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CENTRAL INTELLIGENCE AGENCY
Washington 25, D. C.
Office of the Director

19 August 1960

MEMORANDUM FOR: Brigadier General Andrew J. Goodpaster

SUBJECT: Statistics Relating to the U-2 Program

1. Total holdings of processed film are 131,047 feet of 70 mm "tracker" film, a strip approximately 25 miles long, and 1,154,251 linear feet of 9" wide basic intelligence film, or a strip 220 miles long.

2. From these photographs 5,425 separate photo-analytical reports have been prepared and disseminated to appropriately cleared officials.

3. Of the 8,602,700 square miles that comprise the USSR, the project has covered one or more times 1,300,000 square miles or 15% of the gross area.

4. The following table gives the aggregate coverage including repetitions:

	<u>Linear Miles</u>		<u>Square Miles</u>	
	<u>70 mm</u>	<u>9 inch</u>	<u>70 mm</u>	<u>9 inch</u>
USSR and Satellites (38 missions)	74,504	2,599,665	46,384	1,752,322
China and Tibet (13 missions)	30,058	1,097,931	16,561	1,061,292
Total (including non-Bloc, 239)	485,901	17,015,825	302,396	12,310,019

5. The Intelligence Community's summary Accomplishments of the U-2 Program which formed the basis for part of my testimony before Congressional Committees last May is attached to show the substantive contribution to our knowledge of the USSR made by the program.

(Signed)
ALLEN W. DULLES
Director

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ACCOMPLISHMENTS OF THE U-2 PROGRAM

I. Introduction

Five years ago, before the beginning of the U-2 program, the United States had organized against the threat of surprise attack by the Soviet Union every available measure in the classical intelligence bag of tricks. These efforts had given us considerable knowledge concerning the capabilities and intentions of the Soviet Union. But much of this was hard to verify and difficult to interpret. There remained many uncertainties concerning the types of military systems under development, the rate at which they were increasing their power, and their ultimate aims for its use.

This half-knowledge of the Soviet Union and uncertainty of its true power position posed tremendous problems for the United States. We were faced with the constant risk of exposing ourselves to enemy attack or of needlessly expending a great deal of money and effort on misdirected military preparations of our own.

To meet this situation, we determined to embark on the U-2 program to give the United States a firm foundation of hard information on which to make our intelligence judgments. The program has covered a large part of the most important areas in the Soviet Union and has provided information on a great variety of subjects important to our evaluation of the Soviet power position. Our main emphasis, however, has been directed against four critical problems, namely, the Soviet bomber force, the Soviet atomic energy program, the Soviet missile program, and the Soviet Air Defense System.

II. Intelligence of Soviet Offensive Capabilities
Against the U. S. and Its AlliesA. Manned Aircraft

The Soviet bomber force has been, and remains today, the main offensive striking force of the Soviet Union. For several years, the status of the Soviet bomber program was a controversial topic in U. S. intelligence.

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The U-2 program has confirmed that only a minimum long-range bomber production program is continuing in the Soviet Union. It has shown that some Soviet aircraft plants have probably been converted to the production of transport aircraft and that a few may possibly be engaged in some aspect of the missile program. It has also shown, however, that the Soviet Union has recently developed a new medium-range bomber with supersonic capabilities.

During the life of the U-2 program, we have covered numerous Soviet long-range bomber air fields. From this coverage, we have been able to confirm our estimate of the disposition of Soviet long-range bombers and have acquired data on the nuclear weapons storage facilities associated with them.

B. Ballistic Missiles

Ever since the first Soviet ICBM vehicle was launched in August 1957. Soviet propaganda has claimed that the world power balance was shifting in the direction of the Soviet Union. For several years, we have been aware that the Soviet Union was engaged in a high-priority ballistic missile development program. We have had and continue to have the ability to acquire data of actual Soviet ballistic missile flight tests.

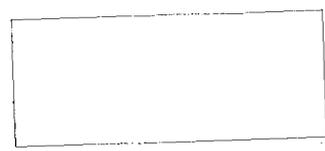
The U-2 program, however, has enabled us to look periodically at the actual ground facilities involved in the Soviet missile test program.

One of the most significant items of information acquired by the U-2 was revealed by our coverage of the Tyura Tam rangehead in the fall of 1957, immediately after the first Soviet ICBM firings. The significant fact was that the Soviets had only one launch facility at Tyura Tam.

