

A "Hot" Front in the Cold War

## The U-2 Program: A Russian Officer Remembers

Alexander Orlov

*Editor's Note: The following article was excerpted from a longer study written by a retired Soviet Colonel who spent most of his 46-year military career with the former USSR's Air Defense Forces. Col. Alexander Orlov personally participated in many of the events described below. The narrative and the views expressed herein reflect his own recollections and analyses of Soviet responses to the US U-2 program during 1956-1960, the period when U-2 aircraft were overflying the USSR. Unfootnoted facts and quotes in this article come largely from the Colonel's memory. Col. Orlov's statements of fact and analysis do not necessarily reflect the official views of any government, past or present, including those of Russia and the former Soviet Union as well as the government of the United States.*

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### The U-2: Response to Soviet Arms Buildup

The first U-2 overflights of the Soviet Union—launched from Wiesbaden Air Base in what was then West Germany—took place on 4 July 1956. The rapid development and deployment of this light, high-altitude photoreconnaissance aircraft had been spurred by American alarm over the USSR's accelerating efforts to catch up with and surpass the West in the post-World War II arms race. US leaders saw the U-2 as a relatively low-risk means of ascertaining what kinds of strategic weapons systems had priority in the Soviet buildup, how far these efforts had progressed, and where Soviet airbases and missile posi-



Russian Col. (retired) Alexander Orlov, at CIA/CSI public symposium on U-2 program, Washington, 17 September 1998.

tions were located. The U-2 could fly at an unprecedented altitude of about 21.5 kilometers (around 71,000 feet), which exceeded the reach of Soviet interceptor aircraft.

### Other Possible Factors in Timing of First U-2 Flights

**1956 Moscow Air Show:** Some observers thought that more immediate events in Moscow had an impact on US decisions about the timing of the first U-2 flights. The Soviet government, concerned about violations of its airspace in border areas by US reconnaissance aircraft, decided to show foreigners that the USSR had weaponry capable of combating such intruders. Some 28 foreign air force delegations were invited to a Soviet air show on 24 June 1956; the US team was headed by the Air Force's

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### The Former Soviet Union



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Chief of Staff, General Nathan Twining. The event took place at Tushino airfield in the Moscow area. Seven new jet fighter models were displayed. The demonstration flights sparked animated, positive comments from the guests, who lauded the fighter planes' performance characteristics and the skills of the Soviet pilots.

**Khrushchev's Bluster:** Following the air show and a reception hosted by Soviet Defense Minister Marshal G. K. Zhukov, the Soviet Politburo members who attended the reception, led by party chairman Nikita Khrushchev, took the leaders of the US, British, and French delegations to a park and sat them down at a picnic table. Khrushchev then launched into a protracted toast "in defense of peace." In the midst of his toast, he turned to General Twining and said, "Today we showed you our aircraft. But would you like to have a look at our missiles?" "Yes," the General responded. "Well, we will not show them to you," replied Khrushchev. "First show us your aircraft and stop sending intruders into our airspace. We will shoot down uninvited guests. We will get all of your Canberras [RB-57 long-range reconnaissance aircraft]. They are flying coffins."

At that moment, Khrushchev noticed that a US military attache was pouring the contents of his glass under a bush. Turning to US Ambassador Charles Bohlen, the Soviet leader said, "Here I am speaking about peace and friendship, but what does your military attache do?" The attache was then pressured into demonstratively drinking an enormous "penalty" toast to Soviet-American friendship, after which he quickly departed.

Ambassador Bohlen and General Twining clearly were agitated about Khrushchev's abrupt shift in tone. The incident was smoothed over by Russian hospitality during a subsequent trip through the countryside, and when General Twining and other senior US Air Force officers departed from the Soviet Union on 1 July, they were given a warm and friendly send-off by the Commander-in-Chief of the Air Force and Chief Marshal of Aviation, P.F. Zhigarev, and other ranking Soviet military leaders.

The two sides thus parted on a friendly note. But systematic Western violations of Soviet airspace resumed almost immediately. These intrusions appeared to some observers to be at least partly in response to the demonstrations of the new jet fighters at the air show and Khrushchev's boastful and threatening behavior. In fact, however, these events in Moscow and Washington's decision to begin U-2 missions shortly thereafter were coincidental: *Before* General Twining went to Moscow for the show, President Eisenhower had already authorized U-2 reconnaissance flights over the USSR during a ten-day period starting in early July.

