

7. Lorenzini
Reg. No. 3268901
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MINUTES

of

Second Meeting of

Working Group to Consider NRL Proposal for an Electronic Intelligence Satellite

Convened at 0900 hours, 28715B Pentagon

6 August 1958

[Redacted] CHAIRMAN

Attendance:

[Redacted]

CDR P. W. HITE, JR., OP-300

[Redacted]

MR. H. O. LOEWEN, NRL

[Redacted]

MR. J. N. TRICKLER, NRL

[Redacted]

As agreed at the first meeting, the second was devoted to a more detailed general discussion of the problem at hand after members had had an opportunity to study the documentation and [Redacted] had visited Haller, Raymond, and Brown (HRB) at State College, Pa., and Airborne Instrument Laboratory (AIL), Mineola, N. Y., two contractors working on the ELINT aspects of the USAF LI7L program. The discussion is briefed below.

[Redacted] REPORT

The morning session was devoted to [Redacted] trip report.

Trip to Airborne Instruments Laboratory, 1 August 1958

At AIL, [Redacted] was informed that their funding had very recently been reduced from \$8 million to \$3.5 million and that this would delay their schedule at least 6 months, although they had been "accelerated" in January 1958. The original schedule called for a Mark I Ferret system to be delivered to Lockheed in January 1959 for launching in August 1959 in a 32-deg test orbit. This is consistent with previously obtained official information, dated 1 July 1958, that an engineering prototype would be tested in a low-latitude orbit in August 1959. However, it is not clear at this time whether or not the schedule dated 1 July 1958 must undergo further slippage; this schedule may be seen at OP-9235 and will be brought to all meetings. (This matter should be resolved by the forthcoming

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Air Force briefing on the LL7L which the working group is scheduled to attend. Also, [] will be visiting west coast LL7L establishments between 13-21 August and should be able to furnish up-to-date information on the schedule upon his return).

[] noted an absence of operational hardware at ALL, most items being in the breadboard stage at the present time.

Studies of expected intelligence environment for subsystems other than the Ferret (SEINT) in the 1960-65 period are being carried out by the following contractors.

<u>Subsystem</u>	<u>Contractor</u>
Photographic	Eastman Kodak
Infrared	Aerofjet
Data Processing (on ground)	Philco

The following technical details were learned at ALL.

- a. Electrochemical batteries having a life of 20 to 30 days will be used initially. Solar cells are good, but their efficiency is low (about 9%) and they require a great deal of surface.
- b. The Ferret equipment will employ a scanning superheterodyne together with automatic data processing, in digital form, on tape. It will look "straight-down" from the stabilized vehicle, utilizing the zenith mode of the radar being intercepted. In the MRL equipment, the S and X bands will be scanned successively in 18 seconds. This is in contrast to crystal-video equipment, planned for the MRL vehicle, which must look directly at the radar being intercepted.
- c. The development of equipment for interception of advanced type signals is being undertaken i.e., frequency jumping, staggered prf, and staggered pulse width.
- d. 270 nm is considered the optimum orbital altitude - expected to be maintained to within \pm 10 nm. Speed will be 300 miles/min.
- e. The Ferret equipment will scan a circular ground area of 150 miles radius.
- f. The vehicle is 5 ft. in diameter and 19 ft. long.

Trip to Haller, Raymond, and Brown, 4 August 1958

At Haller, Raymond, and Brown, which acts as an intelligence member of the team of contractors working on the LL7L, [] was briefed on much of the

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technical background of the program and provided with pertinent references which OP-92B3 will attempt to obtain. One of HRL's specific projects is to develop information for AIL and Lockheed on expected ELINT environment in the period 1960-65 for the following frequencies listed by priority.

1. 2500-3200 mc
2. 3000-10,000 mc
3. 50-120, 130-290, 290-650 mc
4. 650-1300 mc
5. 3200-5600 mc

() noted the gap between 5600 and 9000 mc)

Discussion of HRL Proposal

The afternoon session was devoted generally to a discussion of the HRL proposal as led by Mr. Tremler and Mr. Lorenson.

Mr. Tremler indicated that a satellite (ball) itself could be available before the payload of ELINT equipment (within a matter of 6 weeks) using very light antennae and solar cells which can be skin-mounted. Also, with regard to time scale, Mr. Tremler indicated that the electronics people at HRL felt that an instrumented vehicle could be ready about 1 December 1958 if the go-ahead signal were received now. With this schedule in mind, he gave the following information about the status of component development.

- a. The interrogation receiver has previously been developed in the Vanguard program and weighs 3 or 4 ounces.
- b. The timer, for turning the ELINT receiver off, has been developed.
- c. The filters between the antennae and amplifiers have not been developed. They will employ printed circuits and are not expected to create a problem.
- d. *development*
Antennae for the satellite is well along.
- e. The modulator, proportional stretcher, and transmitter are being studied.
- f. With regard to ground equipment, it appears that special antennae and receivers, together with better recorders will be required, but these will not create technical problems.

CDR Hitz raised a number of questions pertinent to the operation of the National Technical Processing Center (NTPC) in processing the satellite data. The HRL members agreed, in answer to these questions, to provide the time required for and cost of obtaining every portion of necessary equipment.

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The following pertinent items were also pointed out in the discussion:

a. Transmitting and collection sites for the proposal are now in existence, including Army and Air Force sites which could furnish assistance.

b. The present minitrack stations in the U. S. could be used for tracking purposes.

Members agreed to submit to the secretary written text related to the preliminary report outline which is attached herewith; this was to be done on or about 21 August 1958 if possible.

The next meeting will be held in Room 4A666 on 21 August 1958 at 0900 hours.

Respectfully submitted,

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OUTLINE

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Statement of problem, or proposal, together with summary of conclusions.

State requirements which NRL proposal can fulfill. At this time it might be desirable to at least outline all ONI electronic intelligence satellite requirements prior to NPRO.

Show how the NRL proposal can uniquely meet these requirements sufficiently in advance of any other proposal or, how it can fill gaps in the coverage of any other proposal. (This will entail a discussion of the time scales and technological difficulty of all proposals).

The following tabular presentation is suggested for use at an appropriate place in the report:

NRL Proposal		Other Proposal
single function	versus	multiple functions
simplicity	versus	complexity
early capability	versus	later capability
relatively inexpensive	versus	relatively expensive

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