The photography showed this facility to be a massive concrete structure sufficiently large to permit the launch of even larger vehicles than the relatively heavy Soviet ICBM and space vehicles.

The photography also showed that the Soviets were conducting all of their missile and space firings from a single launcher during the 1957-1959 period, clearly indicating a different concept from that used by the

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United States in the pre-launch checkout, erection, and firing of a missile. In fact, when these data were made available to U. S. missile experts, some of whom assisted us in our evaluation of the photography, they immediately embarked on a careful review of our own concepts for the use of launch pads.

This photography also provided us valuable insight into possible Soviet operational doctrine regarding ICBM deployment. It showed a reliance on rail as the major means of logistic support and operations. The rail line actually ran onto the launch pad.

From these data and related information on Soviet transportation systems, we are led to believe that the Soviet operational deployment of ICBMs will be directly associated with their rail system. By this, I mean that the missile and its supporting equipment would be carried on trains and moved from one pre-selected site to another, thus making it difficult for us to determine the precise location of any given missile unit on a continuing basis.

Even though the Soviet Union was able to sustain a considerable testing program from this one launch pad, photography of Tyura Tam during 1959 and 1960 has shown that a second and third launch complex were in varying stages of construction. The third launch complex is of a new type. It is too early to tell its intended purpose, but we have speculated that it may be used for a new type ICBM or that it may be the prototype of operational sites for troop training.

In summary, the photography collected by the U-2 has been a critical factor in our assessment that the Soviet ICBM program has not been and is not now a "crash" program; instead, it is an orderly, well-planned, high-priority program aimed at achieving an early ICBM operational capability.

In addition to our coverage of the ICBM test range at Tyura Tam, we have also had excellent coverage of the Kapustin Yar missile test range where Soviet intermediate and short-range missiles have been tested for the past 13 years. Over 600 ballistic missiles have been fired on this range in recent years.

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Our 1957 coverage of Kapustin Yar provided us our first information on the number and type of launch pads being used in this program. It also showed that the Soviets were dovetailing their development of operational equipment and troop training directly into their research and development program.

1959 coverage of the area showed that in two years the Soviets had doubled the number of launch pads and had available quarters for training about 6,000 troops in the operational use of these short- and intermediate-range ballistic missiles. It is apparent that the Soviet ballistic missile program is a dynamic and growing program.

In addition to our coverage of the two major ballistic missile test ranges, we have given top priority during the past year to the problem of detecting the construction of launching sites for operation ICBMs. The U-2 was by far our best system for collecting such information. We have covered a number of the most highly suspect areas in the Soviet Union without having found a single launch site for operational missiles. We were able to prove, however, that a number of sites reported to us by other sources did not actually exist.

We have had no opportunity to cover other large and highly suspect areas in the Soviet Union, and the mission of May 1 was routed to give us the maximum amount of coverage possible in these areas. In view of the Soviet boast about the shifting power position and our estimate that the Soviet Union could have a small number of missiles on launchers for use against the United States, we felt that it was essential that we provide the President with additional assurance of the true state of the Soviet ICBM program before he was to meet Khrushchev in negotiations. This was particularly important in view of the fact that the negotiations were the direct outgrowth of the Berlin crisis generated by the Soviet Union.

