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**Maybe You Had to Be There:**  
**The SIGINT on Thirteen Soviet Shootdowns**  
**of U.S. Reconnaissance Aircraft ~~(S-CCO)~~**

MICHAEL L. PETERSON

(U) When Robert Gates, the Director of Central Intelligence during the last year of the Bush administration, was trying to convey the significance of the change in the nation's security concerns following the end of the cold war, he declared to a congressional committee sometime in late 1992 that he was presently far more concerned with being *acquired* than being *invaded*.

(U) Although his objective was to emphasize change, Gates touched on America's major cold war fear of being *invaded*, a word that implied that the nation would first be subjected to attack with atomic bombs dropped from Soviet intercontinental bombers, cruise missiles fired from Soviet submarines, and multiple independently retargetable thermonuclear warheads released from Soviet ICBMs. This fear of sudden Soviet attack fueled, among other things, the U.S. military's program of aerial reconnaissance against the Soviet Union.

(U) Maybe you had to be there in the late 1940s and early 1950s to appreciate the degree of the nation's concern over the threat posed by the Soviet Union after World War II. Maybe you had to be around also to appreciate the enormous gap in our knowledge of Soviet military and industrial capabilities hidden behind the Iron Curtain.

~~(S)~~ Today it's different. Today there is less concern along these lines, and there is certainly no information gap of comparable significance. Today if you look at an intelligence map of the former Soviet Union, you probably couldn't see the geographical features for all the annotations. Covering the depictions of winding rivers, modest mountain ranges, great deserts, and miles and miles of tundra would be circles and squares and diamonds, and arrows pointing to boxes of information everywhere.

~~(S)~~ Every fighter base would be located, along with the airfield's runway orientation and listings of the number and specific type of aircraft and its weapon systems; even the airfield radar facilities would be identified. Virtually every fixed air defense radar and surface-to-air missile (SAM) site would be pinpointed, especially along the nation's borders, and its capabilities would be known.

~~(S)~~ The same would go for every strategic bomber base; every Army barracks complex and its tank and artillery park; fixed ICBM launch sites; and naval bases with their complement of warships. Moreover, the specific locations of each civilian and military wartime command bunker would be highlighted, with red lines showing the

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communication links, including buried HF antenna fields, VHF and UHF antennas, landline terminuses, microwave towers and satellite dishes used for commanding the forces. On this map, *every* major factory and industrial complex would be listed, along with what was manufactured and at what annual rate. *Every* nuclear power plant would be identified. The oil and gas bearing regions would be shaded. The gold mines and other mineral sites would be marked.

(U) That annotated intelligence map didn't just happen. The information took years to acquire and validate. Such a wealth of information may be taken for granted today, but it was not forty years ago.

(U) A writer on national security matters provides a dramatic summary of the situation then:

During the five years immediately following the end of World War II, American exhilaration at vanquishing a heavily armed and tenacious foe turned in rapidly successive stages from consternation to apprehension to outright alarm as yet another threat began to materialize from the rubble of the conflict that had barely ended: Stalinist Russia...<sup>1</sup>

(U) In 1945, the Soviet Union might as well have been on Mars. The United States knew little about this vast state that stretched 5,000 miles east to west and 2,000 miles north to south, spanning two continents and almost half of the world's twenty-four time zones. Except for small areas immediately around Moscow, Leningrad, Vladivostok and maybe Murmansk, where U.S. and Allied personnel had visited or had been stationed in World War II, the military and economic landscape of the Soviet Union was mostly a mystery.

~~(S)~~ Now, with the identity of the threat known, and the abysmal lack of knowledge about the threat established, the next question was, What to do about it? The answer was, of course, to begin to collect intelligence in a serious way. Human intelligence (HUMINT), imagery intelligence (IMINT), and our favorite "int," SIGINT, combined to turn a blank sheet of paper that was an intelligence map of the Soviet Union in 1945 to probably the most annotated target map in the world by the late 1980s.

~~(S)~~ Clearly, many sources of intelligence contributed to marking up that target map, and one of the most important was airborne reconnaissance, both photographic and electronic, mostly by the U.S. Air Force and Navy, with help from the CIA.

