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From: Chief of Naval Operations
To: Assistant Director for Naval Communications (Op-30G)
Director, Naval Research Laboratory (Attn: Mr. Lorenzen)

Subj: Comments on Proposed Requirements for Surveillance of Soviet Earth Satellite Vehicles; request for ~~(C)~~

Encl: (1) Space Vehicle Surveillance Requirements dtd 7 October 1958 (S)

1. Enclosure (1) contains a statement of objectives and supporting intelligence requirements proposed as an initial step in the preparation of a National Space Surveillance Plan.

2. This statement has been the subject of preliminary discussion by the Ellint Committee and will be given further study at future meetings.

3. Comments concerning the Ellint aspects of the plan are solicited and should be forwarded to CNO (Op-922Y1) prior to 13 January 1959.

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7 October 1958

SPACE VEHICLE SURVEILLANCE REQUIREMENTS

I. PURPOSE

A. These requirements constitute preliminary national objectives of the intelligence community under a national plan which, in part, would obtain information leading to an assessment of intentions of foreign nations and their activities and capabilities in the outer regions of the earth's atmosphere and in space.

B. These requirements are based on current knowledge of space technology and to that extent include all current needs of the intelligence community. Unquestionably, future developments in space technology will necessitate changes and expansion of the requirements.

C. The requirements also provide guide lines for the initiation of research and the development of new or improved intelligence collection mechanisms which are essential to obtain information for present and future assessments of foreign space activities and to the development of improved requirement statements.

II. SCOPE

A. "Space vehicles" as contemplated in these requirements are considered to be man made objects or an association of objects passing through the outer limits of the earth's atmosphere or beyond the atmosphere into space. These vehicles can be controlled or uncontrolled and manned or unmanned. Trajectories could be orbital around the earth or penetrate deeper into space. Earth recovery may or may not be programmed. Carrier or propulsion rockets for space vehicles are considered.

B. These requirements do not include consideration of high trajectory missiles or upper atmosphere test rockets unless they should fall into orbit around the earth.

III. PRIORITIES

A. As a first priority, the intelligence community requires on an immediate basis all information which would contribute toward a

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determination of the nature [redacted]pose of the space vehicle in order that ~~key government officials~~ [redacted]efense organizations could be advised. This would include the majority of information available immediately prior to and for a few hours after launch (e.g., physical characteristics, electronic transmissions and frequencies, orbital or trajectory data, etc.). The early information will also assist in setting in motion various special collection activities.

B. For a continuing period after launch, basic data and results of interim analysis indicating the nature and purpose of the vehicle are urgently required for confirmation or revision of early assessments.

C. Over an extended period, data and analysis results on all aspects of the space vehicle including scientific findings are required on a routine basis (e.g., propagation studies, particle densities in space, quality of the foreign scientific instrumentation, etc.).

IV. STATEMENT OF INTELLIGENCE REQUIREMENTS FOR SPACE SURVEILLANCE PLAN

A. Imminence of Launch

Minimum data required regarding imminence of launch are:

1. That a valid operation may be impending or underway.
2. Purpose of operation.
3. Nature of vehicle to be launched.
4. Time and place of launch.
5. Degree of launching success.

B. Physical Characteristics

1. Information on, or which would contribute to, an estimate, or a determination of the following characteristics:

   a. Weight and dimensions

   b. Configuration

   c. External appendages, antennae, etc.

   d. Material of construction, thickness, etc.

   e. Equipment components

   f. Arrangement of components

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g. Structural arrangements

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2. Particular emphasis is placed on the continuing need for photography of these man made objects of sufficient quality to permit accurate determination of sizes, tumbling and spinning oscillation, colors, composition and component materials.

C. Orbital or Trajectory Data

1. The following information based on continued surveillance of each in-flight object, with maximum possible accuracy, from time and place of launch to time and place of flight terminus.

a. Detection, as soon as possible after launch; for orbital vehicles, preferably no later than the first pass.

b. Determination of trajectory or orbital elements of each in-flight space vehicle as soon after launch as possible.

c. Orbital or trajectory predictions as far in advance as possible, to assure continuous knowledge of all space objects at all times.

d. Prompt and continuous reporting of changes in orbital and trajectory elements (i.e., altitude and particularly abrupt changes in orbit which may indicate a secondary propulsion source capable of effecting major changes in orbital path).

e. Flight characteristics and changes (i.e., stabilized, tumbling, rolling, etc., and changes thereto).

f. Atmosphere re-entry predictions to include time and place.

2. The type of equipment used for surveillance and the degree of accuracy should be indicated as appropriate when information is submitted.

D. Signal Monitoring

The complete reception and recording of all electromagnetic and guidance signals, telemetry and other forms of instrumentation signals is desired, including those associated with launching, tracking and commands (triggering, etc.). Continuous reception and recording of these signals (with a band-width compatible with that of the transmitter) is desired to allow complete read-out of technical parameters.

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E. Scientific Readout

1. Acquisition of information to permit determination of the methods used for:

a. Instrumentation

b. Launch guidance

c. Tracking

d. Remote control

e. Data acquisition, transmission and telemetry

2. Acquisition of information to permit determination of:

a. Variety of experimentation (e.g.; biology; insolation; air density; temperature; pressure; meteorological parameters; space and atmospheric composition; UV, X, cosmic, auroral and wave propagation; meteorites and meteorite dust; gravity; geodesy; navigation; relativity; electrostatic fields and electron density).

b. Accumulated or stored data either from direct or indirect readout.

c. Indicators of new or unusual experiments and results.

V. SPACE ORDER OF BATTLE

A. Mission - Timely accomplishment of the following:

1. Determination of existence and type of all militarily effective in-flight space vehicles.

2. Accurate identification of points in space through which any such space vehicle is passing at any given time and dissemination of this in sufficient time to permit counteraction.

B. Specific Requirements

1. The following specific additional items are necessary for accomplishment of the Space Order of Battle mission:

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a. Purpose of space vehicle - military or scientific - and its capabilities.

b. Manning of vehicle, and, if manned, details concerning personnel, facilities, supply, etc.

c. Existence of weapons systems, and details concerning position, method of attachment, physical characteristics, method of launching, type of control, guidance, etc.

d. Reconnaissance, purpose, equipment, methods of interrogation, control readout, etc.