#### **Early U-2 Flights . . .**

During the ten days beginning on 4 July 1956, the U-2 detachment from Wiesbaden made five deep incursions into Soviet airspace at an

altitude of approximately 20 kilometers (about 66,000 feet). The U-2s obtained high-quality photography of such targets as airfields near Moscow where bombers were based and a shipyard near Leningrad (now St. Petersburg) where submarines were being built. Soviet radar detected and tracked the U-2s (albeit with some gaps in coverage). Moscow repeatedly protested the incursions to the US Embassy.

#### **. . . Reveal Much About Soviet Weaponry**

Over the next several years, photography obtained from U-2 missions uncovered some key elements of the Soviet air defense system, including fighter-interceptor airfields, surface-to-air missile (SAM) positions, radar sites, and locations of aircraft production facilities. Photographs from U-2 flights also showed that Soviet capabilities for producing strategic bombers were quite modest by US standards, and that no significant program existed for building such bombers. On the other hand, U-2 photography revealed widespread construction of nuclear-powered submarines capable of carrying ballistic missiles.

**Missiles and Satellites:** The early U-2 flights provided the US Government with considerable information on Soviet strategic missiles. U-2 photography established that intermediate-range missiles intended chiefly for operations in the European theater were being tested at the Kapustin Yar missile range. U-2 missions also located a test site for intercontinental missiles in the Tyuratam area and uncovered many important details about testing there. In addition, U-2s discovered equipment at Tyuratam for launching

satellites. In terms of the scope of its work, Tyuratam was comparable with the US test site at Cape Canaveral.

Events soon began to confirm the reliability of U-2 intelligence. In the latter half of 1957, the Soviets successfully tested an intercontinental missile and launched the USSR's first earth satellites at Tyuratam. Combining this information with what was known at the time about testing of nuclear weapons on Novaya Zemlya, US authorities concluded that the USSR was overtaking the United States in the area of nuclear-capable missiles.

As Soviet military spending rose in the late 1950s, production of missile weapons continued to expand. The US Defense Department calculated that by the mid-1960s the USSR would be capable of putting as many as 500 ICBMs on alert—enough, US military officials thought, to destroy many US Strategic Air Command aircraft and missiles as well as the principal US cities in a surprise attack.

U-2 photography in the late 1950s also showed work under way in the USSR to create and produce SAM systems. U-2 missions discovered an air defense test site at Saryshaghan, and US authorities concluded that successful missile test launches were being conducted there.

**Shortcomings:** All these developments alarmed the White House and the Pentagon, and the American press dwelt on the notion that the US was lagging behind the USSR in missile programs. But by early 1960, U-2 missions had helped establish that actual deployment of missiles in the USSR was proceeding at a very slow

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pace. U-2 photography also showed that most combat positions for Soviet missiles were located along the Trans-Siberian Railroad; US experts concluded that the early Soviet ICBMs were so heavy and cumbersome that they could be moved only by rail. U-2s also collected intelligence indicating another major shortcoming of first-generation Soviet ICBMs: the liquid propellant they used was extremely unstable and had to be changed frequently, making it impossible to maintain the missiles in constant combat readiness.