(U) In the field of photoreconnaissance, for example, U-2 overflights of the Soviet Union during the late 1950s settled the "bomber-gap" controversy that had grown up in the early years of the decade when faulty intelligence led many to believe that the Soviets were far ahead of the United States in the development and production of intercontinental bombers. Said one author who personally participated in the exploitation of U-2 photography beginning in 1956:

Subsequent U-2 missions crisscrossed long-range bomber bases in the western areas of the Soviet Union. These missions were generating accurate, current information in greater quantities than had ever been contemplated . . . . Analysts began reevaluating assumptions regarding Soviet

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strategic capabilities. Within a few weeks, analysis of the U-2 photography had dispelled the bomber-gap myth.<sup>2</sup>

~~(S-CCO)~~ SIGINT reconnaissance, too, proved to be of considerable intelligence value early in the program. In 1957, during the first six months of the airborne COMINT reconnaissance program (ACRP) in Europe, for example, the fleet of two USAF RB-50s flew ninety-seven intercept missions, producing 1,535 hours of actual intercept, much of it unique, and accounting for several "first hears," including Soviet line-of-sight VHF communications beyond the intercept range of fixed field sites.<sup>3</sup> This intercept immediately began to be translated into baseline intelligence, particularly order-of-battle information. In 1958, the Director of Intelligence for the USAF stopped all ACRP flights and requested a detailed evaluation of the entire effort. The purpose was to weigh results of the collection missions around the periphery of the USSR against risks to the aircraft and crews. The study showed that intercept productivity was far higher than at fixed sites. The intercept was deemed of high intelligence value, and the missions were resumed.<sup>4</sup> The reason the ACRP flights had been halted was the downing of a USAF C-130 ACRP mission over Armenian USSR by Soviet fighters in September 1958, the tenth such documented shootdown of a U.S. reconnaissance aircraft since 1950.

(U) That brings us to the recent spate of media coverage of the U.S. military's aerial reconnaissance program that was directed against the Soviet Union in the 1950s and 1960s. The extensive television, newspaper, and weekly newsmagazine coverage (starting with newspaper articles<sup>5</sup> in the summer of 1992 and reaching apogee in 1993 with the ABC Television "PrimeTime Live" feature on 4 March and the extensive coverage in *U.S. News and World Report* on 15 March under the histrionic title "America's Top-Secret Spy War"<sup>6</sup>) emphasized the secrecy surrounding the many shootdowns of U.S. aircraft, the lost airmen, both killed and missing, the few fortunate survivors, their heroics generally and specifically, the U.S. government's less than forthcoming explanations to next of kin and, in some cases, its apparently less than aggressive confrontation of the Soviet government concerning the whereabouts and return of any captured survivors.

(U) The media touched generally and gingerly on the reasons for these missions -- the American fear of the Russian bear, the gap of Allied knowledge of Soviet military and industrial capabilities, the need for intelligence on the strengths and weaknesses of Soviet air defenses and on *what* targets to hit *where* in case of war.

~~(S)~~ What the media didn't emphasize enough, in this author's view, was that these airmen were all volunteers in that secret war. They knew the risks and were willing, in many cases eager, to take them. As early as 1947, the USAF knew the risks:

This mission is considered a most hazardous one both from the natural peril and capture standpoints. All flight personnel are volunteers and are fully apprised of possible consequences should the plane be forced to land in foreign territory. The crew is warned that in the event of detention in foreign territory repatriation will be attempted but will probably be unsuccessful. For purposes of cover the project is described as a weather mission. Equipment for complete demolition of the plane and its contents has been provided. Foreign coasts are approached to within 15 or 20 miles.<sup>7</sup>

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(U) Indeed, many of these men paid the dearest price of all to help fill in the empty intelligence map of the former Soviet Union.

(U) To help the reader, perhaps new to the issue, make a more fully informed judgment about the U.S. reconnaissance program, it might be useful to add a SIGINT perspective to the media's view of the events. The reader can then decide for him or herself if what the reconnaissance crews did was worth the risk.

