~~TOP SECRET~~

~~TOP SECRET~~ LIMITED D[redacted]UTION

PROJECT GREB

HISTORY

This project was developed on the following accelerated schedule:

9 March 1959	Concept proposed by SECNAV to ARPA
29 April 1959	ARPA recommended SECDEF approval
13 July and 18 Aug 1959	Approval requested from President by SECDEF
24 August 1959	President approved the project
23 June 1960	GREB launched as a piggy-back payload on Transit II
6 - 7 July 1960	Satellite checked out against U. S. radars on the West Coast
9 - 25 July 1960	Check-out and initial experimental collection against Sino-Soviet radars.
18 Septembler 1960	Commenced 3rd operational phase-continued check-out and scheduled completion of initial experimental collection on 3 November 1960
28 September 1960	Failure of classified portion of project
30 November 1960	Attempt to launch another satellite failed with failure of 1st stage of TRANSIT III A 2nd stage and GREB package destructed by AMR range safety officier.

OBJECTIVE AND MISSION

This project was established to fill the joint requirements of the intelligence agencies. Within the Navy, the project was under the sponsorship of the Office of Naval Intelligence and was developed by the Naval Research Laboratory. Operational control was exercised through the Technical Operations Group TOG with the Naval Security Group responsible for the actual operations.

~~TOP SECRET~~ [redacted]

~~TOP SECRET~~ SPECIAL HANDLING
HANDLE VIA
BYEMAN REQUIRED
CONTROL SYSTEMS ONLY

TECHNICAL OBJECTIVES

a. To determine the signal environment in S-band (2600-3250) mcs within the Sino-Soviet Bloc. This information, correlated with other intelligence, will assist in the development of medium and long term indications of hostilities.

b. To determine the locations of known types of high-powered operational military S-band emitters in areas of the Sino-Soviet Bloc not now accessible to U. S. and friendly collection resources. This will extend the present Electronic Orders of Battle in their coverage and provide new planning information for future probes and, if necessary, for intermin targeting.

c. To determine the locations and major emission characteristics of unknown and unique high-powered S-band emitters in the Sino-Soviet Bloc in order to locate and identify centers of Communist electronic R and D activity and increase the intelligence lead-time on new techniques and equipment.

d. To obtain information which will aid in the development of more sophisticated processing techniques and intelligence applications. Oncoming projects, such as the U. S. Naval Radio Research Station and SAMOS, should benefit from the lessons learned.

SECURITY AND SECURITY CONTROL

In compliance with specific order of the President, security control of the project has been exceedingly strict. This was the result of the security compromise of an earlier similar project, TATTLETALE. Disclosure of the existence and details of the project is on a strict need-to-know basis and security oaths are required from all those granted access.

The true nature of the project and its associated codeword are classified "TOP SECRET - SPECIAL HANDLING REQUIRED".

COSTS

The total cost of the project through 1 December 1960 exclusive of boosters, was about 1.1 million. An additional 3.5 million has been made available to continue work on the project.

~~Top Secret~~ [redacted]

~~TOP SECRET~~ - LIMITED DISTRIBUTION 6 December 1960

PROJECT GRAB (U)

PROCESSING SUGGESTIONS BY [redacted]

1. At this stage, there are really two conflicting problems. The first is to get a usable intelligence product from all the missions in a quick time period, certainly in time to help ADM LOWRANCE and ONI support further such effort. The other is to see how a few techniques can work and what the real intercept capability of the system is practically. I am skipping the automation side of processing which, for my view, is too far off to produce any results by the time we need them.

a. Get an accurate illumination count per minute for each completed mission. Give collection co-ordinate at the beginning of each minute used, and height along with this data. DeCOURT has started a few girls on this and indicates that accuracy of about ten percent is possible readily for each time element. Please do the Sunday mission at any early date comparing it with week-day one, and day contrasted with night.

b. Eliminate all signals with prf's from [redacted] pps and go through each mission processing all other signals. This would permit improvement of processing time by a factor of at least 4:1 even with present people according to my best qualified advice. This will still leave all the important low prf signals which could be of Soviet origin--the [redacted] with [redacted] prf's, potential naval types with [redacted] GAGE-[redacted] if they appear and any high prf candidates which might possibly appear for a few illuminations or a hit, such as [redacted] families and others.

c. Process any odd ball that appears in this process if there is a fair chance it might be Soviet, very carefully. Emphasize those most probably Soviet over those highly ambiguous.

d. Complete all signals from a single mission as now being done.

e. Determine the longest time period a single signal was noted in the process as indicated above plus what has already been done -- continuous time without drop out, signal type and mission.

f. Note the longest continuous time period a single [redacted] signal is heard as contrasted to others. Note this on each signal type other than the [redacted] on which fair samples are already on hand.

g. Attempt to locate individual signals by the following techniques to see if it can be done on a selective basis:

(1) back geometry on a V-beam
(2) back geometry on nodding [redacted]
(3) utilization of the rotation rate

Copy 3 of 3 copies
Page 1 of 2 pages.

