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BYE-059329-94

2nd Working Group meeting on SIXTH Fleet Requirements @ NSG 10 Dec 69. In attendance were Capt Draim-OP76, Cdr Olsen, McGraw, Morgan, & Lentz all from NSG, Cdr HULL and Mr. Shupp from NavIntCom and Center for Naval Analysis respectively. Trombley-Nipssa, Cdr McDonald-NFOIO, and Cdr Gambel Navy TCP/BCO. Mayo and George Price from NRL.

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Cdr Hull led off, outlining the Action Items from the last meeting. 1-NSG was to visit NSA and solicite end-product from K-46 which would be usable in the Ocean Surveillance (OS) theater. This has been done with concurrance from NSA on their willingness and ability to provide outputs as they are specifically requested.

2-NRL was to ascertain the compatibility between the output derived from the field and that from NSA and restraints on either source. This was discussed briefly with the note that NSA would process automatically both [redacted] or those X-Band would not be found at NSA...NSA would then provide about 50% of the ship signals which the field reports and occasionally they would report one which the field missed or failed to process because of some local work load problem.

3- NSG has arranged with SORS to task Mission 7105 more fully against the ship spectrum having now 5 orbits/day against [redacted]

2 " " "

2 " " "

Mission 7106 provides 2 1/4 per day "

1(4-ball)" " "

2 1/4 " " "

In addition to the 9 times per day for 7105 and 5½ times per day for 7106 NSG has arranged for the untasked orbit each day which goes southeast down across western Europe or the easter Atlantic to be tasked on special occasions against the Ocean targets for both 7105 and 7106.

4- NavIntCom reported that in Jan-March period operations "SPRING BOARD" would require several (6 or 7) major ships to go to the Caribbean. If the 6th Fleet will nominate a candidate ship with SINS navigation system It might be a cooperative Naval Target opportunity for [redacted] to Receive and Record the data through which an assessment could be made of the "Dedicated" capability of POPPY for Ocean Surveillance. The Cooperative Landbased target will be investigated by NRL, using CBD emitters as a further demo[redacted]on of the Accuracy and timeliness and productivity. The last two area[redacted]e evaluation would be the uncooperative landbased emitters and uncooper[redacted] Naval emitters using the [redacted]

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Frank Shoup of CNA seemed to be quite hesitant to discuss the aspects which would indicate the necessity for the dedicated test...his fundamental knowledge of POPPY is definitely limited and he along with CDR Hull are coming to NRL Monday afternoon. Intercept Probability seemed to be the area of his conc[redacted]bout POPPY's ability to do this job. We have a missionary job t[redacted]before his ability will show much of interest... He mentioned that there are three degrees of emitter Fix accuracy which would be needed (1) Gross ability, (2) Tracking ability and (3) Targeting ability.

NIPSSA is going to work with NFOIO....CDR McDonald will come up with the method that [redacted]and NIPSSA outputs can be evaluated by NFOIO.

Capt Drame suggested that NRL, NavIntCom and OP-76 work on an Advanced Development Objective (ADO) paper which would define the steps toward the operational Ocean Surveillance ELINT System. Joe March as an alternate to SORS was suggested as a valuable source of assistance in this connection. I also mentioned that Bob Stone has asked us for a briefing to up-date their information file on this program now that 7106 is working....

Two action items for NRL

1. Investigate the capability of CBD to furnish a cooperative land-based emitter which we could use to statistically prove this latent capability of POPPY when dedicated collection is possible from [redacted]

2-Participate on the ADO paper

3-assist Frank Shoup in getting up to speed so that his systems analysis talent might be brought to bear in defining the steps toward selling POPPY's capability toward a Tactical Ocean Surveillance system.

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Problem A[redacted]

1. Spacecraft...Mission 7105 and 7106 are not being evaluated toward improving our concept for the future missions. The mechanism to perform this evaluation will be at NRL with the installation of a computer @ NRL. Personnel for this task will be treated separately later on.