~~(S-CCO)~~ While SIGINT reflections of Soviet reactions to U.S. reconnaissance flights first appeared in 1950, records show that the USAF had begun flying so-called "ferret" missions against the Soviet Union as early as 1947; both B-29s and B-17s had been outfitted with

the latest (including classified) intercept and D/F and Radar equipment, [and] among other things, they were capable of intercepting very high frequency transmissions . . . that the present intent of A-2 [Air Force Intelligence] is to completely encircle the USSR with adequate intercept facilities, and that these ferret activities would appear to be well adapted for integration in this program.<sup>8</sup>

~~(S)~~ The "especially fitted B-29 electronic search aircraft" (ten B-29s were expected to be in the program by July 1948) were then operating in the Alaska, Kuril, Siberian coastal areas and had been over the North Pole; two B-17s operated in Europe "primarily in search of guided missile activity," presumably Soviet.<sup>9</sup>

(U) We know, of course, that the Soviets began to react publicly to these ferret flights in 1947, when USAF overflights of Big Diomed Island in the Bering Straits on 23 and 25 December were vigorously protested by the Soviet embassy in Washington.<sup>10</sup>

(U) In 1948, according to the noted historian Jeffrey Richelson,<sup>11</sup> the USAF made four daring overflights of the Soviet Far East. "Stripped-down" B-29 ferrets overflew "Siberia" on four twenty-hour missions, the first staging from Alaska and recovering in Japan, on 5 August, reversing the route on 8 August; and repeating the two missions on 1 and 6 September.

~~(S-CCO)~~ The first documented incident in which Soviet air defense forces attacked a U.S. reconnaissance plane took place over the Sea of Japan on 22 October 1949, when a USAF RB-29 escaped unharmed after being shot at by fighters.<sup>12</sup> For the next twenty-three years, the Soviets made over thirty documented attacks on U.S. aircraft, dozens more on Allied aircraft. But, using two criteria - (1) Soviet attacks, not North Korean, or Communist Chinese or Cuban, and (2) U.S. reconnaissance aircraft, not cargo-carrying transports, not fighters, not airliners, etc., - this author came up with thirteen shootdowns, the first on 8 April 1950, the thirteenth and last on 10 March 1964. SIGINT to one degree or another reflected all these incidents.

~~(FOUO)~~ Before reviewing the thirteen incidents in detail, it would perhaps be helpful for the reader to take a quick scan of the dates, U.S. military service and reconnaissance aircraft type, and general location of the shootdowns:

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## QUICK-LOOK SUMMARY OF SOVIET SHOOTDOWNS

Date	U.S. Service & Aircraft Type	General Location
8 April 1950	USN PB4Y2 Privateer	Barents Sea
6 November 1951	USN P2V Neptune	Sea of Japan
13 June 1952	USAF RB-29	Sea of Japan
7 October 1952	USAF RB-29	East of Hokkaido/Kuril Is.
29 July 1953	USAF RB-50	Sea of Japan
4 September 1954	USN P2V Neptune	Sea of Japan
7 November 1954	USAF RB-29	East of Hokkaido/Kuril Is.
18 April 1955	USAF RB-47	Off Kamchatka Peninsula
10 September 1956	USAF RB-50	Sea of Japan
2 September 1958	USAF C-130	Soviet Armenia (near Turkish border)
1 May 1960	CIA U-2	Sverdlovsk, USSR
1 July 1960	USAF RB-47	Barents Sea
10 March 1964	USAF RB-66	East Germany

~~(S)~~ The timeframe of these shootdowns, 1950-1964, does not do justice to the length of the program, which began in the early years of the cold war and was reportedly not terminated against the Soviet Union until March 1993. The general locations of these incidents, however, do adequately show the worldwide geographic scope of the program, with the U.S. reconnaissance aircraft involved in the incidents having taken off from airfields in Alaska, England, France, Germany, Japan, Pakistan, and Turkey.

