

BYE-059310-94

~~TS~~

### DISTRIBUTION INFO

R.D. Mayo  
NTFR

BYE-059310-94



24 January 1972 Alternative available for a Program which offers a Dedicated Ocean Surveillance Capability instead of POPPY.

1. Minimum cost and minimum complexity Option:

Single constellation per orbit plane.

Bird data links do not exceed number of site data channels available.

Use available site systems for,

Receiving

Recording

Timing

Digitizing

SEL-86 Processing system (Under development).

No stored command

Must provide some Ephemeris Improvement scheme such as

ON\*board ranging (bird-to-bird)

Standard Frequency oscillators (Timation like)

Retep

Grid of Emitters as Geopositionable reference from which to correct ephemeris and thus refine it.

RF Coverage sufficient to of itself, preclude encryption by virtue of data content disclosing nature of mission.

RF Coverage not as important as the R&D Aspects of Triplet where Full range of technology should be used to provide the greatest manifestation of the virtue of Triplet over the doublet. Thus the Ephemeris improvement, and the fullest use of the Delta-T sort.

A- Studies which must be made:

Relative merit of 52 minute and 104 minute revisit times

Relative merit of 2 vs three bird clusters

In triplet, what is the range of separations desired?

With these separation what are the range of accuracies anticipated as the mobile bird moves through its elliptical path relative to other (Reference) Birds?

Bye 059 310-  
-94  
Cyl

~~TOP SECRET~~

Processing of POPPY, Past, Resent and Future:

From the beginning of the program now known as POPPY, the Processing of data has been the responsibility of the National Security Agency.

Initially it was the National Technical Processing Center (COSA-5) who ~~before this mission~~ [redacted] ity. The first spacecraft was under heavy Presidential restraint and was only used operationally for twenty-two data collection orbits. The data whowver was of such extreme density that it could not be analyzed by the conventional equipment and techniques then employed for radar analysis by COSA-5. NRL designed an instrument which was used to digitize this data and at the same time, provide the PRF resolution and radar antenna-scan measurement as well. This first processing effort in many ways forecast the efforts which have taken place during the past <sup>in data collection efforts</sup> eleven years where NRL has/outstripped the eapabilities of NSA to process the data. Periodically the processing accomplishments have been so anemic that NRL has risen to the assistance of NSA. Notabily this is what occurred in late 1966 when in the face of the Harry Davis/PSAC Review of the ABM resources, ~~xxxxx~~ NRL and NSA were on opposite sides in the proposal to exploite the up-coming Mission 7105 for the ABM Search by the addition of a primitive Geographic Location Sort capability. History will show that the first DOG House intercept was made in the first week of operational use of this Mission and of secondary importance the first [redacted] was found during this week. Several Months later the first [redacted] signal was found by this same Mission and thus the major elements of the Soviet ABM resources were found by this mission. Thus/~~was~~<sup>were</sup> ushered into being, the first significant results of this mission using a ~~xxxxx~~ ground-station data reduction system that made the analog to digital conversion of the data At the Site. A small process controller (computer) was added to the site to provide the required Quality Control on these A-to-D processes. The addition of the A-to-D data converter to the Site

has ranked with the [redacted] outstanding innovations to the Program since

~~TOP SECRET~~

2. The development of the site processing system has progressed with magnificent neglect by NSA and now that it has progressed and their efforts have waned, they are willing to join in our success even to the point of exercising their historic role of "Processing responsibility".

~~TOP SECRET~~ [redacted] understood that we do not argue their right, just their capability and now they are determined to move some of their key people into the contractor scene where our software systems are being developed. [redacted] If their entry is one of requesting "How can we help?" [redacted] they can become sufficiently informed to employ the rental computer (which will in a year be) located in the basement of NSA. There is the opportunity for NSA to exert an extremely distracting and diversionary influence at the contractor plant by having these personnel wear their NSA Hat and inadvertently or deliberately assume the part of the "Scientific Officer" on the ONR Contract. This is the sole prerogative of R.D. Mayo of NRL. ~~AND~~

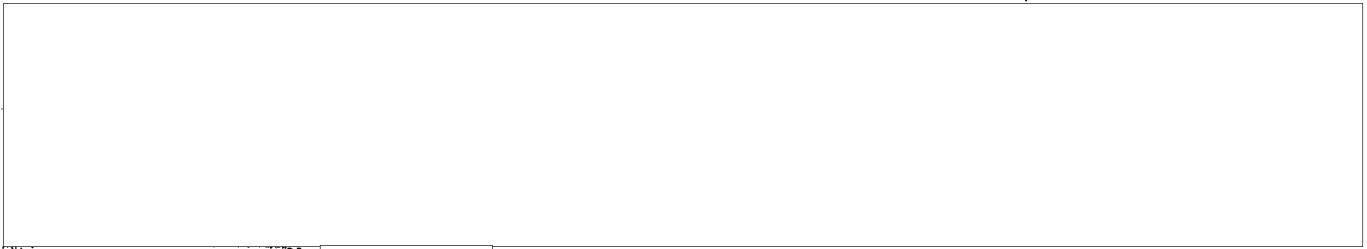
[redacted] This brings into focus the main subject of this paper and that is, the alternatives ~~xxxxxx~~ processing philosoph<sup>ies</sup> that are ~~is~~ now under consideration for the Second Generation computer system.

1. Extension of the Present system... Isolation of the SOI and treatment in a serial fashion through geopositioning.

2. Starting at the point where the present system can not be expected to cope with the Real-Time processing steps.

The main difference between these two philosophies lies in the willingness to continue to use the SEL-810/PDE to do the first part of the job while the second part of the SEL-86 software system is developed. The First part of this is to do the SEL-810/PDE job that has now been demonstrated. There seems to be some disenchantment with this philosophy but it is suspected that it is the wisest course of action since at least it will provide the community with a working system at the earliest possible time. Of course there are other criterion such as maximum-cost effectiveness or minimum cost but these seem to fade to insignificance if [redacted] software system thus developed, will not work.

~~TOP SECRET~~ Five years of software development to date and the ~~HALLOWEEN~~ ~~BYEMAN~~ ~~CONTROL SYSTEM ONLY~~ success, must be testimony enough to take our judgement on the future.



~~TOP SECRET~~



~~TOP SECRET~~



HANDLE VIA BYEMAN  
CONTROL SYSTEM ONLY



~~TOP SECRET~~



~~TOP SECRET~~



HANDLE VIA BYEMAN  
CONTROL ROOM ONLY