### **Soviet Reactions to U-2 Overflights**

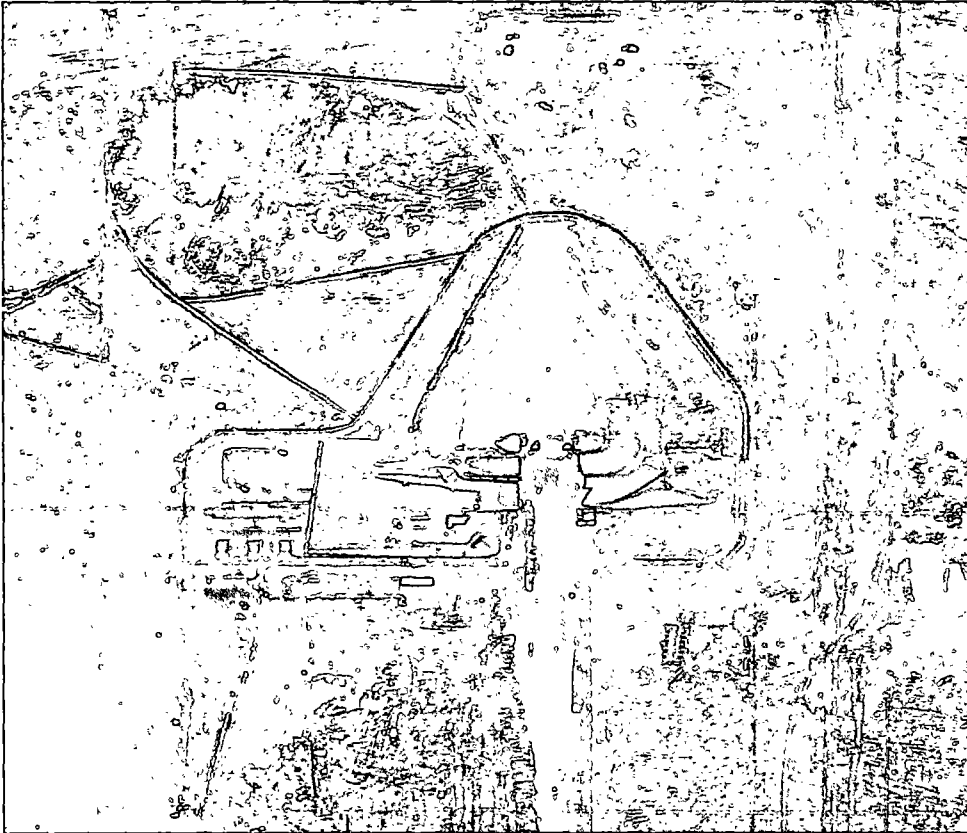
Soviet military intelligence was fully aware of U-2 high-altitude reconnaissance flights from their very beginning. Soviet radar tracked the first two U-2 flights as they proceeded from West Germany through Eastern Europe and over the USSR on 4 and 5 July 1956. The first flight spent more than 2 1/2 hours over Soviet territory; the second was in Soviet airspace for almost 3 1/2 hours, penetrating to a depth of 1,000 kilometers (about 620 miles).

The Soviets observed three more deep U-2 incursions into their airspace on 9-10 July, tracking them as they proceeded from West Germany at altitudes of 16 to 20 kilometers (about 52,000 to 66,000 feet). These aircraft spent from three to

4 1/2 hours over Soviet territory, penetrating to depths of 700 to 1,400 kilometers (about 435 to 870 miles). Soviet and other Warsaw Pact radar observed each of these flights over the entire extent of their routes (with some gaps), and air defense fighter aircraft were vectored to the targets, but the fighters' ceilings were below U-2 altitudes by several kilometers, preventing them from operating effectively against the reconnaissance planes.

The Soviets also took steps through diplomatic channels. An official protest note to the US Government on 10 July stated that American violations of Soviet airspace represented “a deliberate action by certain US circles designed to exacerbate relations between the Soviet Union and the United States.” Like Soviet notes of previous years protesting intrusions by US military aircraft into Soviet airspace, the 10 July communication maintained that such actions were violations of international law.

A pause ensued in U-2 overflights of the USSR after those of July 1956, but they were resumed in 1957, creating new complications for the Soviets. President Eisenhower, citing the dangerous tenseness of the world situation in autumn 1956 in light of the Anglo-French-Israeli invasion of Egypt and the Hungarian uprising, did not allow more flights over the USSR until early 1957. Between March and October of that year, Soviet air defense radar picked up five U-2 overflights. In contrast to the July 1956 flights, the U-2s in 1957 reconnoitered areas of the Transcaucasus, Kazakhstan, and elsewhere in Central Asia, Siberia, and the Soviet north. Flying at altitudes of 19 to 21 kilometers (about 62,000 to 69,000 feet), they were beyond the reach of



U-2 photograph of Tyuratam Missile Testing Range

the Soviet Air Defense Forces' fighter planes and anti-aircraft artillery.