2. Overseas Sites electronic systems: Analog Tape Recorders It is suggested that a cooperative task be written up where the present 14 track instrument be fully evaluated by the Misner Dept. where we would not be at their mercy for either schedule nor where we would have to expose all our moves to their judgement. I don't like to play my cards close to the vest except I have seen Misner impose a rather relaxed schedule on work which would otherwise have had a much faster cadence.

~~x~~The same suggestion

3. The [redacted] Computer will be acceptance tested first in the group of three systems which are going under order in the next couple of weeks. It is a great loss to the program for this system to be ready to deploy but must await the completion of the building at [redacted] I feel that the site must not bear the burden of accomodating this system before the building is ready. Instead I propose that the computer be placed in a "Trailer" (like outside this building) and placed on-line adjacent to the present building at [redacted] This trailer could be staged on our roof. On a "CRASH" basis this procedure could for a modest investment of Man-hours and the cost of the trailer place the computer in operation about 6 to 8 months earlier than would be possible with computer awaiting the completion of the new building. This Trailer housed computer system is also applicable for Army use in [redacted] and possibly in [redacted] The environmental and systems engineering investment in support of [redacted] could be amortized for more than the single site, and thus could be justifiable. The comptroller and the NRO have been assured that this digital system could be ready to ship in nine months after go-ahead, but because of fiscal reasons of combining the procurement of more than a single system the procurement has been delayed for several months. An absolute earliest date by which the system could be placed in operation by means of a trailer installation would be about 15 May 1970, as opposed to 1 January 1971 for the date inside the new [redacted] building.

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The recent maintenance difficulty with the digital system in [redacted] has focused (at TOG) a lot of attention to the areas of responsibility which have been shared between NRL and NSG in the past. CDR HULL has certainly been fair and objective in his inquiry about what can be done to support them better for the Short Haul and for the Long Haul...The day after [redacted] got the system up and operational again so the Short Haul problem and necessary solution dissapeared but the long range solution still must be faced up to.

[redacted] has certainly been beyond the outstanding caliber for digital maintenance and under his influence for the past 2½ years has led us to under estimate the necessity for providing the sites with on-Site engineering assistance. Thus Dick Wales has not been replaced with a maintenance technician or anyone elsex for that matter. NSG now has said verbally that System maintenance assistance is needed at least during the first year that a system is in operation. The sites have been asked to contribute constructive criticism on the documentation for the digital system components. The way this subject stands now is that NavIntCom (CDR HULL) will attempt to write up what ever we feel needs to be put into print from the program director to NRL to support our quest to have project personnel at these sites.

As you know Dick WALES is now the most valuable person to this program because of his PHD in POPPY brought about by his 2 years overseas in the operational scene. In the future it would be benefitial if these men would be NRL Employees so that their expertise could be used more directly on the program after their overseas tour was completed.

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To: H. O. Lorenzen
R. D. Mayo
The Group

Subject: Attempt #2
From: L. Hammarstrom
Date: 12/17/69

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This is the second try at presenting across the board the work situation as far as it stands (as of today). This is written in response to several meetings last week in which the comments came out that the priorities had not been addressed and that there were too many wish items. This paper is presented based on 1. a criteria for establishing priorties 2. the placement of the individual items in each priority class. The discussion is almost entirely on the highest priority items. No schedual has been worked out, but, this can be done if it is desired

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To establish a relative standing of the various jobs a criteria must be established for evaluation. Since our overall effort is aimed at providing ELINT ~~intelligence~~, the criteria will be how significant a particular job is in timeliness, in quantity of data, and in accuracy of the end product. The results of applying the criteria of ~~end product significance~~ will be a priority List of efforts. The next step is deciding where the cutoff point is as to significance so that the jobs below a certain end product Level are eliminated. The tough part then comes of management. By the dictionary management is defined as; "the judicious use of means to accomplish an end." This requires the painful juggling personnel, the detailed scheduling to optimize the end result, building up of capability where it is needed, the careful picking of the right man for a particular job in view of all the other jobs, the constant planning and [redacted] of the budgets etc.