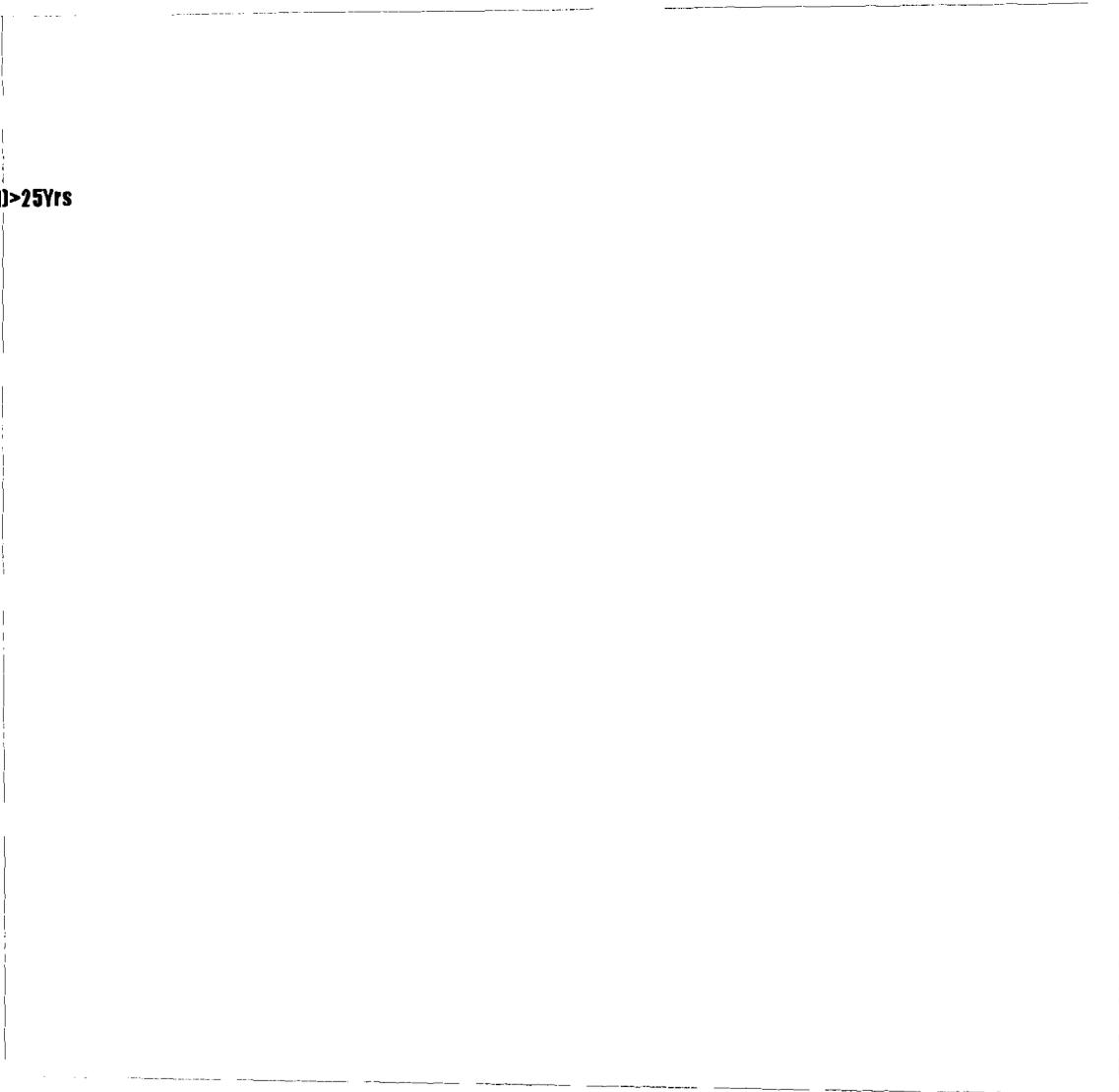
C. Atomic Energy

The U-2 program has provided a large body of valuable information on the Soviet atomic energy program. This information has covered the production of fissionable materials, weapons development and test activities, and the location, type, and size of stockpile sites.

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D. Other Soviet Capabilities

The U-2 program has given us important information on other aspects of Soviet capabilities:

Photography has shown that the Soviets have a modest but active chemical warfare program. It has also indicated that they may have a program of biological warfare testing.

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The program has provided us with a large amount of information on ground, naval, and air installations and order of battle. It has been particularly useful in confirming naval order of battle in the Murmansk and Black Sea areas.