### Some Soviet Successes

Nineteen fifty-seven also was the year of the USSR's breakthrough in outer space, and Soviet successes were accompanied by a noisy propaganda campaign on the part of the Khrushchev regime. Khrushchev declared publicly that the USSR "was making missiles like sausages." Soviet influence on Third World nations also was on the rise in the late 1950s, as were rates of economic development in many Communist-ruled countries. All this was received painfully by American public opinion.

In response, the US Government further intensified its efforts to penetrate

the Iron Curtain in search of reliable information. Soviet programs for developing advanced weapons were of particular concern in US military and intelligence circles. The Soviets were deploying strategic missiles, building nuclear-powered submarines, adding new surface-to-air missiles to their inventory, and equipping the Air Defense Forces with advanced radar and other equipment.

Nonetheless, the Soviets still did not appear to have weapons capable of combating high-altitude aircraft, notably the U-2. This meant U-2 flights were among the most important sources of information on the USSR's arms programs. Even so, CIA leaders recognized that the constant upgrading of Soviet air defenses was making deep U-2 penetrations increasingly risky. Reports from US agents in the

USSR that Soviet intelligence was gathering more and more information about the U-2 flights were having an impact in Washington. Richard Helms, at that time a senior manager of CIA's Plans Directorate and of high-altitude reconnaissance operations against the USSR, recalled later that when the CIA learned from Pyotr Popov, one of its prize moles in Soviet military intelligence, that the Russians had amassed much information about the U-2, "it brought me right out of my seat."<sup>1</sup>

As U-2 operations continued in the late 1950s, photography from these missions revealed that more and more Soviet Air Force and Air Defense units were receiving new combat and electronic equipment. For example, P-30 (probably the FAN SONG series)<sup>2</sup> radar systems that could detect

aircraft at altitudes above 20 kilometers (about 66,000 feet) began to enter service with Air Defense units during this period. In addition, Soviet air regiments in 1959 received T-3 (probably SU-9 FISHPOT) high-altitude interceptor aircraft with a supersonic speed and an altitude ceiling also above 20 kilometers. And SAM units around that time started receiving the highly regarded S-75—almost certainly the SA-2 GUIDELINE missile system, which had a 25-kilometer (approximately 82,000 feet) engagement altitude against targets flying at up to 1,500 kilometers (about 930 miles) per hour.

### 1960: “Air War” Heats Up

In early 1960 the Soviet Government announced that the USSR had established a new branch of the military—the Strategic Missile Forces. This development raised some new questions for high-altitude reconnaissance operations by US intelligence. Where were the USSR’s strategic missiles being deployed? What models had been placed in service? What were their combat capabilities and numbers? And—to what extent were Soviet air defenses capable of opposing modern US strategic aviation? These questions had to be answered by new U-2 incursions into Soviet airspace.

Those encroachments soon materialized. On 9 April 1960, Soviet radar in the Turkestan Military District acquired an airborne target in Soviet Central Asian airspace. Proceeding at an altitude of 19 to 21 kilometers (approximately 62,000 to 69,000 feet), the target—a U-2—flew several legs over the Semipalatinsk nuclear test site. It then flew over or near the SAM forces at Saryshaghan, and from

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there proceeded to the Tyuratam strategic missile testing range and over the city of Mary, from which it departed into Iran. The entire overflight lasted more than six hours.

Following this incident, the Soviet leadership appointed a commission that included the author of this article—who at that time was serving on the Main Staff of the Air Defense Forces—to investigate the reasons for the failure of the Air and Air Defense forces to move successfully against the aircraft that had violated Soviet airspace for so many hours. The investigation uncovered serious shortcomings in air combat training and in command and control of Air Defense and Air Force personnel and weapons systems. Many omissions were discovered in the operation of advanced radio equipment. In particular, information related to this reconnaissance activity had been acquired by Soviet communications interception facilities in the Transcaucasus several days before it happened, but the information was not reported to the command element because of a number of chance happenings.

Khrushchev was indignant. Reality had undercut his repeated statements about the high degree of Soviet combat readiness. Many generals and other officers were penalized. Positive action also was taken: the Air

Defense Forces Main Staff charted out anticipated routes of future U-2 flights. The author of this article participated in that undertaking.