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To put some perspective on why I believe we have a serious problem here is a partial List from the main part of the paper. [redacted] has put out only 1 Location report of 3 Locations (Spec.) since the 15 of Oct. (2) The 7107 mission has not had a single meeting of the responsible heads, Pete, Ike, Beal, Winkler, Vince, Reidy etc. The mission isn't defined and the rocket isn't defined. (3) We are allready two months Late in the date for the deployment of the [redacted] computer. [redacted] is losing it's entire (inevitable) first team within 3 to 6 months and we still do not have the documentation or training to educate the new personnel. (5) [redacted] is still using R-390's four years after we put solid state receivers in the field and they are unable to resolve the pulse widths of the 06 birds. These to me are serious problems that only we can solve. NSG, NSA, NIC, and the NRO may have some contributions, but, we are the only people with the technical talent and experience or mandate to solve these problems and others which are Listed in the main part of this paper. If we just continue our present efforts, by next summer Fort [redacted] will be down to nothin

NIX

OK

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Lab does not come under a lot of review and criticism. I will be very surprised. What we need is action across a broad front. Just writing this paper won't help at all there are 6 papers which I dug out of the file on the same basic subjects and they only proved to be discussion items. We need Long term planning and scheduelling. (the 07 mission will probably still be operating in 1976)

In reading this each individual will have his own reaction. I hope it will be positive. In reading this if the message does not come across that we have serious problems which are being handled by default then I have failed. If these items are seen by other facts or alternatives, please write them up! If I have offended any one I apoligize, but this is very significant National program which, in my judgement, needs the facts lay out and a Long term course of action followed. I believe the means can be obtained to solve these problems from within the Lab. For example, The E.S.D., TID and Training branches are supposedly all low on work. In addition there must be other technicians available from unfunded projects elsewhere SYSTEM ONLY b.

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There appear to be three categories which the efforts fall into. These are in descending order of significance with Category I being those items which carry the most significance in terms of our basic aim of providing reliable ELINT intelligence as accurately and quickly as possible. The items placed in this category are those which I feel need immediate attention in terms of keeping this high priority national program producing data. By data I mean any part of the chain from the actual collection to the final publishing of reports out of NSA or DIA.

Category II are those items which while important and directly relating to our output are of a nature as to be of less significance or can be bypassed by some alternative route even though it may be awkward or time consuming. There are a number of items in this section which must be worked on now due to their lead time or to their interaction with other items. The difference between Category I and these is that the completion dates are not as critical.

Category III are those items which I feel maybe very interesting and have long range significance, but do not equate with categories I and II in the basic aim of producing data.

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Solution @

Category I

1. [redacted] (getting and keeping computer operational) — Tech Rep.
2. Documentation and Training — NRL
3. [redacted] Computer
4. 7107
5. NSA Software George (hire)
6. 7105 - Crosstalk, pulse dropping, squitter. Tasking changes (Vince) + me
7. 7106D filters (N.G. Vert) (19.2 db) (17-19 Kc)
8. New Command Technique (stored) (BP + 13) (7106) Tool.
9. Tech. Reps. Mayo
10. Logistic support (3rd man needed.)
11. operations (Action messages, Reindeer messages, stability, thrusting, etc.)
    Site Manager/coordinator.
12 - Mid East Dig System.

