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MEMORANDUM FOR: SA/PC/DCI - Mr. Bissell

SUBJECT: Aerial Reconnaissance of the U.S.S.R.

SUMMARY

1. Aerial reconnaissance of the U.S.S.R. may be accomplished in the predictable future by three methods: overflights, balloons and an earth satellite. Research and development on related projects is interrelated and complementary. Since these projects are rapidly advancing to operational stages several major problems are raised that concern the entire intelligence community.

2. This paper reviews the projects that show most potential at this time. Each of the three areas is summarized in three sections: present status of related projects; a discussion of the problems and implications of the work for the entire intelligence community; and suggested actions for the Director of Central Intelligence, which entail two basic decisions and several minor problems.

3. The first major question is whether or not the pioneer reconnaissance promised by balloon operations (Project GRANDSON) should be supplemented with specialized aircraft overflights. The indications are that the type photo reconnaissance of most value to the intelligence community requires overflight operations. If so, the production of suitable aircraft should be encouraged and plans should be made concerning photo requirements, priorities, and possible political repercussions of overflight operations.

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4. The second question is whether or not an earth satellite vehicle (Project FEED BACK and others) offer cold war gains that would justify launching a general purpose satellite on the first suitable occasion, the International Geophysical Year, 1957-58, being a unique opportunity. If so, tentative requirements should be established as soon as possible.

* * *

INTRODUCTION

1. The value of intelligence based on direct observation of the Soviet Union is self-evident. There are three methods now being studied that may enable direct surveillance of the U.S.S.R. by photographic or electronic means. They are: (a) stripped or specialized aircraft, (b) balloons, and (c) an earth satellite vehicle (ESV). As projects dealing with these devices advance, several issues of importance to the entire intelligence community are raised:

a. Do current projects for direct observation of the U.S.S.R. promise to fill the requirements of the intelligence community; should they be revised, or encouraged; or should new projects be designed?

b. What requirement and priority problems are raised as the above projects reach operational stages?

c. What provisions are being made to process fully and quickly any information that is obtained?

d. What preparations are being made or should be planned to take full advantage of cold war benefits to the U.S., if a satellite project materializes before a similar Soviet project, and how important are these benefits?

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f. Does the immense potential of overflight operations as a means of collection intelligence for the entire intelligence community justify encouraging the production of a few specialized, high performance aircraft?

STRIPPED OR SPECIALIZED AIRCRAFT

STATUS

1. Overflights with conventional, stripped aircraft have certain operational limitations which usually permit intelligence collection on only the peripheral areas of the U.S.S.R. and her satellites. Operations with this type aircraft have been generally utilized thus far in support of ground clandestine operations, gathering ELINT information incidental to their mission, and overflights of the Operation FERRET and LAROP type. Maximum reliability and safety of overflight reconnaissance of interior areas of Russia would probably require specially designed aircraft.

2. In the past year the Air Force requested plans from Bell, Lockheed and Martin for reconnaissance aircraft for special missions over the U.S.S.R. Lockheed produced complete designs for an aircraft designated the "CL-282".

3. The CL-282 is of radical design. The fuselage is based on an existing fighter but has a specially designed nose to carry the required cameras. The gas tanks have been integrated into the large, gliderlike wings to increase take-off strength. It uses a skid

landing device. [redacted] 25X

[redacted] 25X

25X1 [redacted] Lockheed was very enthusiastic about the plane and promised delivery of one model one year from date of order. However, Air Force technicians concluded thatthe ship did not have a large enough safety factor to authorize production.

4. A second aircraft, a stripped-down version of the reconnaissance Canberra (RB-47), has been suggested by Martin Aircraft. It would have [redacted] 25X

months from date of order. Existing modified Canberras are the most readily available, high performance reconnaissance aircraft. 25X1

5. Several other projects are still in the research phase, but do offer other possibilities. Guided missiles and [redacted] are examples. This survey has not studied them in detail because their reliability and capability have not yet been determined. The [redacted] 25X

25X1 [redacted] high performance aircraft have also been omitted, but should be considered in any overflight planning.

DISCUSSION

1. Although it is believed that the Air Force has ordered a few modified Canberras, under current plans they will not receive a suitable aircraft in time to observe the 1955 Kapustin Yar missile launchings. If national policy and requirements had been clearer on the overflight problem, it might have been possible to obtain photographic intelligence on Kapustin Yar next year.

