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NATIONAL SECURITY AGENCY
FORT GEORGE G. MEADE, MARYLAND 20755

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RADM F. J. Harlfinger, USN
Assistant Chief of Naval Operations
(Intelligence)
The Pentagon, Room 5C572
Washington, D. C.

Dear Fritz:

Prior to receiving your message, dated 17 March, regarding COMINT and ELINT [redacted] and the general role of ELINT satellites for ocean surveillance, we convened a study group composed of several members from NRO, NSA and Navy (PM-16 and NSG) to consider the details of ocean surveillance using satellites. This group is primarily concerned with the means that the surveillance requirements can be met by technology as they estimate the requirement for this surveillance. Their effort will inevitably be frustrated without a better joint understanding of these requirements.

Your suggestion that several "OPS" become involved strikes me as an excellent way that we might address, conclusively, in a joint way, the requirements aspect of the problem. As you know, I have always felt that requirements should be worked out between the consumer and the supplier in close communication.

As I suggested in my recent letter to ADM Zumwalt (inclosed), I feel the Navy should take the lead with NSA and NRO in developing the role for ELINT satellites. I strongly recommend that you include the study group that we have already convened with the group that includes the "OPS" and that the resulting committee be formally charged with developing Navy requirements for these expensive resources.

With warm regards,

/s/ NOEL

NOEL GAYLER
Vice Admiral, U. S. Navy
Director

Incl:
a/s (NSA-BYE-18326-71)

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ADM E. R. Zumwalt, jr., USN
Chief of Naval Operations
The Pentagon
Washington, D. C.

Dear Bud:

The attached memorandum provides our strategy for the use of ELINT from satellites for ocean surveillance. You will note that it features:

a. A mix of satellite systems. Some of this mix would be essentially dedicated to the ocean surveillance function; the advantages of others require dependence upon non-dedicated systems.

b. Recognition of the essential part tasking, processing, and communications capacity play in overall system viability. The requirements for processing investment argue conclusively against distributing the processing investment over several sites over a wide geographical distribution.

c. The need for continuing dialogue about the real operational requirements and the system or financial constraints working against their satisfaction.

I feel the Navy should take the lead with NSA and NRO in developing further the role for satellites in ocean surveillance and the implementing actions which logically follow.

With warm regards,
/s/ NOEL

NOEL GAYLER
Vice Admiral, U. S. Navy
Director

Incl:
a/s

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MEMORANDUM FOR THE RECORD

SUBJECT: Ocean Surveillance by ELINT Satellites

1. The general state of understanding of the ocean surveillance requirement and the role which satellites might play is not sufficiently complete to fix on a complete satellite system design at this time, but it is possible to outline the principles and primary characteristics of a set of systems which can serve as the basis for continued iteration of design.

a. The following elements of program philosophy should obtain:

(1) Ocean surveillance should be an extension of Sino-Soviet surveillance. The NRP assets should be the base satellite program for ocean surveillance. Additions and modifications may be necessary but fundamentally within a unified program.

(2) Ocean surveillance should be achieved through a multiple of sensor systems.

(3) The role of satellite ELINT is twofold; more precise location than HFDF and SOSUS, and an additional or alternate means of detection.

2. The mix of ELINT satellite systems is arrived at through the following rationale:

a. Low orbiting satellites with the capability to "look down and locate" such as the P-11/P-989 systems offer significant advantages.

(1) They are relatively inexpensive.

(2) With proper design, each can cover the whole surface of the earth in time, and the time between observations of any part of the world can be reduced simplistically by adding satellites and associated data handling capacity.

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(3) Each can independently locate an emitter which is on for only a short time, provided that transmission is during the period of viewing for the satellite.

(4) Traditionally, these satellites are of the store-and-dump variety not requiring local readout facilities. Provision for limited, non-destruct readout to a shipborne station is conceptually feasible and should be examined to determine if the price in weight and dollars necessary to achieve this capability is warranted.

b. These low orbit satellites also have significant disadvantages:

(1) They are deployable against any specific area of the globe only a small percentage of their orbit time. This forces the probability of intercept of low duty cycle transmitters to be small.

(2) The same orbital characteristics make the time between successive looks at a particular location unacceptably large for a single satellite system for many scenarios.

(3) Their observation opportunities can be easily predictable by the target and he can take steps to avoid detection.

(4) To remain modest in expense, the on-board capability must be carefully limited.

c. Conversely, high altitude systems have these characteristics:

(1) They are basically long-dwelling in nature and do provide the capability to observe an area over an extended period of time.

(2) Their observation times are not completely driven by orbital characteristics. The point of observation can be managed appropriate to the situation and operating priorities.

(3) They are expensive and generally require a multiplicity of users and requirements to be justifiable. This dictates that any high altitude satellite contribution to ocean surveillance must be provided from programs not totally dedicated to that function.

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3. -From these considerations, the satellite ELINT contribution to ocean surveillance should be based on a mix of systems in the following priority order:

a. An essentially dedicated and specifically designed low orbit, P-11 type, spin-stabilized satellite. This satellite, maintained to assure at least one in orbit at any time, would augment those satellites designed for Sino-Soviet land-based targets. It could be expected that it would have some capability for denied area use and that those satellites tailored to denied areas would also add to the satisfaction of ocean surveillance requirements. To the extent practical, on-board processing and storage to permit limited non-destruct readout to local platforms should be a design objective. Fundamentally, however, the system concept should not require readout local to the target area and would be best managed by a single, coherent processing, reporting and collection management system. This would permit better coordination with other satellite sensors and non-satellite systems.

[redacted]

c. Continue to employ POPPY as a back-up capability and for its different and complementary characteristics. The basic strength of this program is simplicity and long life (although latest launch had

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short life). As a locating system it is slow and must be overly distributed in geography. It should be exercised and depended upon as a back-up to the "down-looking" low orbit and the synchronous altitude systems for those periods of time when one or more of these systems is not operating.

4. To achieve any reasonable composite system, it is essential that the Navy, NSA and NRO collaborate in its definition. We have only recently begun to realize technical and operational dialogue on this subject, and there is need for a great deal more. Even so, the above concept for satellite surveillance system for ocean-going targets can serve as a useful model against which to measure specific system proposals. Some specific initiatives which should be taken now include the following.

a. Demonstrate an improved tasking, processing and reporting system for satellite ELINT for the Mediterranean and its approaches. A test such as this is presently being developed by W4 and A81 using selected passes of STRAWMAN.

b. Continue to develop with NRO and Navy a system definition for a dedicated ocean surveillance P-11 satellite "ROSALI".

c. Design and implement the data handling and communications capacity necessary to process and distribute these low-orbit system results to command activities.

[redacted]

e. Pursue vigorously the objective of downgrading the classification of satellite-derived ELINT to SECRET. Successful implementation of this idea will make the satellite systems much more convertible into tactically useful assets.

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