### Shootdown of a U-2: The Francis Gary Powers Episode

The conclusions that the Soviets drew from the 9 April failure led to a dramatic success on 1 May. Hours before the beginning of the annual May Day parade in 1960, Soviet Air Defense forces detected a high-altitude target flying over the Tajik SSR in Central Asia. Its altitude was more than 19 kilometers (around 62,000 feet). It was a U-2, piloted by Francis Gary Powers.

An alert signal summoning staff officers to their command posts was telephoned to the officers immediately. As members of the command element of the Air Defense Forces arrived and went to their workstations, an uncomfortable situation was shaping up. The May Day parade was scheduled to get underway at mid-morning, and leaders of the party, the government, and the Armed Forces were to be present as usual. In other words, at a time when a major parade aimed at demonstrating Soviet military prowess was about to begin, a not-yet-identified foreign aircraft was flying over the heart of the country and Soviet air defenses appeared unable to shoot it down.

The aircraft thus was tracked from the ground in a tense atmosphere. Nerves of military people at airfields, missile positions, command-and-control facilities, the Air Force, and the Air Defense Forces were badly frayed. Marshal S. S. Biryuzov, Commander-in-Chief of the Air Defense

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Forces, was the target of irate phone calls from Khrushchev and other Kremlin leaders. The tone of these calls was approximately as follows: “Shame! The country was giving air defense everything it needs, and still you cannot shoot down a subsonic aircraft.” Biryuzov responded emotionally, “If I could become a missile, I myself would fly and down this damned intruder.”

As often happens at critical moments, unanticipated circumstances interfered with shooting the aircraft down during the Central Asian leg of its overflight of the USSR. A missile battalion whose zone was overflowed by the U-2 was not on alert duty that day. The U-2’s route was such that a successful missile launch against it did not appear feasible at first. Fighter aircraft were unable to get to the right positions for shootdown attempts. And the U-2 maintained radio silence. (In fact, it had no long-range radio system.)

Khrushchev demanded that the intruding aircraft be shot down at all costs. The Soviet leader and his lieutenants clearly viewed the violation of their nation’s skies by a foreign reconnaissance aircraft on the day of a Soviet national holiday, and just two weeks before a summit conference in Paris, as a political provocation.

Powers and his U-2, meanwhile, were heading confidently northward. A Soviet SU-9 FISHPOT high-altitude fighter aircraft, which was in the area on an unrelated mission, took off from an airfield at Sverdlovsk (now Ekaterinburg) to try to intercept the U-2. The pilot of this aircraft, which was not appropriately armed or equipped for such a mission, was directed to close with and ram the intruder. The risk was enormous and

the chances for success were negligible. The pilot managed briefly to gain the necessary altitude, but he did not catch sight of the target, and the attempt was abandoned.

The U-2 then entered the engagement zone of a SAM battalion near Sverdlovsk. The unit’s officer in charge issued the order: “Destroy target.” At 0853 hours, the battalion’s first missile exploded behind the U-2, and its fragments pierced the tail section and the wings without touching the cockpit. Those of us who were at the command post in Moscow remember reports about the missile firing and a statement that the target “began to blink,” either in employing jamming or in breaking up. The latter, it turned out, was the case.

Powers, realizing that he had lost control over the aircraft and had to abandon ship, jettisoned the canopy and crawled from the cockpit with difficulty. He was unable to eject because the explosion had shoved his seat forward and his legs were caught beneath the instrument panel. After he abandoned the aircraft and was parachuting to the ground, the U-2 was hit directly by another missile. The fuselage, engine, wings, and cockpit ended up scattered on the ground over an area of several square kilometers.

