five men from the "A-Group" from NSA as well as [] from K-46.

NRO Staff Briefing started at 10:30 AM with Mr Boenning, Col Allen, Col. Bradburn and [] in the audience. Mr. Mayo, Wilhelm and Hammarstrom as the briefing team.

Mr. Mayo provided a summary of the Historic milestones of the program, with the evolution of both the spacecraft and the overseas data collection systems. [] was extensively described as well as the 1967 NSA summary on []

[] A detailed step by step description was given as the last two year evolution of the receiving systems and the digitizing system with emphasis on the improvements in accuracy, timeliness and productivity. Note* there was extensive questioning as to the use of the computer and since [] participated in the Harry DAVIS PSAC review of the ABM/-AES effort in late 1966 and early 67, the description of this Computer utilization centered almost exclusively with the avowed/^{PSAC} reason for the deploying the computer in the first place...to perform initial sort on the data to []

which included any of the five most important ABM sites in the Soviet Union. This technique was demonstrated in the first month of MISSION-7105 ~~xxxx~~ (called Geographic Location Sort), ultimately described to Gen Berg in the early summer of 1967 and then subsequently not tasked operationally by either the NRO or NSA until early 1969 when NSA requested

[] form this sort against SARY SHAGAN. Unfortunately this [] and Bradburn [] as a highly interesting one for [] and Bradburn

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1. Bradburn said that the PSAC is again very highly interested in geographic sorting.

2. several significant points were brought out on analysis results which NSA had not capitalized on such as the DogHouse [redacted], the large number of unknown signals which might be

source of the unknown [redacted] Engagement radar. Suggestions ^{were made} on criteria for the stations for locating signals so as to get perishable significant locations without over loading stations. Particular emphasis was put on adding unknown radars to the list to try to find what specifically the unknowns are. An informal request was made for a more detailed explanation of the intelligence gaps they (A+B) were

~~SECRET~~ [redacted] fill so that the new pay [redacted] stations were suitable to the new ground CONTROL SYSTEM ONLY

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Laboratory 9 April 1969

(NSA)

BRADBURN, David D. Air Force (West Coast)

(Air Force (West Coast))

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~~SECRET~~How it works and a Brief History for the Benefit of Secretary Warner, *u. SecNAV*

However the major emphasis will be upon the techniques and recent results of an Ocean Surveillance development under this Program.

Chart #1= How it works

Interrogation period = $\frac{1}{2}$ orbit

Collection antenna coverage

Spectrum band-definition with Crystal-video receivers,

Pre-amplifiers where additional sensitivity desired.

GENERAL SEARCH = Detect within thirty days after first radiation, assuming that it radiates at least one hour per day. Locate to within []

Other parametric measurements of signal characteristics to general tol.

EOB requires that the signal be identified and located to within []

SOI(Signals Of Interest) listed as new and unusual or of high Interest. Generally they have been the [] type which escape the NSA Machine processing scan-sort

Main Beam Intercept During period of approach to emitter and then again as the spacecraft moves away from emitter. This gives a circular band around spacecraft (on surface of earth) within which, horizon looking radar, will illuminate spacecraft on each scan. If the collection band of this particular emitter is tasked then the spacecraft will transpond, pulse for pulse the signal ~~xxxx~~ to a dedicated ground sta. The time between pulses is carefully preserved but the down link is ~~changed to xxxxxxxx~~ in [] regardless of the emitter frequency. The down link pulse width is coded to indicate the spectrum band of data-origin.

Width of circular band is determined by the radar antenna vertical beamwidth; as the emitter is able to look higher and higher in elevation it will increase the overhead coverage and the circular hole below the spacecraft within which it can not see the emitter becomes smaller,... the same thing happens as the intercept sensitivity goes higher and higher until the sensitivity is adequate to see minor emitter antenna lobes then it is detectable from horizon to horizon regardless of the direction of the emitter antenna main beam...then one loses the most important identifying characteristic of the radar, that of Scan characteristic which identifies the nature of the emitter; whether it is air search, missile discriminator, height finder, command guidance or what ever its area of use can most easily be determined by this scan information....

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18 April 1969

BRIEFING

NRL, Bldg 59 Rm 123

Attendees:

John W. WARNER, Under SecNav

Hon Robert FROSCH, Under SecNav for R&D

Harry SONNEMANN, Special Ass't to Dr.FROSCH

P. WATERMAN

Adm HARLFINGER (possibly)

Adm Albert CLANCY



Capt Moffit

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16 April 1969

MEETING

Held at the Pentagon with Mr. BEONNING, SAFSS

Attendees;

Vince ROSE

Mr. Mayo

L. HAMMARSTROM

Re bands etc.