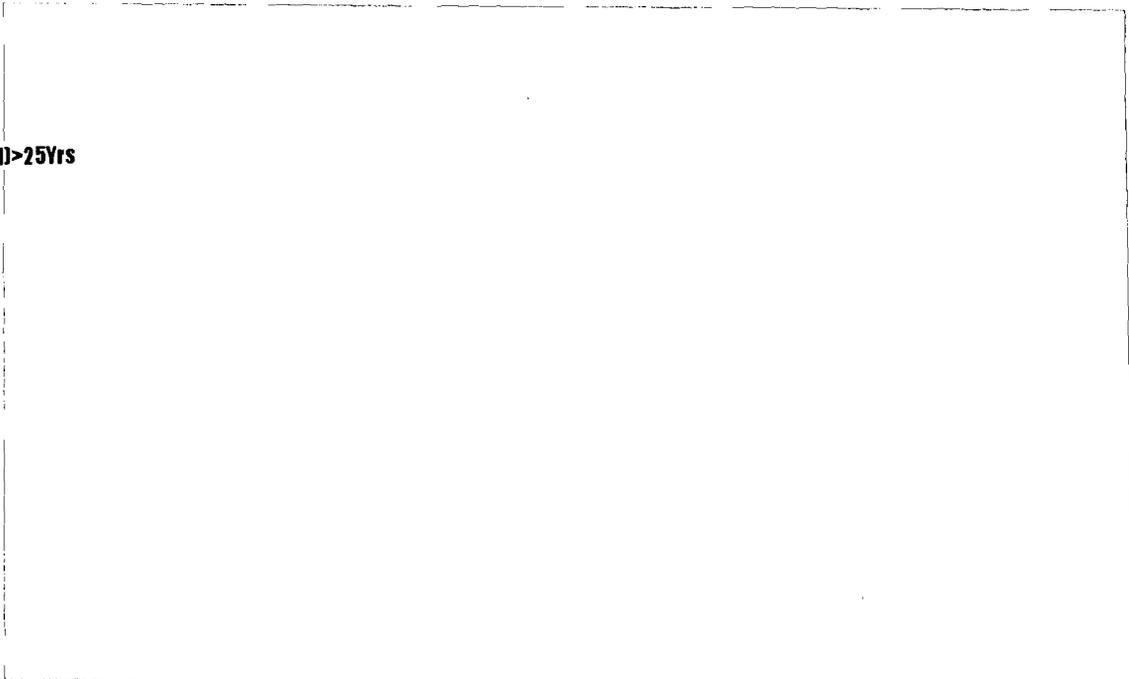
In general, the program has tended to confirm our estimates of the size, nature, and rate of growth of Soviet industry.

The material has also been used for the correction of military maps and aeronautical charts.

III. Intelligence Affecting the U. S. Deterrent Striking Force

A. Target Location, Definition, and Refinement

Prior to the inauguration of the U-2 program, much of U. S. target information was based on materials captured during and immediately after World War II. Much of this information was becoming obsolete.



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B. Electronic Defenses and Radar Order of Battle

On nearly all of the overflights of the Soviet Union the U-2 aircraft carried special electronic intercept and recording equipment. The purpose of this equipment was to determine the technical characteristics and locations of Soviet radars and other electronic devices associated with the Soviet air defense system.

The electronic intercepts recorded by the U-2 aircraft permitted us to establish the basic concept, magnitude, operational efficiency, deployment, and rate of development of the Soviet air defense system over the past four years. This in turn has provided operational information for the planning of flight routes by U.S. air strike forces.

Prior to the U-2 program, we had no way to determine that the Soviet Union was in the process of constructing a defense in depth covering the entire area of the Soviet Union with early warning and ground control intercept radars and their related weapons. If we based our estimates on a peripheral defense concept we would have arrived at a figure of about 400 early warning radars and associated equipment. On the basis of the information collected by the U-2, however, we now estimate that the Soviet Union has about 1600 prime radars with associated equipment.

This program has also allowed us to observe dynamic aspects of the Soviet air defense system by watching it in operation against the U-2. During the past four years we have observed the Soviet abandonment of prime heavy radars as height-measuring instruments and have seen the installation of special height-finding radars which give them a considerable improvement in their ground-controlled intercept capability.

We have seen the early deployment of new type radars in the interior of the Soviet Union before they began to be installed along Soviet borders. The U-2 has also permitted us to assess any difference between peripheral and interior defenses.

We have obtained technical information on airborne intercept radars and have observed the use of these radars in combat situations. Technical information also will assist the designers of U.S. electronics countermeasures equipment.

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C. Fighter Aircraft Defenses

The U-2 program has obtained photography on over a hundred fighter airfields. This has permitted us to determine the concept employed by the Soviets in their use of fighters as an air defense weapon. Moreover, the only information available to us on the latest Soviet Mach 2 fighters was obtained from one of the U-2 flights.

More important, however, the program has permitted us to observe these fighters in an active air defense capacity. We have photographs of various fighter types attempting to intercept the U-2 and have electronic intercepts of their air defense radars. We can also relate this information to our electronic intercepts of the early warning radars and get some idea of reaction time and efficiency of the Soviet fighter defense system.

D. Surface-to-Air Missile Defenses

Prior to the beginning of the U-2 program we knew that the Soviet Union had established a massive system of surface-to-air missiles in 56 sites located on two concentric circles around Moscow. We had some indication that they intended to employ a similar system around other major cities such as Leningrad but the evidence on this point was inconclusive.