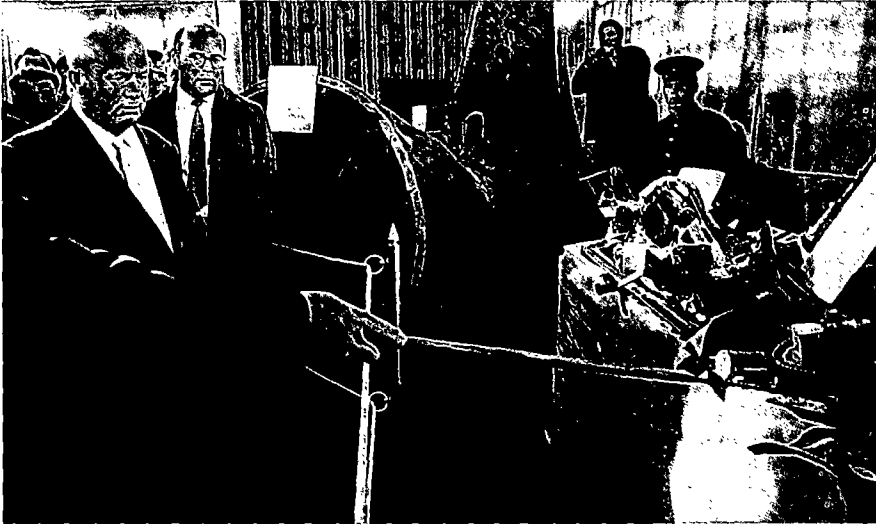
At first, no one on the ground in Sverdlovsk and Moscow realized that the intruding U-2 had been downed. A target blip reappeared on radar and was immediately hit by a missile from another SAM battalion. But this “target” turned out to be a Soviet fighter jet that had been scrambled to intercept the U-2. The monitor screens then cleared up, and it became clear that the U-2 had been shot down. Marshal Biryuzov phoned the news to Khrushchev, who voiced doubts. Biryuzov immediately ordered a team of officers to fly to Sverdlovsk and get the details. The Marshal then headed for the May Day parade.

Within a few hours, an investigative team flew from Moscow to Sverdlovsk. It included people from the Central Committee apparatus, military counterintelligence, the KGB, the General Staff, and the Air Defense Forces. The investigators began looking for aircraft parts and other items strewn across fields and groves. They found large, wide rolls of exposed film, much of which was developed later almost without losses, enabling the Soviets to see what targets had been photographed and with what quality.

Francis Gary Powers survived the shootdown and was taken to Moscow. During the first several days in May, the Soviets did not acknowledge that he was alive and in their hands.

### **Soviet and US Maneuvering Over Downed Pilot**

The investigative commission compiled a report on the U-2’s performance characteristics, equipment, and missions accomplished. Based on recovered parts and



Soviet leader Khrushchev and wreckage from shootdown of U-2 piloted by Francis Gary Powers

equipment, the investigators quickly ascertained some key details about the U-2 camera system and its capabilities.

Washington, meanwhile, issued a cover story on 3 May to the effect that the US Government had been using U-2s in a program for studying meteorological conditions in the upper layers of the atmosphere, and that one such aircraft had disappeared while in Turkish airspace on 1 May. This “report” said the aircraft may have crashed in Lake Van (in eastern Turkey) after the pilot had reported an oxygen equipment malfunction.

At a Supreme Soviet session on 5 May, Khrushchev made public some of the details of the U-2 incident, but he did not reveal that the pilot was alive and that recovered aircraft parts and equipment were already starting to allow conclusions to be drawn about the nature of U-2 missions over the USSR. On the same day, US authorities made further attempts to camouflage Powers’ mission. State Department and NASA spokesmen made statements

reiterating and embellishing the story issued on 3 May.

At a diplomatic reception on the evening of 5 May, the US Ambassador to the USSR, Llewellyn Thompson, overheard Soviet Deputy Foreign Minister Yakov Malik tell the Swedish ambassador that “we are still questioning the pilot” of the downed U-2. Two days later Khrushchev announced that the pilot was alive and in the USSR; US government agencies then admitted that the aircraft had deliberately flown into Soviet air space. President Eisenhower confirmed at a press conference on 11 May that US reconnaissance flights over the USSR were part of the American effort to collect information on the Soviet Union and had been occurring regularly for a number of years. Eisenhower declared that he had “issued orders to use any possible methods to collect information necessary for defending the United States and the free world against surprise attack and to give them an opportunity to prepare effectively for defense.”<sup>3</sup> He added that spy meth-

ods were necessary because “secrecy and secrets had become a fetish in the Soviet Union.”<sup>4</sup>

The U-2 shootdown incident had important consequences. US-Soviet relations worsened. The US halted its manned reconnaissance flights over the USSR; it soon began using Midas and Samos reconnaissance satellites instead. A summit conference slated for mid-May in Paris did not take place, and a visit by Eisenhower to the USSR, planned for 10 June 1960, was canceled.

