

NSA Report To TOG

after NY 101

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11 May 1961

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MEMORANDUM FOR: Adm. L. H. Frost

SUBJECT: CRAB Processing

The following answers are submitted to the questions contained in your memo of 5 May, subject as above.

QUESTION: 2.a. What action is being taken to prepare standardized tapes for calibration? NML feels that this is a necessity in attacking the problem for ultimate machine solution.

ANSWER: Original calibration tapes were prepared by NML but were not adequate. New tapes now being prepared.

QUESTION: 2.b. Is it possible to standardize a format of the data to be handled?

ANSWER: Yes, it is possible to standardize the data format at each step through any of the various processes. There is no logical reason why the PEP or PFI, time, and length of individual illuminations should be expressed in three separate kinds of terms; for practical reasons, however, the most efficient terms to use for computer processing are not the same as the accepted terms used in manual processing.

QUESTION: 2.c. What can be done to acquire more "Gerber" equipment? The single equipment at NML is calibrated and is running. Air Force Sergeant Winterbottom, from COSA-5, is doing an excellent job. Will he remain with NML until no further requirement with the Gerber equipment exists? It is understood that the company that built the equipment is out of business. What is the mystery on reproducing such an equipment when we already have one model, using another contractor? NML feels it is desirable to put two shifts on the Gerber equipment at once.

ANSWER: Additional Gerber equipment can be purchased and additional people can be provided for operation if this is required. This gave into the most critical question of the moment: that is, should we reexamine our objectives with regard to the processing of the tapes from the first CRAB shot? Our efforts have been aimed heavily at developing techniques and methods to process all signals from all tapes and locate as many as possible. The SAC request and the present CMI questions would suggest that we might

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consider adding additional resources to the effort to obtain partial and piece meal results in advance of more complete solution. If this decision is made, then it may be advisable to expand the "Gerber approach." We will discuss this with OMI.

QUESTION: 2.d. What is the status of the Bausch and Lomb optical reader? Has it been calibration checked? Is it manned?

ANSWER: The Bausch and Lomb reader is manned right now. Calibration check will be completed by 20 May.

QUESTION: 2.e. What is the status of currently available Audico equipment with reference to calibrations if needed and any assistance of electronic engineers who work with [redacted] what missions have been run, if any, to check the operation?

ANSWER: The present Audico equipment, utilizing the timing tone on the tape to control the tape speed, has been found wanting in some respects due to the capstan inertia of the tape drive. MPPO therefore, is modifying the existing equipment so that the timing tone on the tape can directly determine the Audico sampling rate. This modification is expected to be completed by 16 May. Missions will then be run through Audico and Bogart which will simultaneously check the audico and provide a digital output which will be available for study.

QUESTION: 2.f. What data do we have from SAC on height-finders? Has any work been done on location of height-finders?

ANSWER: We have received from SAC "data" on height-finders which consists of a formula which was worked out empirically by Capt. [redacted] of SAC for an airborne platform. This formula assumes a sinusoidal motion of the nodding antenna, and, since the true motion is not sinusoidal, the formula is unusable for this project. Data from which the true motion can probably be determined was requested, informally, at the meeting with SAC and WRL on 2 May and SAC stated they would send to us immediately.

QUESTION: 2.g. Is it possible to proceed with the program of fixing of V-Beam radars?

ANSWER: The program for fixing V-Beam radars has been completed. We have been held up in using it by the inadequacy of signals from known locations which would permit accurate locationing of the remaining signals. Action is underway to overcome this difficulty.

QUESTION: 2.h. Do we have any program work in process for computer sort programs?

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ANSWER: Yes, the computer sort programs for isolating all radars with nearly the same PRF is written and operational. The scan-sort program for collecting all of the illuminations from each individual emitter are written and debugged. The only present problems with these programs are: (a) timing inaccuracies introduced by the present Audico servo-control, and (b) the lack of knowledge concerning the true stability of the various measurable parameters, such as PRF, scan rate, etc. Once the Audico modification is complete and the information on stability has been obtained (Mr. [] of ONI has agreed to furnish this), the scan-sort program can be made operational. It will take some time, however, to experiment with the various thresholds in order to find the best settings, before obtaining true operational status. In any case, the computer programs will always need to be complemented by some hand analysis.

QUESTION: 2.1. How many NSA personnel are cleared into this project? I understand that Dr. [] is in charge of the over-all program for the project/ Who is working with the NRL people directly or indirectly? What additional data can they provide, if any, in resolving the over-all problem of resolution?

ANSWER: 52 people are cleared into this project.
Dr. [] is in charge of the overall program.
A number of people from COSA, MPRO and PROD-03 have been working with NRL, with Mr. DeCurt, Lt. Cdr. [] Mr. Struve and Mr. Catchell being most actively involved.
Some of the data required from NRL has been mentioned in the above answers. Additional data will be requested as required.

HERBERT F. CONLEY

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SP-44712 EYE

1. Need to Immediately Reduce All Material to Hard Copy

A. Standardized tapes for Calibration Must Be Run Immediately

B. Standardized Format should be obtained as soon as possible

C. Gerber

Equipment

1. Is Running - has been calibrated - Must keep; it operating 100%
2. Must keep AF Sergeant Winterbottom on the job
3. Desirable to put two shifts on the Gerber at once
4. It would be desirable to procure additional Gerbers

D. Bausch and Lomb Optical Reader

1. It Has not been calibration checked
2. As soon as possible this equipment should be manned full time

E. Audico

1. As yet uncalibrated
2. Need for calibration and assistance of electronics engineer to work with Struve
3. Need to run full length Missions like 905 or to check the overall operation.

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2. Programing

A. Height finder Programing.

1. A program for location of height finders should be started at once
2. Data on height finders from SAC should be obtained to assist NSA

B. V Beam Programing

1. A program for V Beam fixing should be developed as soon as possible
2. Location of V Beams should be done on an immediate basis

C. Computer Sort Programs

1. NSA should assign an additional programer to work with NRL to get NSA in a position to take over the type of processing now being done by NRL computers.

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