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196 Prog "A" vs Prog "C"

SUMMARY OF PHONCON FROM Bill BOENNING

On 16 April NRL/NSG/NSA all met at 4C1000 (Boennings) to concentrate on further definition of MISSION 7107. [redacted] crew let be known that we must not design into POPPY coverage which has already been [redacted] ..I told him that we did not want to get into [redacted]

[redacted] . . . after this warning I led the discussion through those [redacted]

As an aftermath of this meeting BOENNING [redacted] must have met on Friday and discussed this competitive aspect of the two programs and especially the Ocean Surveillance developments of the past year.... Bill called on the Gray Phone with the following summation:

1. As we are shooting for Ocean Surveillance, to what extent are we degrading the effort for the USIB, SORS & NRO???

A- If we stop the O/S work to what extent would our performance increase on these other National jobs???

2. Criteria for [redacted] locations. Now and in the Future???
- Duration of intercept, [redacted]

SEVERAL QUESTIONS ARE AIMED AT NSA.

3. How much would the General Search results increase if the Location accuracy was broadened from present range of [redacted]
[redacted]
4. Relative usefulness of General Search, EOB, SOI, [redacted] from POPPY as compared to other programs?
5. ALERT capability: Who uses and How
6. [redacted] results??? have they been reported???

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MEMORANDUM TO FILE

20 APRIL 1969.

Subj: Briefing Summary

1. 8 April CNO visit to NRL along with ADM's Cook, Moran, Aurand Capt Moffit. [redacted] with Mayo, Hammarstrom and Wilhelm giving briefing.
2. The following Morning briefing given to Bill Boenning, Col Allen, Bradburn & [redacted] given Historic summary with the emphasis on achievements and hardware & techniques
3. (9 April afternoon) NSA [redacted] had 4 of his men and 4 from the [redacted] with a historical run-through significant accomplishments along with the ship-tracks.
4. 9 April 4 PM til 6 PM = Code 5614, 5602 personnel briefing along with two of Pete's men (Eisenhauer and Wilson) given Historic and accomplishments
5. 9 April 6 -11:30PM [redacted] from Missile/Information Division from Huntsville Alabama who have the responsibility for the Information on the [redacted] plus the ABM responsibility I think...
From this extensive Give-and-Take briefing it became evident that with the Program [redacted] there must be a different goal for each so they would not loom as competitors with us... Thus the philosophy developed where [redacted] would be more tactically oriented to address the [redacted] while POPPY is aimed at a concentrated effort to disclose the entire weapons system by providing simultaneous very wide spectral coverage.
6. 10 April 8:30 AM Pete's crew given a Historic, Achievement and Dedication type briefing until 11:30.
7. [redacted]
8. 10 April 1:30 to 330 PM met with ONR on HRB contract.
9. 14 April gave DDR&E A briefing on Significance of POPPY capability for locating ships and use of [redacted] to [redacted] Moffit, HO. Lorenzen & Mayo. [redacted] attended and brought POTTS Briefing.
10. 15 April NRO team= Dr. McLucas, General Berg, Col Schenberg, Harry Davis with Bill Boenning... In attendance = [redacted] briefing team was Mayo/Hammarstrom/Wilhelm. 1 hr 15 minutes.
11. 7107 Design detail-goals meeting with NRO./NSG/NSA including Chief Kargle. 16 April. afternoon.
12. 18 April 10 AM [redacted] along with Misner got the full historic ship location briefing.
13. (Deputy) Under Sec Navy, Warner and Sec/Frosch along with Waterman, Sonnerman & from Frosch's office got the full historic, techniques and achievements ~~xxx~~ briefing from Mayo/Wilhelm. In attendance was [redacted], [redacted] ADM Harlfinger, Moffit and [redacted] for R&D

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MEMORANDUM T []

23 April 1969

Subj: NRO position on SLX, []

1. Tasking history of Mission 7106 has generally been un-inspired in other words the occasions when changes have been made are relatively few and the tasking has taken a staid un-varying format, recycling over a period of several days. This has been brought about by an decreasing dialog between the tasking office. (SOC) and the NRL team of design engineers. The repeated usage of Band 12 on the 7105CHARLIE spacecraft is a classic case of wasted resources...it has not produced a usable pulse in about 14 months and yet it is tasked on the average of about 2.9 times per day. The weekly summary of bands in which no signals have been heard clearly reports this deficiency of the spacecraft and NSA has noted the deficiency also...but the tasking of this band alone, (by itself) requires the entire ~~payload~~ spacecraft.

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28 April 1969

Mr. Mayo had  for morning visit

Mr. MAYO had Mr. W. BEONNING, Air Force for afternoon meeting

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