Thus ended the first phase of US attempts to “open the sky” over the USSR and penetrate the secrets of Soviet weapons programs as the arms race accelerated.

### **Fate of the Pilot—and of U-2 Overflights of the USSR**

In August 1960, Powers was subjected to a three-day open trial in Moscow. He was sentenced to 10 years by the USSR Supreme Court’s Military Cases Collegium. Powers was exchanged in February 1962, however, for Soviet intelligence officer Rudolph Abel, who had been arrested in the United States.<sup>5</sup>

Although the US had ended reconnaissance flights deep into Soviet airspace, U-2s continued flying missions close to Soviet territory that were designed to reconnoiter Soviet military sites without actually violating the USSR’s borders. Some violations nonetheless occurred. During 1962, for example, one U-2 overflew Sakhalin Island and another violated the Soviet border in the far north. In both instances, the Kremlin sent protest notes and the US apologized.





Trial of Francis Gary Powers

### The U-2 and the Cuban Missile Crisis

Following the US-inspired armed invasion of Cuba by emigres in April 1961, Washington's imposition of an economic blockade on Cuba, and other US actions widely seen as threats to the Castro regime, Havana turned to the USSR for help in laying down a protective "screen" against possible US intervention. Khrushchev, supported by Defense Minister Malinovskiy, called for stationing Soviet intermediate-range missiles on the island. This was a response not only to the perceived US threat to Cuba, but also to the stationing of intermediate-range missiles in Europe (in Britain, Italy, and Turkey).

To "equalize" the threat to the USSR posed by the US missiles in Europe, Moscow decided to install R-12 (SS-5) intermediate-range missiles in

Cuba that were capable of hitting targets in the United States at a distance of up to 2,000 kilometers (1,250 miles). The Soviets also began preparing an operation to send troops and Air Force and Air Defense units. A total of 40,000 Soviet officers and men and 42 R-12 missiles—plus 20 nuclear warheads for the missiles—were ultimately stationed on the island. Not surprisingly, the Soviets also implemented *maskirovka* (camouflage concealment) measures, but the deployment of combat equipment and troop contingents on such a large scale proved impossible to conceal.

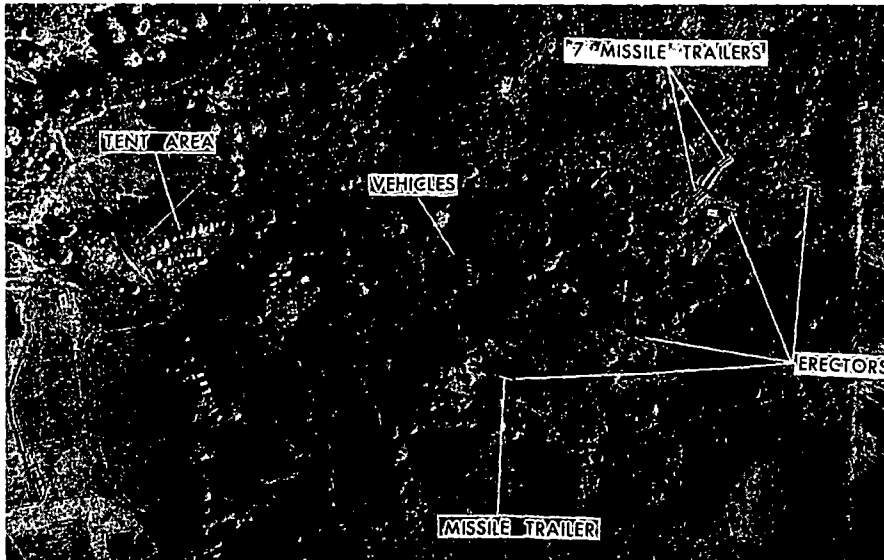
The United States, in response, activated monitoring and intelligence collection systems. Prominent among these were U-2 reconnaissance aircraft, which began taking aerial photography of Cuban territory.

