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Notes to the File in preparation for Sec Nav visit and [redacted] on 28 December 1965.....

Date for MISSION 7105 = August 15 1966, ^{slide date} still seems possible but by no means a guaranteed date because of these problem areas:

1. In Code 5170 the new Branch Head has been covering both the administrative and the Technical areas without the depth which was apparent with the total team when Dix was in the drivers seat...given another two or three months the team will shape-up if the morale problems of Overtime are solved expeditiously.

2. In Code 5435 the recent clearance of Fred Hellrich has allowed this Code to complete the "Triangle" of (a) Bird Experiment (b) Ground Station Data Collection and (c) R & D in Data Analysis and this very talented member of the team will soon be making great contributions in the areas of supporting the Analysis of the POPPY data in the other two sides of the "Triangle".

3. Ed. Becke has made a tremendous enhancement in the working level mechanical interface between Code 5170 and 5435 by solving the mechanical mounting and layout ~~xxx~~ design at a very early stage in the efforts of both Codes. His services during the past several months have had a great influence on the first two payloads and will continue through the last two payloads in the future months.

4. Continuity of the HRB Singer Contract Nonr-5041(00)(X) is a mandatory factor if the operational data of Mission 7105 is to be met. With the three men presently here at NRL under this contract, NRL has derived some significantly advanced design and development, ^{This work} which has ~~been~~ evolved through HRB plant support and ^{HRB Singer} ~~NRL~~-team ^{efforts} into the construction of the first three special purpose receivers, ^{These were} designed ~~to~~ specifically for the Data reception of this program, ^{and} ~~with~~ a resulting ^{ed in greater than a} ten-to-one improvement in the time delay and time variations of the data transition through the new receivers as compared to the old ~~RRR~~R390-A/URR receivers. ~~xxxxxxx~~

The HRB Singer Team also were instrumental in the overseas ^{and} evaluation of these receivers, ^{contributed in a very major way to evaluation of &} the general up-dating of the tape recording system necessary to support the receivers additional ^{BYEMAN TALENT KEYHOLE-COMINT CONTROL SYSTEMS JOINTLY} bandwidth, and also in the design, procurement, installation and evaluation of the new \$50K AZ/EL (Azim ^{ation}) Antenna system. ^{sample via BYEMAN} This antenna system for ^{the very first} gives the operator the choice of either vertical or horizontal polarization on the receiving antenna array with four YAGI elements each with a Gain of 11.2 db and thus the " + about 17 db. ^{Channels Only}

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horizon:

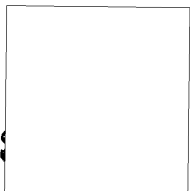
The signal on/acquisition comes up in level very quickly and increases in amplitude as the incoming range decreases and most significantly there is NO OVERHEAD SIGNAL LOSS with this antenna. The reception antenna beamwidth is about 20 to 25 degrees in width and height so operator aiming should not be a major problem if the orbit of Mission 7105 is circular and the predictions are within 30 seconds in time accuracy...an automatic aiming system could be developed but at this time it does not seem to be warranted.

5. The Servo controlled mechanism which supports the antenna array is built by Scientific-Atlanta and is capable of handling somewhat greater loads than is presented by this array. While the tapes made during the operational evaluation of the New HRB receivers have not been evaluated and won't be before the middle of Jan it was apparent during the visual observations that the receiver when used with the 100 kc bandwidth was being handicapped by inadequate signal-to-noise ratio problems which could easily be cured if the antenna gain could be increased by 3 db. To support this conviction Mr. Price has had the shop build a new antenna array with eight YAGI elements (four over four) instead of the two-over-two used for the evaluation. It is our strong recommendation that this array be rushed to [redacted] for installation and evaluation so that the essential facts of its operational characteristics and the operator and on site training and experience can be obtained in time to support the procurement of the remaining 7 systems. The first system must be purchased with 4 over 4 YAGI elements ~~xxxxxxx~~ because the pieces for it were on shelf at Sc-Atlanta and there is not enough time to get the operational data on the new array before the factory needs the array for their assembly effort.

