U. S. NAVAL RESE
WASHING

BYE-057432-99

IN REPLY REFER TO
5100-33:CEC:wdw
GKR:

TOP SECRET

From: Director, U. S. Naval Research Laboratory
Washington 25, D. C.
To: Chief, Bureau of Naval Weapons

Subj: Navy Astronautics Program Support Requirements

Ref: (a) BuWeps ltr RTOS-1-SHH Ser 05375 of 3 April 1962

1. This Laboratory desires to provide the in-house capability supporting the expanded Bureau of Naval Weapons astronautics program as referred to in reference (a).

2. The satellite payload capability at the Laboratory has been built up slowly over the past three years operating on an interim basis without an assigned personnel ceiling. This tenuous arrangement has continued for lack of firm support for a permanent capability. The satellite program has been on a launch-by-launch basis with extremely short planning periods.

3. The existing capability is insufficient for the current schedules, an excessive amount of overtime being required to meet launch dates. Further, the operation has been on a marginal basis with essentially no back-up. Thus within over-all Laboratory commitments and without adding new facilities and personnel two launches a year of the COMPOSITE type would be reasonable. At least a six months lead time is essential.

4. By January 1963 the capability to support four launches a year of the COMPOSITE type could reasonably be provided. This capability is limited by the ability to recruit and train personnel and assumes an early determination to proceed, otherwise the required personnel cannot be obtained in time. With a firm indication of fiscal support, a relief of personnel ceiling restriction and adequate launch vehicle assignments it is anticipated that this Laboratory could expand the satellite work to provide the payload fabrication, systems integration and field support necessary for the Bureau of Naval Weapons program.

5. This Laboratory has enthusiastically supported the satellite development for the Solar Radiation and LOFTI programs based on the need for new information in these areas and the excellent results of the first satellite in each program. The vehicle

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failures for SR 2, SR 4A, LOFTI 2, and SR 4B place both programs in a precarious position. The reliability of the Thor Able Star was barely acceptable, and the recent shift to the Scout vehicle while it is in the development stage appears to be even less acceptable. For the Laboratory to build up the enthusiastic support of a large effort on satellite development the productivity of scientific information must be greatly improved. Plans for NRL satellites on Scout vehicles should be deferred until the Scout has demonstrated improved reliability. The accelerated program can be accomplished using known techniques and existing hardware only if every effort is expended toward the early procurement of Thor Able Star vehicles for COMPOSITE type launches.

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DEPARTMENT OF THE NAVY
BUREAU OF NAVAL WEAPONS
WASHINGTON 25, D.C.

IN REPLY REFER TO
RTOS-1-SHH
Ser 05375
APR 3 62

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1000
1100
4000
5000*
1000-4
1525
1522
4010

From: Chief, Bureau of Naval Weapons
To: Director, Naval Research Laboratory
Washington 25, D. C.

Subj: Navy Astronautics Program Support Requirements (U)

1. The Bureau of Naval Weapons is examining the Navy's in-house capability of supporting potentially large increases in Astronautics Programs activity. To this end, it is of interest to this Bureau to determine the Laboratory's capability of supporting substantial increases in astronautics activities while maintaining the engineering excellence that has characterized NRL satellite work to date.

2. The BuWeps anticipates a potential requirement for payload fabrication, systems integration and field support necessary to permit as many as five COMPOSITE type launch operations per year. While some payloads from other sources may become available for launch by this means, it is expected that possibly twenty (20) satellites of the Solar Radiation, LOFTI and SURCAL types could be required on a yearly basis. In addition, this Bureau has been approached by activities outside the Navy with requirements for payloads that can best be met by the type of satellite engineering and fabrication in which NRL has pioneered. Although the scope of this additional work is unknown at this time, payloads of this nature plus development of new types of payloads to meet evolving Navy requirements may further increase the level of this activity at NRL.

3. To assist the Bureau of Naval Weapons in planning for program activity of this nature, it is requested that NRL provide guidance in the following areas:

a. Within over-all Laboratory commitments and without adding new facilities, how much of the indicated program can NRL support and on what time scale?

b. How much of the total indicated program can NRL support on a continuing basis by 1 January 1963?

A preliminary reply at an early date is requested.

Aug 3054/09

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ONR, Wash. 25, D. C.
CNO (Op-76), Wash. 25, D. C.

Assistant Chief for Research, Development, Test and ~~Evaluation~~ ~~CONFIDENTIAL~~ CONFIDENTIAL

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DOWNGRADED AT 3 YEAR INTERVALS.
DECLASSIFIED AFTER 12 YEARS.
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DEPARTMENT OF THE NAVY
BUREAU OF NAVAL WEAPONS
WASHINGTON 25, D.C.

IN REPLY REFER TO
RTCS-1-SHH
Ser
05375

APR 3 62

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[illegible], Wash. 25, D. C.
[illegible], Wash. 25, D. C.

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ROUTE SHEET
PRNC-NRL-10-863d (Rev. 6-54)

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CODE	DATE	INITIALS	*PURPOSE	REMARKS
~~5400~~ 5430				Copy
5436	8/16	[illegible]		Held for H.O.C.