On 22 October 1962, President Kennedy announced the establishment of a naval blockade or "quarantine" of Cuba. The US sent 183 naval ships into the Caribbean. Ship commanders received instructions to search cargo vessels headed for the island—a violation of the rules of international law. Soviet vessels, meanwhile, were proceeding to Cuba as well. The US warships stood in their path. Tensions heightened. A common understanding existed on both sides that something irreparable could happen at any time.

The crisis reached its apogee on 27 October when the Soviets shot down a U-2 piloted by Major Rudolph Anderson while he was photographing missile positions in Cuba. (Major Anderson was fatally injured.) According to a Soviet Major General who worked for the commander of Soviet forces on the island, the decision to destroy the aircraft was made by Lieutenant General S. Grechko, who was at an Air Defense command post in Cuba. Grechko had first tried—unsuccessfully—to reach his superiors by phone, presumably to consult with them before taking action against the U-2.

Shortly after Major Anderson's U-2 was downed, a message came from Moscow to its forces in Cuba, consisting of two sentences: "You were hasty. Ways of settlement have been outlined . . ." <sup>6</sup> In fact, the risk of escalation had been enormous. Soon after the shootdown, for example, the Defense Department proposed that the US immediately mount a strike against Cuba. President Kennedy rebuffed the proposal.

During the crisis I was ever-present at the central command post for Soviet Air Defense Forces. I vividly



U-2 photography of Soviet MRBM site in Cuba; October 1962

remember this extremely tense time. The entire Main Staff combat team was at combat readiness. Reports from the field, including those from the air defense units in Cuba, grew more alarming each day. Immediately after President Kennedy's announcement on 22 October, the number of US strategic bombers on airborne alert began to grow menacingly. Intelligence of all kinds was being produced and used with maximum intensity. Then, on the night of 27-28 October, President Kennedy's proposal for a withdrawal of Soviet missiles from Cuba in exchange for a guarantee of US non-intervention in the island's internal affairs was discussed, and a settlement was soon announced by Kennedy and Khrushchev, bringing sighs of relief on both sides.

### Aftermath

In those nerve-wracking days, when it seemed that a military conflict was about to break out, both sides had

enough courage and wisdom to begin intensive diplomatic discussions and make mutual concessions. After the Cuban missile crisis, the tensions of the global secret "air war", in which the U-2 had played a central role, began to abate. IncurSIONS into Soviet airspace by reconnaissance aircraft became less necessary with the emergence of US satellites, although US reconnaissance flights along the USSR's borders continued—and occasionally violated Soviet airspace.

Nuclear missiles gradually supplanted air power as the chief arena of superpower competition. Broadly speaking, mutual suspicion between East and West remained deep for many more years—until the Gorbachev era of the mid-to-late 1980s and the subsequent collapse of the Soviet Communist Party and breakup of the USSR. Until then, the arms race was vigorously pursued by both superpowers. In the 1950s and 1960s—that is, at the height of the Cold War—conditions had not

yet formed for a broad and constructive dialogue, for slowing the arms race, for exchanging military secrets, and for reducing reliance on force as a primary component in international relations. It took decades of bitter experience in confrontation before all this could begin to change.

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### Notes

1. Beschloss, Michael R., *May Day: Eisenhower, Khrushchev, and the U-2 Affair*. New York: Harper and Row, 1986, p.236
2. In the mid-to-late 1950s the Soviets deployed a variety of radar systems capable of detecting aircraft at long-range distances and high altitudes. The radar deployed with the SA-2 Guideline surface-to-air missile (which was used to shoot down Francis Gary Powers' U-2) was known as the FAN SONG.
3. Beschloss, op.cit., pp.52-54
4. Quoted from "Aggressorov k pozornomu stolbu," ("Aggressors to the Pillory"), Moscow, 1960, pp. 109-110.
5. Powers was killed on 1 August 1977, at the age of 47, in the crash of a helicopter he was flying for a Los Angeles television station. He was buried with honors in Arlington National Cemetery. A decade later the US Air Force awarded him posthumously the Distinguished Flying Cross.
6. "Krasnaya Zvezda," 4 February 1990