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2. The advantages and the problems of overflight missions have been under consideration for some time. The Air Force fully appreciates the necessity for intelligence that can be gathered by overflights for both its own mission and the mission of the intelligence community. However, the Air Force is justifiably cautious because of two aspects of overflight missions:

a. The Air Force correctly takes the view that the openly hostile character of extensive overflight activity has political ramifications and risk which should be recognized and accepted at a high level before USAF takes on the operational problem. Unless this issue is clarified they are undoubtedly very hesitant to increase overflight activity. The political consideration of overflights should include not only the impact within the Soviet sphere, but also repercussions on our allies, the neutralist states and popular opinion in the United States.

b. The Air Force cannot risk personnel, expend funds and material, unless the intelligence gain is clearly and authoritatively established. Research and development activity on specialized projects outside their assigned mission requires full justification. They now have two projects (GRANDSON and FEED BACK) underway to accomplish aerial reconnaissance which do not involve some of the hazards of overflight. In addition the Air Force standard safety and engineering requirements for aircraft are very high, making the production of limited use, highly specialized ships difficult and expensive.

3. There are four groups directly concerned with overflight activity, whose interrelation is not clear, although on a working level they are

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probably well known to each other. They are the NSC, the JCS Rainbow Committee, the AFOIN subcommittee 1-A3, [redacted] 25X1

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ACTION

1. The Air Force would certainly welcome any further clarification or political sanctions in the development of national policy on overflights.

2. Although both strategic and defensive airpower as well as the entire intelligence community urgently need photographic and ELINT reconnaissance of the U.S.S.R, the Air Force is not prepared to lower its operational standards unless a directive comes from a very high level. If this is done, the overtly hostile nature of overflights and their impact on the cold war is clearly outside the Air Force mission. Also, DDP/PP officials of this Agency should formally establish liaison in order to be fully informed and prepared for the cold war effects mentioned above. The Air Force would undoubtedly welcome assistance.

3. Within its mission, the Air Force would definitely have difficulty justifying the production of a limited number of highly specialized aircraft. However, the Air Force would undoubtedly cooperate fully in such a venture if the need is established by a higher authority and funds made available.

4. As a result, U.S. overflight policies and plans should be based on the expected success of other attempts at direct observation. If the proper agency, which would probably be the IAC, feels current sources and plans are sufficient, no action is suggested.

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5. If it appears advisable to extend overflight activity, a decision on the production and operation of a specialized aircraft should be made at a level that would eliminate confusion in the USAF. The NSC is the sole organization with the authority to consider its many aspects. To get decisive action on any changes the Agency might propose in either plans or policy, NSC action will be required, although it would be best if the parties most directly affected were first informally consulted.

6. From the interest of the Agency, specialized aircraft overflights are essential to obtain completely adequate photo intelligence of strategic areas of the Soviet Union. Pioneer reconnaissance as planned by Project GRANDSON (see below) will require subsequent detailed photography to get adequate scale, resolution, stereo-overlap and controlled coverage. Consequently, it is to our interest to encourage the authorization of special aircraft that can take detailed, large-scale photos immediately, once the pioneer reconnaissance is done. Such aircraft would have to be ordered now if they were to be available for immediate use upon receipt of Project GRANDSON's results, assuming the project progresses as planned.

7. This Agency has levied one specific requirement on the Air Force for photo reconnaissance of Kapustin Yar. This request is still in channels and will require an overflight.

BALLOONS

STATUS

1. The Air Force has a "Balloon Pioneer Reconnaissance System", Project GRANDSON, that is scheduled to become operational in October 1955, though launchings may be delayed. The project plans to provide wide area

search of the U.S.S.R. using primarily photographic techniques, but is also adaptable to ELINT electronic devices. GRANDSON is currently in research and development stage and is being supervised by Col. John Kay, Air Research and Development Command. Operational plans are being prepared by the Operations Planning Group, Headquarters, USAF, under Colonel Russell Berg. Operational responsibility will rest with the Headquarters Command, USAF, under Brigadier General Ross. A final decision will probably be made by the NSC, if GRANDSON has not already been considered.

2. Requirements are for 3,000 balloons, which allows 500 spares. It is planned that they will be launched [redacted] 25X1 [redacted] at a rate of ten per day. About 7 days will be required for the balloons to cross the Soviet Union. They can stay aloft from 8 to 9 days. At 155 degrees East longitude the VHF code signals begin and a recovery operation is planned using C-119 cargo planes. It is estimated that of all those launched 75%, or 1875 balloons, will cross the U.S.S.R. and that 40%, or 1000 balloons will be recovered. With each balloon carrying two cameras with 500 feet of film, and a recovery figure of 40%, it is estimated that processing could be required for about 1,400,000 photographs.

DISCUSSION

1. Because the intelligence that this projectpromises to collect is of widespread interest to the entire intelligende community, arrangements should be made to process, interpret, and distribute the photos most expeditiously. Two processing studies are underway. The Air Force Cambridge Research Center has a contract on this problem with the Boston University Photographic Research Laboratory and ORR/D/GP has gathered data in support of OSI interests.

