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ITEMS FOR MR. LORENZEN'S ATTENTION PRIOR TO TRIP 18 August 1967.

1. I sent memo via on the aspects of the
7105 Engineering Evaluation to be carried out in ..Crosstalk, R & D
experiment (Signal Level and evaluated in each of the bands
where it is available; High sensitivity option to be evaluated over the
total spectrum where it is available. Detection experiment. In addition
to these up-stairs exoeriments and crosstalk aspects of the evaluation
there is another large portion having to do with the instrument-
ation....New Computer Programs (software) designed to expedite and extend
the use of the computer; Calibration of the geographic Location Sort against
precisely known targets.....To carry out this list of highly essential
tasks we submitted the following operational plan:

(a) would interrogate all official tasking possible on highest
priority basis so those sites down stream would not notice our efforts in
engineering-wise evaluating the other 2 packages ...for instance if Group
I, II or III were tasked offidally,(these use 05A &05B) we would lite
them off for the rest of the community but we would also turn on 05C & D
with certain of the above evaluation of crosstalk or our experiment. In
Fact the Sea Surveillance effort would be most often utilized here if the
geography was adequate.

(b) would collect data on the official tasking on a priority
which was secondary to that of the engineering evaluation except special
Ultra-high priority official tasking which will be specified by

(c) the engineering evaluation would commence on 21 August and
last for up to eight days with daily dispatch reports on the
engineering evaluation tasking carried out in

2. Quarterly QRC status report sent to OP-35 via Ford.

3. Tried to reduce the ...not successful but
still trying via YAW manuever and other thruster.

4. Sperberg and Heindl discussed in some detail the sea surveillance aspects
of our effort in and emphasized the aspect particularily
in the Med...also some ideas that Adm. Martel would be of unlimited
support if this this capability could be demonstrated a time or two...
They were very appreciative of our interest in hearing what they had
to say.

5. Selectric typewriter is now installed and awaiting development of the
format which is mutually agreeable to NRL & NSA and which has no
shortcoming effort which could take several days and a meeting or
two if the past NSA imagination is indicative of their grasp of this proble

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HANDLE VIA COMINT CHANNELS ONLY

~~SECRET~~ [redacted]

suggested list of

6. ~~xx~~ Pete is developing the/aft rack group of payloads and they do not really fit the following requirements: (1) directly support the future engineering design of the Primary payloads ~~xx~~ (2) the total weight of primaries plus secondaries should be quite near the ability of the vehicle (they lack some 235 ~~lbs~~ now) (3) Their proposal does not dilute their effort in our behalf since it requires almost no enginering talent who would otherwise be working on our birds (it will use uncleared/help electronic ~~&~~ Mechanical design and assembly talent which are not paceing items). We most seriously suggest that Pete realigh his proposal to take off some light weight large size calibration ~~xxxx~~ spheres and substitute in their place a couple of special engineering R & D payloads which we either build or have build to do a [redacted] seasurveillance job under the guise of new command or data system or something like that.

7. I have interviewed a potential new employee/in the GS-12 or 13 level [redacted] who has a fine background in theoretical mathematicalanalysis like Bob Daniels at HRB Singer.... we are obviouly weak in this area but the group is so very systems oriented that I doubt if we could keep him happy for very long. He is now in Melpar and subjected to sever restraint in doing the type of work he would like, due to company retrenchment. He does not fit the Staffing Plan for a Section Head to lead the group which will ultimately replace the local HRB group. Suggest you see him when he bring his Form 57 in. We are going to submit it to Civil Service ~~xxx~~ board for rating to see what kind of an offer they will let us make. Sadie has his resume'

8. [redacted] up-dating move from HUTs to building scheduled for mid Sept. recommend 6 men for this job, Price, Johnson, Becke for the mechanical Hellrich, Fisher and McDavit for the electronic part. We need Fisher cleared and hope that pressure can be brought to bear so that the Admiral will grant a waiver on the requirement of expanding A Background Investigation which was completed last March. We need him in harness anyway but this is the current reason. The [redacted] up-dating will take far more effort than say, the [redacted] one because of the lack of spirited interest and offical-mandate which NSG Headquarters set up so well in the [redacted] with its [redacted] Primary interest will just tolerate our entry into the building and cant be expected to do much to help...I expect plenty of problems and the great need for diplomacy and rough men to get it done without significant assistance. I have not talked to Mr. Sheets about Mr Davitt but his experience make him a very logical choice, particularly since he [redacted] t there in June and knows the people better than any one. His assistance would greatly expedite an already difficult operation.