Site Manager (Geo will write this up)
Short term
New D/L

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Category II

1. BTU
2. Analog tape recorders rotating. Geo Price
3. Antenna controller punched tape. Geo go on all sites
4. video disk.
5. PRF-synthesizer } Geo QC "ad-hoc" meeting NSG NRL NSA
6. fiber optics
7. [redacted]
8. Antenna P/L rework Jim Oconnor Backfire, Dish (45° X)
9. CRT-Light Pen System Rial working on it.
10. [redacted] Redo - new receivers
11. Third Generation "Cherry Picker" ← Cat-3
12. [redacted] $135K worth of (consider every means for Computer) (move with array) Geo
13. New Orbit Model ——— Tom Lawton
14. [redacted] check out Jim/Lee recommendations by.
15. 176 checkout Exp #1
16. RS 1-A power supply Jim/Geo. retro in field.
17. Site RFI study Haskins? 4 S + UHF

Priority I

III GSP's suggestion

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New P/L Freq

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Category III

1. 6th Fleet excercise
2. System Calibration Unit
3. Channel "A" Receiver
4. [redacted]
5. Computer Controlled antenna-control console
6. Time Code generator
7. Re-do Apu system.
8. VLF-sor time system
9. R+D payload
10. [redacted] Computer system.

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OPERATIONAL SIGNIFICANCE

Needless to say the items listed in the introductory part of this message will be heavily weighted.

The #1 priority in terms of productive end product is [redacted] because the station has [redacted] produced only three locations since 15 October and even the S.O.I. reporting is down to a very Low number. The significance of getting this station up and running must be one of our highest priorities. Certainly we can exert pressure on NSG to make the station more cooperative, but the burden of getting their immediate computer, disk, ADD/S problems solved can not be done by any other group. The first step is getting technical aid to the station to evaluate the actual problems and fix them. Also the person going out should review the entire spares inventory so that the station maintenance personnel cannot delay fixing equipment under the excuse of not having the parts needed to fix the equipment. The second step is a short term training effort. I believe that we should pull at least one man back to go to the SEL school in January, [redacted]. Pulling another man back to go thru ADD/S, BTM-9, receiver training should also be done. Needless to say we will have to take a strong position on this with NSG as they have not been overly cooperative in these types of ventures. The documentation and training are the longer term steps to solving the [redacted] problems as well as [redacted]

10 Dec Power wipe out.

(now have 4.)

The #2 priority is documentation and training. First documentation; while we have some individual items which have good documentation, such as

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getting the hardware itself built. Two supporting efforts here would be pushing the TID clearances so that the resources of the Lab can assist and the obtaining of a technical writer, like [redacted] to coordinate all the documents and make them consistent in terminology and grammartically correct.

The third item is establishing training procedures. This will be necessary even with a tech rep on station because ~~a single~~ no one person will never be able to handle all the maintenance at a computer field station. For example, [redacted] which has been operating pretty well, has Chief Lenker, leading ~~heading~~ two first ~~classes~~ men who have had a lot of personal training at State College and at Fort Lauderdale. In addition, there are three other maintenance people as well as Tech Rep - and Earl Lybarger who advises and helps out. I think we should put out an official correspondence to NSG and NIC requesting the setting up of at least a minimum level of training and having selected personnel attend Ft. Lauderdale. Another step we could take would be to make up several training films on the difficult parts of the system, such as the disk, the ADD/S, the receivers, etc. A third approach might be to send to each station people to hold class on the equipment. This has many disadvantages such as the expense, the distractions of the station, and the operational conflicts although perhaps for the [redacted] and [redacted] a two week shut down and training may be more efficient in the long run. We should also setup some across the board familiarization procedure for all personnel so that the officers at the [redacted] will understand the basic

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technical system, the logistics system and the operating procedures to keep the enlisted men from "pulling the wool over their eyes." In this area we would do well to have one man, maybe even a cleared person from the training branch to coordinate the system. He could keep track of all the people scheduled to a station and departing, make arrangements and escort people attending NRL, NSA, Ft. Lauderdale, etc. In addition, he could monitor the general station activity in terms of parts requests, computer outages, and the NSA feedback to see when equipment or the operators are in need of help. This would be in addition to making up course outlines, getting the technical information, etc., which are fundamental to a training program.

I believe the way we must look at this problem is that the Lab, through Tech. Reps. only, or NSG through some training procedures of their own, will never be able to keep this complex receiving analysing and processing system going. We must accept our responsibility for at least the technical education across the overall program.