~~(S-CCO)~~ The SIGINT picture of these shootdowns is limited. It does not show the human dimension emphasized by the media. Except in one case (7 October 1952, details below) where a crew member acknowledged the potential threat and, later, was heard to yell "Mayday" (the international cry for help), all the victims were silent in the SIGINT. For the most part, SIGINT showed only what the Soviets reported they saw on their radars and what the Soviet fighter pilots and their controllers said they were doing and what they saw happening.

~~(S-CCO)~~ Furthermore, the SIGINT picture of these shootdowns shows to some extent how the SIGINT system was performing in terms of collection, processing, and reporting

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(especially NSA reporting completeness and timeliness) during the early cold war years from 1950 to 1964.

~~(S-CCO)~~ The SIGINT shows, for example, that the field sites were apparently not privy early on to either the schedule times or planned flight routes of the reconnaissance missions, and they were forced to infer a great deal from the intercepted Soviet radar tracking reports and fighter pilot chatter after they were informed that a reconnaissance plane had not returned. Providing SIGINT intercept stations with advanced information on the reconnaissance missions would be a necessary prerequisite to development of an effective warning system for the aircraft themselves.

(U) It is with these purposes in mind the the following is provided (except for figure 2, all geographic representations of the flight tracking of the reconnaissance aircraft and/or the intercepting fighters are reproductions from original SIGINT documents.)

8 April 1950

(U) On 29 August 1949, less than two months before the first documented Soviet attack on a U.S. reconnaissance aircraft, the Soviets acquired an additional military capability and, consequently, new secrets to protect: they detonated an atomic device at Semipalatinsk.

~~(S)~~ All things considered, the USAF RB-29, which suffered the first Soviet attack in October 1949, got off lucky. A little over five months later, the Navy would not be so fortunate. On 8 April 1950, the day before Easter, Soviet fighters shot down a U.S. Navy (USN) PB4Y2 (Privateer), with a crew of ten, over the Baltic Sea. It had the dubious distinction of being the first recorded shootdown of a U.S. reconnaissance aircraft by the Soviets, as well as the first incident probably reflected in SIGINT; there had been no SIGINT on the 1949 attack.

(U) The Privateer (see fig. 1), a Navy version of the U.S. Army Air Force's B-24 Liberator long-range bomber, was first used in electronic reconnaissance by the Navy in 1943 against the Japanese.<sup>13</sup> But in the rush to demobilize after V-J Day, the radar and radio equipment, which had been so carefully fabricated and installed in the aircraft, was ripped out and junked.

(U) In 1949, when the lack of information on the location, capabilities and technical characteristics of Soviet Bloc radar and weapon systems struck home to U.S. Navy planners, they found themselves with a dilemma, a need that they had no capability to satisfy. They solved the problem in a classic Navy way:

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When it was decided to equip two patrol squadrons to conduct the electronic reconnaissance mission, the Navy found it had insufficient equipment on hand. The Navy sent two chief electronic technicians to locate and buy back some of the equipment that previously had been sold as surplus. Wearing civilian clothes and carrying large quantities of cash, the two chiefs rooted through war surplus stores in New York City. They purchased all the intercept receivers, direction finders, pulse analyzers and other electronic reconnaissance equipment they could locate. This equipment was then repaired by Navy technicians and installed in *Privateers* and P2V *Neptunes* for the high-priority electronic reconnaissance or *Ferret* (the Air Force term used unofficially by Navy crews) missions around the periphery of the communist nations, particularly Russia.<sup>14</sup>