~~TOP SECRET~~ -
LIMITED DISTRIBUTION

~~Top Secret~~ [redacted]

Handle via BYEMAN control only

Top Secret [redacted]

What is the potential accuracy of each of these techniques in position determination?

h. Continue with NRL assistance and on own to develop any more rapid read out techniques. Please make full use of the NRL talent. I have a tremendous respect for Howard LORENZEN, Reed MAYO, Bob MISNER and many others. They are down there to help. Use them.

i. Please carefully note all prf's above [redacted] indicate time of illumination and log them -- measure as accurately as possible -- even within 100 cps. Tabulate them.

j. Above all, we want to know what the system can do and cannot do.

2. My sincere regrets that I have no brilliant ideas. But, I think a few of these simple thoughts may help the COSA-5 problem with which we are duly sympathetic.

/s/ [redacted]

Copy to:
Mr. H. DeCOURT (NSA-COSA-5)

Handle Via BYEMAN control system only

Top Secret [redacted]

~~Top Secret~~ [redacted]

~~TOP SECRET - LIMITED DISTRIBUTION~~

6 December 1960

PROJECT GRAB (U)

REVIEW OF INTELLIGENCE SUMMARY BEYOND THAT ALREADY REPORTED

1. New Signals:

a. An interesting complex-pulsed, somewhat unstable transmission with a mean prf of about [redacted] pps has been carefully analyzed. Thus far detected on a single mission, it is my personel opinion at the moment that it is a malfunctioning radar. I also believe it is very likely coming from [redacted] The incident proves we can detect such complexities readily, which is important.

b. I am very concerned about the numbers of [redacted] pps signals we are getting. These signals are characteristic of U. K. radars, particularly of the [redacted] radar, but also of some older less powerful sets. It should be remembered that the signal with the steady illumination, previously reported, had prf's in this range. To our knowledge, up to this time, the Soviet bloc has not utilized an S-band radar with this prf. Such prf's if ever suspected Soviet in origin, would thus definitely represent new equipment. Such a prf would give unambiguous range greater than that obtained from the common Soviet EW radars. The Soviet height-finders occasionally have prf's having (possibly malfunctioning) down to [redacted] pps. The [redacted] height-finder has a [redacted] pps prf. Otherwise, we have no Soviet bloc S-band signals with a prf this low.

c. Odd illuminations of other radars are found irregularly. These include prf's thus far up to about [redacted] pps. None of these are yet attributable to uniquely recognized Soviet equipment or potentially new Soviet equipment.

2. Recognized Signals:

a. All the radars of the TOKEN/[redacted] as far as they can be differentiated, have been noted. On occasions, both beams of V-beam have been detected, violating earlier predictions. This indicates rather good beam-shaping in the Soviet antenna, more power, or more receiver sensitivity than expected, probably a combination of all these factors.

b. The [redacted] height finders are observed with same frequency. Both [redacted] and [redacted] pps rates are noted with the standard nod rate of about [redacted] seconds. It was not anticipated that these would be heard. This indicates that some of them at least must be radiating at least in the [redacted] region of power. These signals are not believed to come from periphereal areas alone, by any means, either.

Copy 3 of 3 copies.
Page 1 of 2 pages.

~~TOP SECRET~~
~~LIMITED DISTRIBUTION~~

~~Handle Via BYEMAN control system only~~

~~Top Secret~~ [redacted]

~~Top Secret~~ [redacted]

c. There is little else new to report. Contrary to earlier advice, we have not detected GAGE-[redacted] signals. This checks with rather haphazard results from operation [redacted] This indicates probable abandonment of these radars in any key air defense role.

3. Location of Radar:

a. A sizeable success was obtained on two rather unique TOKEN-type signals with odd prf's, derived from [redacted] cps rather than [redacted] cps power. Determination of location by this means alone checked with prior determination by other means, within 50-100 miles. The second signal was actually verified by this collection program in the Northeastern region of [redacted]

4. Signal Density:

a. Little can be added to prior report other than to affirm that the Soviets have plenty of S-band radars in all areas operating at all times. Certainly they have more equipment active in this band than do we, of significant power. And, for that matter, so apparently does [redacted] as well.

[redacted]

Copy to:
Mr. H. DeCOURT (NSA-COSA-5)

~~Top Secret~~ [redacted] ~~Handle Via BYEMAN Control System Only~~