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6. The 5435 Section is searching how they might best apply their collective and individual talents in preparation for the greatest overall utilization of Mission 7105....EOB ENHANCEMENT of the Program is the major area of our emphasis. anything which will aid in getting [redacted] in a timely fashion is our major aim...

History
Problems

In March we predicted that within six months after 7104 flew we would have a method of electrically extracting a portion of the [redacted] and transmitting it electrically via dispatch to NSA for processing. IT has not worked out as rapidly as we had planned largely due to the antenna polarization problems in the bird and on the ground and also because of the [redacted] in the birds. While we were in [redacted] this last November the Analysis (J. Martin CT2) with one hours training "Picked Off" the [redacted] OF A series of illuminations [redacted] These [redacted] were for series of illuminations which lasted over three minutes and their spread of standard deviation was equal to or better than that characteristically available at NSA from their [redacted] processed data. Several significant facts are apparent from this brief effort: (1) little training was needed by the station personnel to extract the [redacted] data, (2) The data was sent electrically to NSA (3) the data did resolve into a location, (4) this was the first and only [redacted] to result from the [redacted] intercepts in the history of these payloads, (5) this data was taken [redacted]

7. One easily says "Why not do more of this and get some valuable EOB on the Street???" Well, the signal selected was quite unique in its otherwise busy collection band so the operator could identify it

[redacted]

BYEMAN-TALENT-KEYHOLE-COMINT

Code 5435 recommends that a thorough study be made of the various possibilities of enhancing the EOB collection areas of this program and among the influencing/areas are the following:::

1. How many stations get the New Antenna system
New Receiver
New Generation Quality Control Complex
New "2nd generation BAI STATE.

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If this was the most perfect of all worlds all sites would get all versions of the new equipment but since the resources of this lab and in particular this group who will have to install and check out this equipment is a fixed and limited factor, careful consideration should be given to the possibility of trying to do too much with the limited teams available. Understand that Lee is involved with the research and development at NRL and the Plant of the second generation BAY STATE digital logic system which should eventually be able to extract a [redacted] Data stream out of [redacted] even when there are [redacted] hits... This is a Priority effort if EOB data separation is to be feasible for early 7105 ~~xxxx~~. Mark is full time involved in the generation of an advanced HRB Receiver with digital tuning and several other refinements which were not included in the first design because of the pressure of time and schedule. Jim is scheduled to make the Pacific scene. ~~xxxx~~ None of the HRB team have ever been to the [redacted] Site and there have been increasing material and logistic problem there in the last several months. The [redacted] Site has an ascending curve of importance and at the same time it has a great cloud of uncertainty about it. We need now the very best information as to the best way of up-dating their capabilities. The room which is available in the present GRD-6 bld measures about 14' x 16' could be utilized for the second generation Quality Control Area comfortably but it is difficult to see how we can utilize the new AZ/EK antennas from a HUT type collection operation especially where the Command antenna must be separate from the receiving antenna in one hut....

The estimate for the next year for the HRB contract called for two teams of two men each who would have appropriate clearances and would be available in May, June and July for the installation of the antennas at the overseas sites. In addition to this possible increase in the on board manpower, there is John Martin from [redacted] who is getting out of the Navy in Feb and who we hope will go to work for HRB. If this works out he would be a natural for the effort of designing, installing and training the [redacted] personnel in the use of the next generation Quality Control Analysis equipment. He personally has had more experience in the installation in [redacted] than anyone else and he knows intimately the strong and weak points of the individual equipments as well as the most logical arrangement into an overall complex. He can be of great value in the extensive [redacted] "Analysis" area by virtue of his experience. We only have hopes [redacted] him for about 5 or 6 months though since he wants to go on to school and get a degree.

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