~~SECRET~~ HANDLE VIA [redacted] SYSTEM ONLY

9. The [redacted] effort described earlier is now falling into two parts the Sea transit, and later on the Norwegian sea. The first is being tasked under the disguise of Engineering Evaluation, for a period of up to eight days. Thesecond could be specially tasked if Heindl can set up the Quarterly Shut-Down at the appropriate time. He will need some advance warning as to the specific three days we want for the Norwegian Sea search.

10. We have been working Mr. Wales pretty hard and hope to secure him for four or five days while we are there.

11. HRB is getting audit figures so the Lab can buy the first dozen of the new receivers which Mark and [redacted] have worked up for the past year. They will have the Adaptive thresholder and a digitally controlled frequency-synthesiser built into each receiver...one day they may be tuned by the computer. Thev cost about $9K each in this early production. We hope the price will drop when we order the next 48 units (about Mid October I think). We are taking the first unit over to [redacted] with us this trip to get a good sample of experience with it.

12. The Digitizer design is rapidly being frozen with some growth potential and will be presented in an unsolicited proposal when I get back so we can make a decision of whether we want them in all sites or just some of them befor next May or June.

13. The Analysis on 05 data so far does not look very inspired. The sites by noting in dispatch, the Signals Of Interest (SOI) determine the specific tapes which Conlon looks at and his people answer these/SOI site findings with a Quality Control response which are forwarded to us in the system.... Stan has made headway only on a very few tapes probably less than a dozen so far. I have the feeling that they would just as soon we had gone in the drink. The separation argument has been resolved to a great extent with Stan's success on Pass #270 when he used the digital tape and found locations which correlated with his previous findings and had semi-major axis of about 30 miles. This is still a bit large but if he improves the ephemeris and uses the system [redacted] to reduce the instrumental error to a minimum the size should drop to less than 10 miles. Rev #270 was during the June period when we were in [redacted] I would like to see him analyze some of the data from [redacted] which are now about [redacted] and see what circle size he gets. I don't think it would be too different using the same quality of data.

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[redacted] TRIP PLAN

I. Receiver Evaluation....

The first four samples of the second generation receiver (Complete with Adaptive Thresholder and Digital controlled local oscillator) are being readied for evaluation at [redacted] by a team of NRL/THRB engineers. This evaluation is the determining factor in the decision to deploy these receivers throughout the overseas data collection system at all sites. The production of the larger quantity of receivers awaits this evaluation so it is imperative that minimum delay be incurred so that if warrented, the production can continue on a routine basis and provide the required quantity before the operational date of late October 1968. It is the Man-Machine complex which is being evaluated in [redacted] the receivers are to be placed in the operations space and the site personnel, both operators and maintenance, will have to live with them under live-data situation for a period of at least one week. The judgement as to service suitability will be made by both site and NRL personnel. Technical performance has long ago been ascertained except in the military ambient of the site.

II. The second Phase of the trip will concentrate on the Quality Control aspects of the site in perfecting the proceedures and techniques which will eliminate the problem areas in both the digital and the analog data.

III. Several intermittent areas of system performance have shown up and an attempt will be made to provide the required fix...Interrogation antenna controller is intermittent so new control cable is being sent to be installed during this visit. An oscillatory condition has occurred in the motion of the AZ/EL antenna and a careful alighnment procedure evovled between NRL and the manufacturer may eliminate this.

IV. Operational Evaluation of the Flight experiments will be attempted to determine whether the absence of data is just because of tasking deficiencies or if the experiment is truly incapable of providing data.

V. Parametric Measurement experiments for [redacted] and Signal Amplitude will be subjected to routine examination again but this time the goals will be to develope these data schemes as powerful sort-criteria for the data anaylsis community. It is also possible that the use of these experiments can [redacted] monstrated as an absolute measurement of both ~~Amplitude and puls~~ [redacted] th parameters by observing both the ~~temperature and voltage~~ from the flight package during the time of the observations.

HANDLE VIA BYEMAN
CONTROL SYSTEMS JOINTLY

SECRET [redacted]

7105

[redacted] Evaluations Aug 21-28, 1967

I Cross Talk ... Same as in June 1967

II Regeneration first heard 1094 prior to 20 Aug in 05D-9 Not catastrofic since it is going to have periods of usefulness when temperature is low again.
100% Sensitivity on 1224 on (28 Aug) for 20 to 30 days.