2. Since the course of the balloons cannot be controlled, the problem of requirements and priorities does not arise until the first results have been received. At that time this Agency may wish to place some priorities in processing, especially if this is to be a lengthy operation. Also, if it is decided to construct some specialized aircraft, priority should be given to the photos over areas selected for subsequent detailed overflight reconnaissance.

3. The impact of this operation on the cold war should be anticipated and be softened as much as possible. As indicated above, it is almost certain that about 25% of the balloons will be recovered within the Soviet Union--a problem that may not yet have received exhaustive Air Force consideration.

4. As in the case of overflights, GRANDSON provides the Soviet Union with a powerful cold war weapon. Any cover we might provide should be thoroughly investigated. 25X1

25X1 [redacted] The suggestion has also been made to conduct the project overtly and provide some scientific data for international use. The cover problem has already received some consideration by the DD/P.

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6. In OSI conversations with Air Force their full cognizance of the vital importance of this project to the entire intelligence community was most evident. General Samford not only knows our interest but also very firmly expressed his own personal determination that the project was going to satisfy the entire community's requirements. This very cooperative attitude has been verified in talks with Mr. Fred Ayer, Mr. Trevor Gardner, General Putt, General McCormack, General Schriever, and Colonel Kay. Consequently, it is expected that the Air Force will be most receptive to any suggestions that we might have to offer.

7. The reconnaissance that this project would provide is important enough to merit every encouragement and assistance we can provide. Anything we can do to expedite GRANDSON should be offered to the Air Force as soon as possible.

ACTION

1. Since Project GRANDSON has progressed almost to completion under Air Force auspices, our interest should be stated tactfully and inoffensively. However, in view of the otherwise unobtainable information that may be procured, it is even more important that the interest of the entire intelligence community be clearly established and that this project operate as successfully as possible.

2. Indications are that the Air Force will certainly take a cooperative view and appreciate any guidance or help we may offer. The IAC is probably the most appropriate agency to consider the problem of priorities in processing GRANDSON photos. Any subsequent exploitation of the results by overflights, which would require authorization for a special aircraft, would have to come from the NSC. Once the members of

the IAC are cognizant of the operation, each can be prepared to take immediate and full advantage of the pioneer photographs. However, because the project is so far advanced, it seems advisable that a responsible representative of this Agency should first discuss the matter informally with appropriate Air Force officials.

3. The DD/P has established liaison with Air Force intelligence officials to provide any possible cover and to prepare for propaganda repercussions based on balloons recovered within the U.S.S.R.

EARTH SATELLITE VEHICLE (ESV)

STATUS

1. Research and development in this field is not fully coordinated and secondary to guided missile projects, though the leading authorities are undoubtedly in frequent, informal contact. The position of the military seems to be that they cannot justify large efforts in this direction in terms of their own mission but they are keenly interested. They would probably do the work if funds were available and a requirement was established outside the Department of Defense. Nearly all of the components of a successful launching now exist though no Servide has apparently carried a project beyond planning stages.

2. The main Air Force effort is centered on Project FEED BACK, a small, 100-pound satellite designed to provide television reconnaissance of the U.S.S.R. for a period of several weeks. Most of the basic studies were made by the Rand Corporation (R-262, edited by [redacted] advance copy in OSI). FEED BACK requires a two-stage rocket vehicle based on the ATLAS missile to reach an orbit of about 300 miles altitude. Project FEED BACK would take about seven years to complete subject to

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final development of the ATLAS missile. Presently available guidance and television systems would suffice. The development and launching of the first FEED BACK satellite is estimated to cost $160 million. The satellite would circle the earth every 90 hours, obtaining television pictures at the rate of 100,000 per day or more. Within a few weeks it could cover all U.S.S.R. territory of interest to U.S. intelligence agencies.

3. In the last two months the Air Force Requirements Committee has established a requirement for FEED BACK on the recommendation of the Secretary of the Air Force. Colonel Cooper and Colonel Cleveland, Office of the Assistant for Development Planning, Deputy Chief of Staff, HQ, USAF, are familiar with these plans and Lieutenant Colonel Genez, HQ, ARDC, has been working with the Rand Corporation.

4. A second major satellite proposal has been made by Dr. Werner von Braun, Technical Director, Guided Missile Division, Redstone Arsenal. In about 24 months or less he believes it would be possible to launch a 10-pound satellite in orbit using the REDSTONE missile for the first stage plus LOKI rocket clusters for the last three stages. All elements required for this satellite are currently developed and in production. Dr. Von Braun's other schemes are quite similar but are designed to use the advanced REDSTONE missile which will not be available until 1956.