Unclassified
[illegible] 1/10/63

INSTRUCTIONS

Prepare 2 copies of this route sheet and forward ALL copies together with necessary correspondence and other documents.

*PURPOSES

1. FOR INFORMATION
2. FOR APPROVAL
3. PREPARE REPLY
4. PREPARE ENDORSEMENT
5. FOR NECESSARY ACTION
6. FOR SIGNATURE
7. RETAIN ENCLOSURES
8. RETAIN COPY

NAVY-DPPO PRNC, WASH., D.C.

FROM: 3100

DATE OF MATERIAL: 3 Apr 62

BRANCH IDENT. SYMBOL:

ORIG. IDENT. SYMBOL (Mail Room Fill in):

SUBJECT: Navy Astronautics Prog Support Req.

DIVISIONS DO NOT FILL IN

DATE MAILED

FILE NO.

R/S NO. (Mail Rm. Fill in)

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~~TOP SECRET~~ [redacted]

BYE-057376-99 1

WORK SCHEDULE

NRL

(1) Print from 512 inches per second records (4" x 5")

(2) Check duplicating 512 inches per second records

(3) Prints of simulated data (about 12)

(4) Explanation of simulated data and instrumentation
Comparison with flight data and hardware

(5) Conclusions of Signal PRF
Conclusions of Signal RF

NSA

(1) Location

(2) Signal parameters [redacted]

This might pertain to [redacted] analysis from probe 2 intercept 6/7/61
This stuff could be as late as 1962 no earlier than 10/30/61 since it mentioned in but summary Titan was [redacted]

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WORK SCHEDULE

NRL

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Conclusions of Signal RF

NSA

(1) Location

(2) Signal parameters

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BYE-057389-99

ABSTRACT

Since the tapes from the Navy's Project DYNO are of an analog form, the National Security Agency and the Navy have been applying manual analysis techniques to certain unusual signals found on the DYNO tapes. The National Security Agency has found one signal of unique characteristics which possesses many of the parameters necessary for a sophisticated radar of the type used to detect and track ballistic missiles.

Of the hundreds of orbits of the DYNO Sattelite which have been interrogated for ELINT readout, so far this signal has only appeared on two of the orbits.

Based on a joint analysis of the National Security Agency and the Naval Research Laboratory the signal parameters are as follows:

Its frequency lies in the lower band of the DYNO Satellite which is 550 to 620 Mc. The signal consists of approximately - pulses at a pulse repetition frequency of between cycles per second or possibly twice this frequency. The high of approximately per second. One antenna scan consists of a total of of these groups. The antenna scan rates have a period of

BYE-057389-99

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ABSTRACT

Introduction

Signal Parameters

(a) Frequency

Loc

(a) Positions and Time of Orbits

(b) Postulated Location

Summary

(a) This could be one of the Radars of the Hen House Collection

(b) It could be an Acquisition radar

APPENDIX

(1) Comparison of Actual and Simulated pulse bursts

(2) Discussion of Location

(3) Statistical Record of Events

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INTRODUCTION

The Navy's DYNO II Satellite was launched June 1961 and covers two frequency bands 550 to 620 Mc and 810 to 920 Mc. To differentiate between signals in the two bands pulses from the lower frequency band are stretched to ~~100~~ 150 microseconds before retransmission and those of the higher band to ~~200~~ 350 microseconds. Since the tapes from Project DYNO are analog reproductions of the signals heard, the National Security Agency and the Navy have been carefully rescanning all the tapes utilizing manual methods of analysis on those unusual signals found on the tapes. Normally DYNO tapes are processed by machine readout techniques developed by the National Security Agency and the conventional radar signal data are reduced [redacted] to an intelligent product. The National Security Agency in their work on the tapes have found one signal having very unique signal characteristics. The parameters of this signal are of type which would be radiated by a sophisticated radar system used to detect and track ballistic missiles.

The National Security Agency after scanning most of the DYNO tapes using manual methods so far have found the signal only on two orbits of some several hundred interrogated.

The DYNO Satellite is designed to respond pulse for pulse to signals received in real time. However, this unusual signal had pulse repetition rates much higher than the conventional radars, therefore, [redacted] repeat the actual signal pulse for pulse. To accurately analyze the signals recorded from the satellite the Naval Research Laboratory using actual Satellite and Ground Station equipment simulated all possible signal combinations to allow the best engineering estimate of the acutal signal received by the Satellite. Data found in the enclosed report shows typical reproductions of the signal as recorded by the field stations directly and the characteristics simulated at the Laboratory. The National Security Agency has also done e[redacted]ve analysis of the signals recorded from the

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Satellite and has confirmed the conclusions reached by the Naval Research Laboratory in their analysis.

BAND 550-620 [redacted]

No of Pulses [redacted]

PRF

GRF

Scan

Scan

MON: 2 or more AUDIO (1/4") DUBS 3 3/4 ~~7 1/2~~

FIX — MOST INTERESTING FIRST
Make prints of all if available

approx. 4x5 photos of 20 or so most interesting traces:

TIME
PRF
Sig. strength

NP — 4000-7500 14000 about 10 in all

WP — 2000 — 3000 area about 4 in all

actual data — about 10 representative samples

~~Select all~~ [redacted] — select 10 or

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