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~~(S)~~ NATIONAL RECONNAISSANCE OFFICE

WASHINGTON, D.C.

THE NRO STAFF

August 30, 1968

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MEMORANDUM FOR DR. FLAX

SUBJECT: DOD Policy on NASA's On-Orbit Astronomical Experiments

Problem:

To develop an official DOD security attitude toward NASA's on-orbit astronomy program.

Background:

On April 4, 1966 Mr. Charles Schultze, then Director, Bureau of the Budget, and Dr. Donald Hornig, Director, Office of Science and Technology, wrote to Secretary Dean Rusk, asking him to study the policy relationships between NASA's proposed reconnaissance-type projects and the activities of the National Reconnaissance Program. Among the items suggested for study was the matter of orbital astronomical experiments. The NSAM 156 Ad Hoc Committee was called into session to respond to this request, issuing its final report on July 11, 1966. The report responded to a number, but not all, of the questions raised by the Schultze-Hornig memorandum. Among the omitted items was that pertaining to astronomy. The lack of attention to the problem of on-orbit astronomy is understandable, since the main thrust of the policy discussions centered on the impact of earth-sensing activities.

On August 5, 1966, Dr. McMillan proposed regulatory procedures and definitions to Dr. Seamans in an effort to establish some measure of control over NASA's reconnaissance-like activities. The definitions, agreed to by Dr. Seamans on August 24, specified meaning for the terms "activity" and "reconnaissance-like sensor." In addition Dr. McMillan referred to "other possible activities that would be of technical interest..." including the "development or test of pointing, tracking, and stabilizing techniques or systems to be used with satellites bearing high resolution

sensors, in which the pointing accuracy is better than 20 microradians or the unstabilized rate is less than 20 microradians per second."

Dr. McMillan's definitions and expressions of interest appear practically verbatim in the charter of the Survey Applications Coordinating Committee, with the text reading as follows:

> Pointing, tracking, and stabilizing techniques or systems of interest to the NRO are defined as those in which the pointing accuracy is better than 20 microradians or the unstabilized rate is less than 20 microradians per second.

On September 19, 1967, Mr. Helms approved and released the report of an NRO-sponsored committee which had been asked to examine Recommendation No. 7 of the NSAM 156 Ad Hoc Committee's Final Report of July 11, 1966. Recommendation No. 7 stated that "The Director of Central Intelligence, in consultation with the Director of the National Reconnaissance Office, should review and establish appropriate security restrictions on cameras and other sensing apparatus and equipment which can be made available for NASA's program of non-military application of satellite earth sensing." The "Recommendation 7 Committee's" deliberations extended far beyond this specific task, going on to such subjects as the vulnerability aspects of commonality in command and control systems, the problems surrounding a gradual easing of the 0.1 milliradian limitations, security problems raised by the use of radar sensors, and recommended security procedures to be used in developing finer-than-0.1-milliradian satellite-borne astronomical equipment. The report made these comments on satellite-borne astronomy:

> The matter of the use of earth orbiting spacecraft equipped with optical telescopic devices for astronomical observation also poses unique problems, because such activities will require the use of extremely high precision optics, technology related thereto having been actually pioneered by astronomical scientists. It is the opinion of the panel "that optical and spacecraft technology and technical requirements for telescopes for stellar and solar observations, are of a degree of significant similarity with NRP high resolution optical systems, as to warrant the development of a security guide for such activities similar to that prescribed under project UPWARD."

Shortly after this paper appeared the DOD members of the Survey Applications Coordinating Committee began to receive inquiries from the NASA members regarding NASA's on-orbit astronomy program. The inquiries showed a rather uniform apprehension over a possible DOD attack on the program. At the Manned Space Flight Policy Committee meeting of November 28, 1967, Dr. Seamans raised similar questions, such as "How does the present security policy relate to NASA's planned astronomical telescope?" It was suggested that the NRO prepare a clarifying paper on this subject.

Current Status:

Following the November 28 meeting, the NRO Staff requested NASA, through the DOD SACC members, to furnish information on NASA's on-orbit astronomy program. It soon became clear that the program was in a surprisingly tentative state with very limited funding. Up to this time, we have not been furnished a program; rather, we have reviewed a set of NASA Research and Technology Resumes, most of which indicate a hoped-for funding in later fiscal years.

The thing we did learn from the resumes was that NASA's astronomy program is pure, classical astronomy and is quite separate from projects devoted to the "reconnaissance" or mapping of other planets. We have no reason to be apprehensive over this program, politically or technologically. In fact, if NASA followed the Recommendation No. 7 Committee's finding (quoted above) and drove us into an UPWARD-like arrangement for producing "telescopes for stellar and solar observations," we would be the first to recant and call for recission of the "policy." The unlikelihood of NASA's doing this is reassuring, but does not exempt us from the need to respond to Dr. Seaman's original question (still carried as an action item by the MSFPC secretariat).