The U-2 program not only permitted us to obtain fuller information on the Moscow SAM system, but it also proved conclusively that this system was not being installed around other cities.

In 1959, we discovered from both photograph and electronic intercept that a new and more flexible SAM system was being deployed around all major centers in the Soviet Union. We have photography on approximately 70 of the new sites and estimate that there are a total of 250 to 300 such sites in the USSR. We believe that this second generation missile is the missile known to the intelligence community as the "Guideline" missile with an estimated altitude capability of 60,000 feet extending up to 80,000 feet with a considerably reduced accuracy.

The data revealed by the U-2 program not only confirmed previous estimates that the Soviets were placing a very high priority on their air defense program but also provided positive evidence of the progress achieved.

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The information on the Soviet air defense system, particularly that concerning surface-to-air missiles, has had a direct bearing on the U.S. strike forces' planning. The discovery of the second generation SAM system caused them to greatly increase their emphasis on low level penetration tactics.

Preliminary analysis of the photography collected on one of our most recent flights indicates that the Soviets may be engaged in research concerning anti-ballistic missile radars and tracking. It is too early, however, to determine whether or not these developments include an actual anti-ballistic missile development program.

IV. Evidence of Basic Soviet Intentions

To the extent that Soviet military capabilities and trends in their development constitute evidence of Soviet intentions, the U-2 program has provided us with a great deal of important information.

As a result of the firm information that we have collected, it is our present judgment that the USSR is not engaged in a crash effort to develop an overwhelming nuclear delivery capability. As I mentioned earlier, the Soviet bomber program has been cut back to a minimum effort, and the ICBM development program appears to be an orderly, high-priority but not "crash" program.

We have seen that throughout the period the Soviet Union continued to give great priority to the development of a defensive capability in the form of surface-to-air missiles, fighters, and air defense radars.

By giving us better evidence concerning the Soviet development of specific weapons systems, the U-2 program has enabled the U.S. to tailor its own defenses more precisely to the actual Soviet threat.

The program has also given us increased confidence in our judgments concerning the issue of peace or war in crisis situations. Whenever the international situation becomes tense because of a problem in some particular area, we are concerned whether the situation might get beyond control--that someone on the other side might suddenly and irrationally unleash big war.

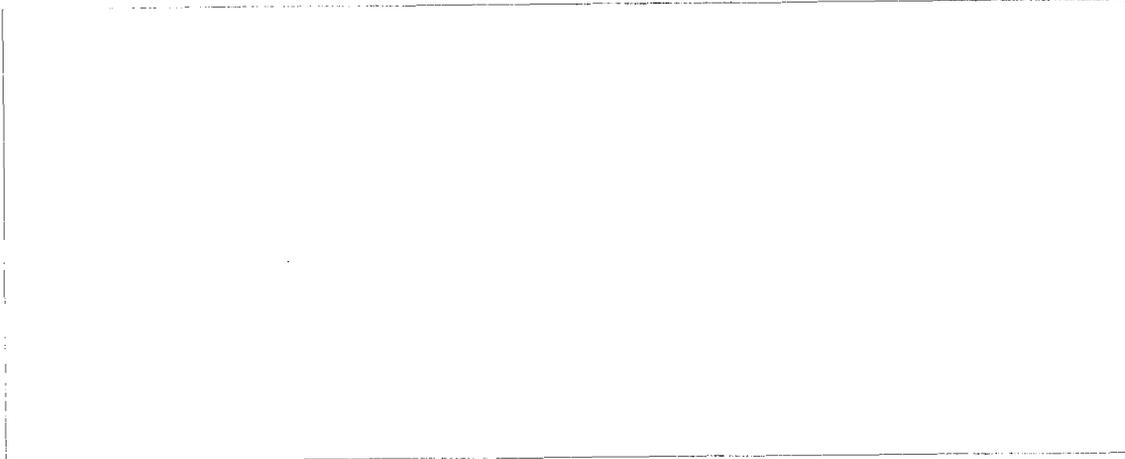
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It is extremely difficult for me to sum up in words the significance of this effort to our national security. I do not wish to exaggerate, nor do I wish to belittle other vital intelligence programs. This photographic coverage and the data derived from it are an inseparable part of the whole national intelligence effort. But in terms of reliability, of precision, of access to otherwise inaccessible installations, its contribution has been unique. And in the opinion of the military, of the scientists and of the senior officials responsible for our national security it has been, to put it simply, invaluable.

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