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7107 - This is so fundemental that it has to be pushed hard. The present birds have been in the air for [redacted] smoothsand "A" bird was on the shelf for almost a year prior to launch. If data from the 03's, 04's, and 05's hold the 7106 system should operate as a [redacted] until 1972. At the present time Pete is committed to a SOLARAD Launch in the fall of 1970 and a high altitude SOLARAD in 1972. Pete has only a few primary engineers, [redacted] winkberg, Beal, Rovinski and this situation is going to take a lot of management to avoid conflict. At the present we are not taking any positive steps toward defining the mission goals or the rocket which we will go on. This is a very major effort which we are going to have to push if we are to get this items resolved. We need to look to the time period when 7107 will be operating which will be 1973 to 1976. In this time I feel the need will be for a much more tactically oriented system which will support locational accuracies 10 to 100 times better than today. We need to really think this effort thru now and not let the [redacted] be decided by default. To date we have had a single meeting in [redacted]/year

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to plan and discuss all the ramifications of this 7107 mission, the new structure, etc. There is also a tremendous amount of information available from the SCX data and the density data which should be used to provide the sensitivity and R.F band limits. There were two bands which massaged for the 06's and both of these are quite successful. The SCX and density data were not available so a different approach was taken. In case 1, X-band, I wrote a message to the stations asking if the current X-band was ever reasonable. [redacted] responded that sometimes D was processable and that they would isolate the signal and look at just that time on C ball to sort the data out. After a little correlation of times of these occurances it was noticed that when D was processable it was flying upside down. By working with Vince the equivalent sensitivity was put in the 06's and now [redacted] is reporting X-band locations on a regular basis.

The other example was the 1080-1205 band this was flown with -65 dbm sensitivity which is quite higher than "normal" for these frequency ranges. This was possible because we looked at all the Radars and set the [redacted] limits on the RF bands to avoid high density.

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This paid off with getting [redacted] The problem is that we never were able to do any more bands. We have bands like 550-650 which should have the [redacted] in quantity, but all we get are a few scans of a few pulses per burst. For another

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examples, would be the L band low S band range where L band 1.2-1.8 gc is almost too dense to process while the 1.8-2.1 & 2.1-2.5 & 2.5-2.7 are all very sparse. certainly, it is nice to have some frequency resolution, but our real game is identifying new signals and corrections, both of which are made much harder by high density. With the SLX data in standard / high sensitivity and the weekly band by band density data. we have the opertunity to really carefully match the 07 birds to the computing system for the best output.

The quite a few areas need hard work on to decide the right approach and to get the hardware moving. Some of these are the command system, we had a initial discussion on this close to a year ago, but we need to get a system which will do the complete job without all the errors. (close to 100 passes have been missed to date) This can only be done by close coordination between our group and Pete's. Some of the details in this are how to insert satellite predicts in the ~~memory~~ satellite memory so that any station, sh

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use the data without requiring some communications system to route it 2 day or two after the Sect. This also pertains to the design -- (In the time these satellites are used (1973-1976) Tactical must be available.)

P.L./T.M. Link of how to get all this data Loop with altitude, voltage, temp, data, which will probably be needed for the accuracy this system will need to be competitive and to meet the requirements in the 1973-1976 time period.

Another item is the use of a new R.F. frequency for the Data Links. If the interferance in the 144-150 mc band continues to get worse, by the time we hope to use these birds we will not be able to for the interferance will be like [redacted] where we have complete frequencies "wiped out." I personally would recommend having both, an "L" Band and the 148-150 mc band with the capability of using any band on either transmitter system at any time. This would allow a gradual change over of the field stations, but, more significantly where there was not interferance allow one set of NRO tasking on the bird for the L band system and Navy ship tasking on the 148-150 mc system. (or vice-versa.) The "L" band system would have the freedom from the ionspheric errors and [redacted] may well limit the system

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These are just a few of the considerations that need to go into the 7107 mission. I think that unless we get moving we will probably go thru a period of not having an operating location system in the 1972-73 time frame. Every day that we do nothing now is adding at least a day on to the launch and is letting a large number of Pete's people go without any direction and/or output.

