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11 April 1962

MEMORANDUM FOR: Director of Central Intelligence

SUBJECT : Soviet Knowledge of US Reconnaissance Satellite Programs

1. Statements by Soviet officials and articles in the Soviet press and publications reveal only such specific knowledge of the US reconnaissance programs as has been readily available from open sources in the US press and technical journals. Such information relates to the SAMOS and MIDAS in considerable detail and in lesser degree to the DISCOVERER series although the relationship between these three are clearly described. Specific details are included such as the size of an object on the ground that can be identified from the photography, the method used in recovering the photographs, the organization for processing the photography as well as for incorporating the results in SAC target folders for bombing missions and missile crews.

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3. In view of Soviet monitoring of the programs and their ready access to voluminous technical information in the US press and technical publications there can be little doubt of their knowledge that photographic reconnaissance is being accomplished. It is considerably less likely that they have knowledge of the quality and resolution of the photography which is being obtained.

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Soviet Ability to Acquire Knowledge by Monitoring the Vehicle During Its Flight

4. DISCOVERER II may possibly have been recovered by Soviet personnel on Spitsbergen. Evidence is not conclusive but the capsule apparently landed on Spitsbergen and was not recovered by US or friendly personnel. This capsule was equipped for biomedical experiments but contained no live specimens. In the event that Soviet personnel recovered the capsule it contained no equipment or photographic film which would have disclosed a reconnaissance capability.

5. Soviet recovery of any future capsule in this series is unlikely. Only by a combination of complete system malfunction and their own good fortune could the Soviets recover a capsule. A Soviet attempt at triggering the de-orbiting process might possibly prevent US recovery but would not accomplish descent on Soviet territory.

6. Vehicle transmitters and receivers are active during orbit only when within range of US tracking stations. Any signal sent by Soviet ground stations would be detected by US stations and could be negated. Even if a successful eject command was sent by the Soviets the capsule would descend into the Pacific and sink.

7. Soviet monitoring stations can intercept telemetry broadcasts during the time the vehicle is in range of US monitoring stations. Telemetered data contains information relating to the results of various publicized experiments such as radiation level measurements. Telemetered data also relates to the functioning of various components and equipment but does not contain intelligence data relating to the reconnaissance mission.

Information Revealed in Open Soviet Sources

8. A lengthy article by G. Zhukov titled "Space Espionage Plans and International Law" which appeared in the Soviet monthly journal, International Affairs, published in October 1960 includes specific details which have appeared in US open sources.

9. The following excerpts are pertinent quotes from US publications:

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"The SAMOS system is scheduled to become operative in 1962. The plan is to put a number of these spy satellites into a polar orbit to keep the territory of the USSR and the other Socialist countries under constant surveillance."

"Available lenses and TV equipment will make possible photographs equivalent to what can be seen from an altitude of 100 feet."

"Its functions will be to spot missile launching pads, airfields, industrial plants and any massive build-up of Communist military equipment."

"The SAMOS project is closely related to the development of military MIDAS satellite ..... The main purpose of the latter is to keep the earth under observation with instruments sensitive to rays emitted by hot gases formed during the launching of rockets."

"SAMOS satellites detect missile bases, MIDAS will register the launching of missiles."

"Closely related to SAMOS and MIDAS is the program for employing DISCOVERER satellites for intelligence purposes. DISCOVERER satellites are intended to solve the problem of bringing containers with photographic intelligence back to earth."

"The main purpose of the DISCOVERER program was to perfect the launching, orbiting, and retrieving of the sky-spy containers."

"SAMOS II was launched on 31 January 1961. However, the satellite's equipment worked for only two weeks and its capsule with photographic equipment could not be returned to earth."

10. The Soviet publication, Aviation and Cosmonautics, for January 1962 has an article, "American Spies in Space". This article presents details on the firings, orbits, missions, and other details concerning SAMOS, MIDAS and TIROS.

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Other Information Available from US Press Sources

11. Exhaustive details are available in Aviation Week and Space Technology relating to the manufacture, performance characteristics and construction details, including photography of components, of the AGENA vehicle which launches SAMOS, MIDAS, and DISCOVERER. Missiles and Rockets reporting on the launching of SAMOS III stated that:

"Its polar orbit will carry it over the Soviet Union at frequent intervals. Ground stations will be able to turn its camera on by radio as the satellite crosses Russia or other points on the earth surface.

"Such a flood of photographs is expected from the camera carrying satellite that a photoanalysis unit at the Air Force test center at Sunnyvale, California is being enlarged by between 30 and 50 people. It will go on a three-shift working day to process photographs of Russia.

"At the same time a photo unit will be activated at Strategic Air Command Headquarters, Offutt Air Force Base, Nebraska, to undertake target-planning activities from the SAMOS photos for use by Strategic Air Command bomber and missile crews.

"A UPI story stated that the SAMOS satellite actually would be of greater espionage value than the MIDAS. The SAMOS, which sends televised pictures back to earth, can detect a missile being set up on the ground, even before a launch.

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Estimated Soviet Knowledge Based on State-of-the-Art

13. Soviet scientists have the technical base for accomplishing anything the US has achieved to date in the field of photography. Their accomplishments in the field of optics, camera geometry, films and film processing are as good as those of the US and in some instances better. They have not had the experience in building camera systems such as have been built and tested by the US and therefore may not have learned certain techniques now familiar to US technicians.

14. Soviet scientists apparently were impressed by the high quality of photography recovered from the U-2 in 1960. Statements by Soviet officials and scientists subsequent to this incident bear out the impression that there was surprise at the information being collected. Extrapolating from this knowledge of our technology in 1960 to what we might now be accomplishing in satellite vehicles, Soviet scientists can readily calculate that our capability in this field can now accomplish photographic resolution of objects 10 to 20 feet on a side.

15. There is no conclusive evidence that this scientific knowledge of our potential capabilities is being accepted at face value by Soviet leaders. There are, in fact, some indications to the contrary in that we have not detected any significant attempts to camouflage or otherwise conceal their sensitive targets such as ICBM or other installations from US surveillance by satellites. Soviet protests have emphasized the "illegality" of satellite overflights of Soviet territory but these do not indicate the degree of concern which might be expected if they accept US capabilities at a level which Soviet scientists can establish by rather simple extrapolations. There are indications that Soviet developments of radar and other detection capabilities may be aimed at intercepting or otherwise interfering with satellite overflights. However, until such an attempt is made it cannot be definitely established that these developments are aimed solely against reconnaissance satellites.

16. Should there be photographic equipment aboard the latest Soviet satellite which is crossing the US the USSR may be proving out photographic techniques which will better enable them to assess US accomplishments in this field and cause them to increase their degree of concern.

ROBERT AMORY, Jr.
Deputy Director/Intelligence

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