5. The third major satellite proposal has been made by Dr. Fred Singer, a consultant of ONR and Associate Professor of Physics at the University of Maryland. His Project MOUSE plans to launch a 100-pound package in an orbit 200 miles from the earth. He would utilize existing Army rockets. Dr. Singer minimizes the military value of

MOUSE which he envisages to be used primarily for gathering basic scientific data. He is particularly interested in launching the satellite for the International Geophysical Year, 1957-58.

6. The Navy has also shown great interest in ESV proposals. It is believed that they currently have several ESV studies underway. Very recently ONR obtained consent from the Army to use the REDSTONE missile, which indicates they are thinking along the lines suggested by Dr. Singer.

DISCUSSION

1. The establishment of priorities should be considered, probably in the IAC, although the satellite would remain aloft long enough and would be sufficiently invulnerable to make this a secondary problem. As in the other projects, preparations should be underway to process the information for the entire community's use.

2. Since balloons and overflights promise to provide aerial reconnaissance of the Soviet Union sooner than ESV, the main benefits of launching an earth satellite would be prestige and constant surveillance. It should be clearly understood that a small ESV launched at an early date to reap cold war benefits would gather only basic scientific data and would not have reconnaissance value.

3. As the cold war progresses each major scientific advancement takes on magnified importance. The satellite will certainly be the greatest scientific advancement since the hydrogen bomb. This contribution to psychological warfare is of direct interest to the entire intelligence community, not only because of the positive contribution, but also because of the importance of embarking on this project with

overtly peaceful intentions. Hence, it may very likely be in the national interest to promote existing plans from a very high level in order to make certain that the United States does not suffer a major cold war defeat.

4. The International Geophysical Year, 1957-58, offers a unique opportunity. The event has the necessary prerequisite of international organization and recognition, both to assist in the operation of the projedt and to present it to the world in a favorable light. A missile launched during that year would be used solely to gather scientific data concerning communications, meteorology, cosmis rays and aerodynamics. It would be presented in an atmosphere of scientific progress and brotherhood that would minimize the propaganda value to the U.S.S.R. If the U.S.S.R. should choose to attempt countermeasures to such a satellite, it would put itself in a position of opposing the progress of the international scientific community. In addition a successful launching would reaffirm the superiority of Western values and methods in the world of science, which have been questioned in view of the rapid Soviet scientific advancement.

5. The launching of a small satellite in 1957 or 1958 would not handicap the success of FEED BACK. FEED BACK is designed to record and transmit its television data using tape, which is transmitted on receipt of a codedsignal to stations in North America (via a high frequency, directional beam). As noted above, it is doubtful whether or not they would attempt to counter an international project and, if they did, it is equally doubtful whether they could be effective. The U.S.S.R. could learn very little from simply observing the passage of a small satellite.

ACTION

1. It is proposed that the DCI consider sending a letter to the President (draft, Attachment 1) recommending that a tentative requirement be established for the development of an ESV in the International Geophysical Year under the overt sponsorship of the National Science Foundation. The letter should be accompanied by a short explanation of the ESV problem (Attachment 2), and of the Soviet/U.S. stage of ESV development (Attachment 3). As is stated in these attachments, it is most important that ESV development for international purposes be as free as possible from any military onus as well as inter-service rivalry. Once the great importance of ESV in the cold war is strongly stated, our role will be filled and it will remain for the suggested scientific bodies to proceed.

2. A decision must be made by the end of this year if we are to try preparing an ESV by 1957. A brief study made by experts in this field, which would include such men as Dr. Von Braun, Dr. Singer, Dr. Du Bridge, Dr. Killian, and Dr. Vannevar Bush, could determine the feasibility of this project very quickly. If the project is received favorably and is completed before a similar U.S.S.R. project, interested elements of this Agency should be advised to prepare to take full advantage of our achievement and to counter expected Soviet accusations.

3. If the President established a tentative requirement for a small ESV in 1957-58, it is suggested that the select scientific group be appointed by the Scientific Advisory Committee of ODM which would determine the feasibility of the project in conjunction with the Department of Defense and the National Science Foundation. The Foundation

would be a suitable sponsoring agency and official U.S.representative for international liaison and planning. The Department of Defense would be responsible to them for developing an appropriate ESV for launching in the International Geophysical Year. It is believed an ESV could be launched without violating the security of our missile development.

4. If it is decided not to push launching of a small satellite by 1957-58, the present plans of the military should suffice to produce an ESV suitable for constant surveillance in the period 1960-65. However, the Soviet Union also possesses a similar capability and could succeed in putting an ESV in orbit before the United States does. Because the U.S.S.R. has very little difficulty in collecting the intelligence an ESV would produce,by more direct methods, her gain would be almost completely in prestige and publicity.

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