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[redacted] computer - Basically covered in memo of 5/26/69
The work could be accomplished by this group if
2 mechanical engineer could be assigned for about 2
month and if 2-3 model shop people were
obtained for the outsitting and installation.
Reid has some alternatives which need considering, then
we should make a decision and get moving. If we are
going to meet a March date we have lost over
a week since this was proposed.

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To: H. O. Lorenzen
R. D. Mayo RDMayo 12/11/69 A study of alternatives is now underway
From: L. Hammarstrom
Subject: [redacted] Computer Deployment
Date: 12/8/69

A situation is developing which can bring criticism on NRL and have long range operational impact. Our original date to the comptroller and the NRO for having the computer system operational was Nov. 1969. The building we are to put the computer in is now scheduled for completion on 11 December 1970. Assuming that the building is completed on time and made available by the third week in december the earliest that the computer could be operational would be 1 February 1971. If this bld. is delayed this could go to the fall of 1971.

In submitting our proposal nothing was mentioned about waiting for a new building before we would put a computer in [redacted] Operationally this computer will cover a geographic area which has not been very heavily covered by other collection systems. The intelligence obtained on the eastern end of the ABM ranges will be very significant and for the Navy the coverage of this fairly active Naval area and the complete coverage of the northern sea transfer will be

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very important. As the schedual now stands [redacted]

The following is a low cost plan which should allow us to be operational much sooner. This plan would be to put the computer system in a van or trailer which could be shipped to [redacted] and tied in to the existing operational GRD-6 BLd. A second van or trailer would be needed as maintenance and storage space. With the appropriate man power behind this we could have the computer and van operational by the end of March 1970. Fred Hellrich has the details on the computer, buying and fixing the van. The estimated extra costs for the vans and air-conditioning should be k

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This approach will eliminate potential criticism, provide significant operational intelligence and also, prepare for another need. This would be providing a computer to [redacted] When the Bld. is completed and the computer operational in [redacted] these vans could be shipped to [redacted] to give [redacted] an operational computer without fighting all the building problems, temporary status, priority of projects etc. Another advantage would be meeting the first phase of the basic army requirements for the 1970's for van type support of the tactical army. This is supposed to be a firm 1975 plan to utilize Poppy in direct support of the Tactical army.

In summary, by putting the computer in a van we will be operational with in 4 months of our committed date not 15 months to 24 months late. The operational impact will be much greater and we will be taking the first step to meeting another important requirement.

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NSA software help

This is a very significant effort in its long term results and should be in the top priority. The effort involved in this if we are really to contribute to revising NSA's concept is going to be at least half time for a period of at least a year. The easy part is now when a general review, and general steps are outlined. When it gets down to new programs which do not work and which NSA can't figure out why it will be a tough time consuming effort, but, this is the sort of effort needed to remove those subtle "bugs" which really make a program go.

New Command approach — This is a very significant effort because as mentioned before there have been close to 100 passes which have been missed due to this problem. A system of having all the tasking done by [redacted] would, I believe, reduce very considerably the mistakes and allow careful monitering of all commands sent to the satellites. This would enable the 07 designers to obtain information as to the possible causes of the problems, ie, interfering signals, somebody with the birds, hard ware problems, etc.

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benefit would be that the tasking could be setup in a period of time when it would not interfer with data collection. The collection could be timed to start before the satillites come over the horizon instead of reading it out and then commanding each bird, as is now done. To collect all the data, establish the procedures, write the messages to start the system, and moniter the system till it gets running will probably take one man close to full time for a period of 2-3 months.