It seems reasonable, at this time, (1) to correct the impression created by the Recommendation No. 7 Committee's report, (2) to assure NASA that our interest in its on-orbit astronomy program is benign, and (3) to find some way to do (1) and (2) without activating ponderous negotiations with other governmental agencies. We believe this can be done by steering away from attempts to create "national" or "interagency" policy. Since the forcing factor is DOD attitude, it seems simple and logical to reassure NASA, within the MSFPC framework, with a statement of DOD policy on NASA's on-orbit astronomical experiments.

A proposed DOD policy paper is attached. I have coordinated it with Colonel Lew Allen and Mr. John Kirk (the other DOD SACC members) and they agree with the approach and the content. If you also concur, we will ask John Kirk to coordinate the paper with Drs. Wilson and Foster.

Recommendation:

That you concur in the policy paper as suitable to DOD and NASA needs and purposes.

PAUL E. WORTHMAN
Colonel, USAF

# DOD POLICY ON NASA'S ON-ORBIT ASTRONOMICAL EXPERIMENTS

## Background:

There has been a question, from time to time, as to what Department of Defense security policy applies with regard to NASA's on-orbit astronomy experiments. The question is particularly pertinent to the DOD's coordinating actions in the Manned Space Flight Policy Committee and the Survey Applications Coordinating Committee.

While the NASA on-orbit astronomical* program is largely in a formative stage at present, there are indications that this activity will increase. It would be in the common interest of both the DOD and NASA to have a clear statement of security guidelines as soon as possible. Until such a statement is developed at the national level, it is essential for the DOD to develop its own policy to guide its actions relative to the NASA program.

## Factors Bearing on the Policy:

The following factors have been considered in arriving at a DOD security policy on NASA astronomical experiments:

1. The NSAM 156 Ad Hoc Committee's concern, as reflected in its July 11, 1966 statement of policy on NASA earth-sensing activities, was aimed exclusively at the political problems of satellite reconnaissance of the earth. On-orbit astronomical experiments were not considered.

2. The charter of the Survey Applications Coordinating Committee contains this statement: "Pointing, tracking, and stabilizing techniques

*"Astronomical" is used throughout this paper in the classical sense, pertaining to the science of stars and other celestial bodies, dealing with their size, relative position, motion, composition, etc. It does not refer to the "reconnaissance" or mapping of celestial bodies.

or systems of interest to the NRO are defined as those in which the pointing accuracy is better than 20 microradians or the unstabilized rate is less than 20 microradians per second." Although it is generally agreed that the charter was drafted to assist in the regulation of image-forming earth-sensing activities, the literal application of this phrase would affect the bulk of NASA astronomical experimentation.

3. On-orbit astronomical experiments should, in themselves, present no international political problems to the Department of Defense.

4. The products of on-orbit astronomical experiments should present no international political problems to the Department of Defense.

5. It is possible, in some cases, that the astronomical instrumentation used by NASA may be NRP-developed or derived from NRP-sponsored technology. Such technology will usually require special security protection, particularly if it infers radical advances or breakthroughs in NRP equipment or techniques.

6. It is also possible, in some cases, that astronomical instrumentation used by NASA may be a component of a sensitive non-NRP military system (for instance, guidance gyros practically identical to those used in U.S. ICBMs). Such technology will require special security protection.

7. The presence of an astronomical experiment in earth orbit may evoke demurrers or protests from those overflown nations which do not understand, or perhaps wish to misinterpret the nature of, the experiment.

Policy:

In light of these factors, the following DOD policy will apply to NASA's astronomical experiments.

1. The DOD will recognize space-sensing astronomical experiments as intrinsically non-provocative to the international community and therefore outside the security guidelines derived from existing NSAM 156 Ad Hoc Committee policy documents.

2. The DOD will continue to protect the NRP, its hardware, and its technology from unauthorized disclosure. Similarly, the DOD will protect sensitive non-NRP hardware and technology from unauthorized disclosure. In order to determine what protection is to be afforded in both cases, as regards NASA's astronomy experiments, the DOD will request that all these experiments be coordinated, in both the conceptual and developmental phases, with the Survey Applications Coordinating Committee. Specifically, the SACC members will:

a. Review the NASA program for possible inferences regarding sensitive NRP/military hardware and techniques.

b. Develop security protection recommendations for any sensitive NRP/military developed or derived instrumentation which may be used for astronomical purposes.

c. Anticipate possible international reaction, particularly regarding earth-orbital space-sensing flights and make suggestions for muting that reaction insofar as possible.