III C/O spacing attempt so far unsuccessful - now 19.2 n mi and still increasing. Can USA Try [redacted] in 500 to 550 mc [redacted] signals? only a few are in this low portion of the 500-650 mc band.

IV Computers: Calibrated (in so far as is possible with current Ephemeris) against AN/FPS-30 & -17 & [redacted] with varying degree of accuracy due to Geometry & intercept.

V Programs were streamlined, Utility Tape-to paper & vice versa were installed & checked out. PRF Sort (P-5) & location from ST data (P-7) were installed to extend the usefullness of the Computer.

VI Computer fulfilling highly essential real time Quality Control function of Field Digitizations.

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Hammarstrom to Mayo

[redacted] @NSA

I saw Stan on thursday and:

I) He is sold on digital tapes

1. Digital S.I.D. [redacted]
2. Faster running on our digital tape than audico's digital tape!
3. Higher percentage of scan sort results
   Digital 80% – 90% vs. 36% – 75% FM.
4. with this a faster running time (less noise).

exp one tape

	Total Pulses	Pulse width PRF sort remains	scan sorted
Digital	≈13,000	≈ 12,100	≈11,500
FM	≈20,000	≈13,000	≈10,000

Plus we went thru many successive scans and never saw a missed scan on the digital tape. (not so on the FM).

5. the locations on ~~FM~~ Digital are about 5 Time better than FM.

6. They have machine language programs instead of Fortran and run time on a scan sor[redacted] as [redacted] ...rcond.

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7. There are still large locations resulting on our data in the [redacted] band typical (33 by 15), but in "S" band they have gotten good ellipses of 7.6 by 3.0. This is somewhat due to their method of calculating the time difference but the type of solution needed I think it would take awhile! however. [redacted]
The locations still reflect ephemeris problems and Stan is going to do some checking to verify this.

8. [redacted] I think at this time we should [redacted] consider some "horse trading" namely if Stan & NSA will come out [redacted] with a message (computer) saying Field Digitizing is the [redacted] way to go. (Stan already wants to know when we can go to [redacted] with digitized tapes!) [redacted] and requesting a wider [redacted] we should consider it worth while. Howard [redacted] this [redacted] to get with. Handle via Byeman/Talent-Keyhole Control Systems Jointly

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TOP SECRET [redacted]

stan at some latter time and work some thing out and plan a number of briefings for ?Benning/navy types etc?

next Item

The transmit antenna in the & [redacted] fell over the messages I put in this stack. We did not miss a tasking mission because it went down in a quiet time and [redacted] with delayed commands picked up the Ball. (Cdr. Larque (NRO) said his Idea of going to [redacted] really saved the day! I guess he forgot about his ideas on [redacted]

next item

I talked to Pete & John (Poole) on the Aft-rack payloads and gave them some general things we would like to see: i.e. Capt. Sperburg's suggestions, and Rd. for long pulse comparisons on fixed thesholders. John [redacted] turned on he has 3 alternative block diagrams

already and may be more by now. (I think it had a remarkable effect on his attitude!) I told them we would get together later next week on the details and on getting a letter out covering these. (By the way Howard (Lorenzen) has mentioned selling these ventures as showing more depth to the poppy system (i.e. getting a look at the future ideas with ~~Bd~~ payloads). A brief list of a number of the Ideas ~~for~~ on the payloads is under these sheets.

next Item

~~Sp~~ C & D are still separating at previous rate. ~~the~~ D is around, but won't stop yawing enough to turn off pitch motor on thruster. G.E. & Pete are working on it.

next Item Hybla Valley

[redacted] is making initial ~~arrange~~ arrangements on cutting some trees, leveling ground, digging ditches, pouring cement etc. for us while he is doing his own work we have to get back to

 ate on next week with details

5

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~~For~~

next Item

The on-board calibrator (note Transit type scheme) but ~~[redacted]~~ our same inverse Doran type with a very ~~[redacted]~~ narrow band has a start, Paul [redacted] has been putting some of the hardware together. So we can get a bread board mock up for testing Looks like severest problem will be interference with D.C. Transmitters but we may want to go to another frequency.

(Retep)

We ((that's a brief run through forget one item ~~[redacted]~~ went over the Selectrix type tape format with the people at the fort and they don't see any problems and are working on it.

I will be in Pa. this weekend if you want to get in touch give me a call [redacted] or [redacted]

Hammons from Handle via Byeman Talent-Keyhole Control System Jointly

TOP SECRET [redacted]

Thanks, I'll see you Tuesday (I may be a few)