7/05- This operational series needs a carefull examination by those people who built the payloads and the experiments. We have reports of crosstalk and regeneration which have not been evaluated. In at least one case (100-125 mc band) if there is not cross talk then there is a new ABM oriented signal up. There are also pulse dropping and squittering problems. These should be looked for the failure causes. (lowpass capacitor on video amplifier(?) or filter can pressure; gono(?)) This should be used to des[illegible] as well as moniter the genera[illegible]

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7106D - Work is needed here to complete the failure analysis of "D" and to redo the filters in the receivers so that the data will be processable from horizon to horizon. The effort of retro fitting the receivers will probably be quarter time for a period of 3-4 months

Tech. Reps - This effort is going to require a significant amount of time to (1) get three people, (2) clear them, (3) train them, and (4) move them overseas. From past experience this effort is going to require close to a full time effort for the next 1 to 2 years until the people become established and then it will probably start all over.

Logistic support - covered in Fred's memo.

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Operations

This is an area which is currently undefined an sort of limps along on a "catch as catch can" basis. This is the official interfacing with the outside world via the message center. Currently, we have 9 action messages outstanding, we are two quarterly reports behind (almost 3), and we did not inform the field stations of our previous thrusting until they had wasted over 200 hours of computer processing. These have to be embaressing to the Laboratory and should be taken care of. In addition there are the weekly Reindeer messages which quite often have many items which we should address such as command problems, power problems, (we have never given our revised engineering evaluation of IC4 to anyone!) cross talk problems etc. The data from the field stations should be reviewed and those item such as I pulled out in the ship borne COOO's fed back to make the stations processing as pertinent and direct as is possible. The location reports should also be monitered for residuals getting too high, location reported when there was thrusting, etc. The [redacted] routing messages and reports [redacted] amounted to about 3000

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and 200 reports will probably double next year if we get [redacted] and as it is now many messages never get read, and only a very few get routed. I believe that this area is important enough and the potential source of enough embarassement that one person should be assigned full time to this function of review and routing.

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This will be a Limited discussion on some of the items in category II.

1. BTU's-these are needed at all digital stations. We need two buffered systems so that preventive maintenance can be performed. This is quite significant with the OS 360 operating, there must be a capability on Line all the time and if the computer is used there is not enough time left to even run the O.C.-Edit program and no locations can be processed.

2. Tape recorders — The messages in response to NSG's request for manual and equipment discription, Adak has Listed two recorders with over 30,000 hours of use. We have other units with has much time and the maintenance and parts supply are quite high. There is a 14 track recorder at Blossom Point it needs evaluated and then a decision made do we refurbish all the existing recorders or do gradually change over to 14 track machines where all the data from 1 pass can be put on 1 tape. This will be quite a help in analysing weapons systems synchronous pulsing, scanning across different R.F. Bands See George Prices memo for more explanation.

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3. Antenna Controller - The tracking of the satellites is one of the few boring jobs we have left for the operators to do. The operators find it much more interesting to listen for S.O.I.'s. With two satellites to track the problem is even more severe. During the checkout of 06 in [redacted] after seeing a lot of poor data in the digital listing I started closely watching the operators tracking. Many times the operators would be 10° off and several times they were 20-30° off and one time there was a 45° error. The people at other fieldstations reported similar situations. For the minimum system of paper tape reader and D to A converter we will greatly improve the overall data quality.

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S.O.I searches. I believe that a lot of effort should go into planning and selling the digital system. I believe with the powerful people who are sympathetic with this program, such as, Dr. Cook the SORS head and Dr. Nake the NRO head that if we really pushed this through official channels we could win. A very significant additional advantage of this station is its coverage of the Meditranean, the middle East and the Indian ocean. If it were not for the amount of work already in Category I this would be in that class.

5. Third Generation Cherry Picker - This system is intended to take the basic information which is available out of the Cherry Picker, compress it to burst and scan information. Then display it on a CRT-Light pen system in real time for the operators sitting the collection position to do the initial sorting which is now done only after the manual analyse and two more runs of the pass thru the computer. This should allow almost real time operation and permit the same number of station personnel to [redacted] many more locations per [redacted]

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