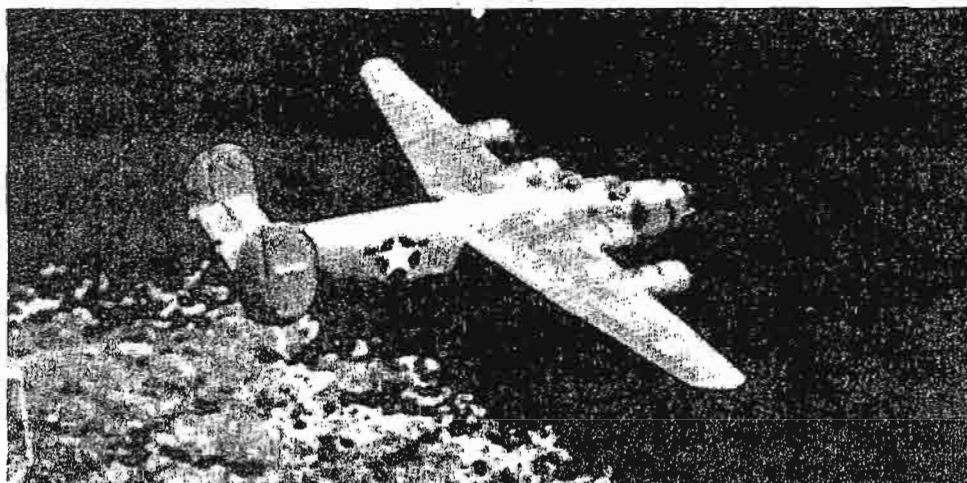


Fig.1. USN PB4Y Privateer

(U) Apart from COMINT, we know the following about the ill-fated mission: the *Privateer*, having deployed from its home base of Port Lyautey, French Morocco, earlier in April, took off from the USAF base at Wiesbaden, Germany, on a "classified mission" about seven hours before the shootdown. The aircraft reported flying over Bremerhaven, Germany, three hours later and sent its last radio report after about four hours and ten minutes of flight. Nine hours after that, USAF Flight Service in Frankfurt declared the aircraft overdue. But no one knew what happened until later when the the Soviets reported having sighted the the Navy aircraft over Libau (now Liepaya), Latvia. Soviet fighters mistakenly identified it as a B-29 bomber, intercepted it, allegedly "exchanged fire" with it, and shot it down. "The credibility of the Soviet report was seriously weakened by the fact that the *Privateer's* only armament was a .45-cal. pistol carried by one of the officer crewmen." For the next ten days, four USN aircraft and twenty-five USAF aircraft scoured the Baltic for survivors, without success.<sup>15</sup>



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Fig. 2. USN PB4Y2 Shootdown - 8 April 1950

~~(S)~~ COMINT reflections of this flight were sparse. An April 1953 USAF Security Service (USAFSS) study<sup>16</sup> reported that Soviet HF Morse air surveillance radar tracking had been acquired and tentatively correlated it with the shootdown. What is believed to have been the Privateer was tracked for fifteen minutes, some five hours after takeoff, traveling on a 60-degree heading over water, for about fifty miles at the entrance to the Baltic Sea in the Rugen Island area (see fig. 2). A single position report was passed again at about the time of the shootdown, with the reconnaissance aircraft located twenty to twenty-five miles off the coast of Latvia. Up to five different fighters were tracked for a total of forty-five minutes (from twenty-six minutes before the attack until twenty minutes afterwards) but only one with any continuity. Tracking facilities followed the fighter flying almost due south on a collision course with the Privateer. The report backtracked the Navy reconnaissance aircraft to a position 56-30N 20-17E at the time at which the Soviets alleged that fire was exchanged.

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(U) Before the next Soviet shootdown of a U.S. reconnaissance plane, several related events took place. First, less than a month after the Baltic Sea incident, President Truman formally authorized secret reconnaissance flights against the Soviet Union.<sup>17</sup> Second, two months after the Baltic shootdown, the Korean War began. This war heightened the anxiety level in the Truman administration, raising fears of a general war with the Soviet Union and its supporting bloc countries. Third, a month after that, on 15 July 1950 a USAF B-29 "ferret" was intercepted by Soviet fighters over the Sea of Japan but escaped unscathed.<sup>18</sup>

*6 November 1951*

(U) The U.S. Navy was also the second victim of aggressive Soviet reaction against American reconnaissance missions when a P2V (Neptune), with a crew of ten, was shot down over the Sea of Japan, somewhere off of Vladivostok, on 6 November 1951.

(U) The Lockheed P2V Neptune (see fig. 3), first produced in 1945, set world nonstop distance records in 1946 before entering operational service with the Navy in 1947 as a land-based patrol aircraft. Following major design changes, including the addition of a pair of turbojets, it began to be used for electronic reconnaissance in 1950.<sup>19</sup>

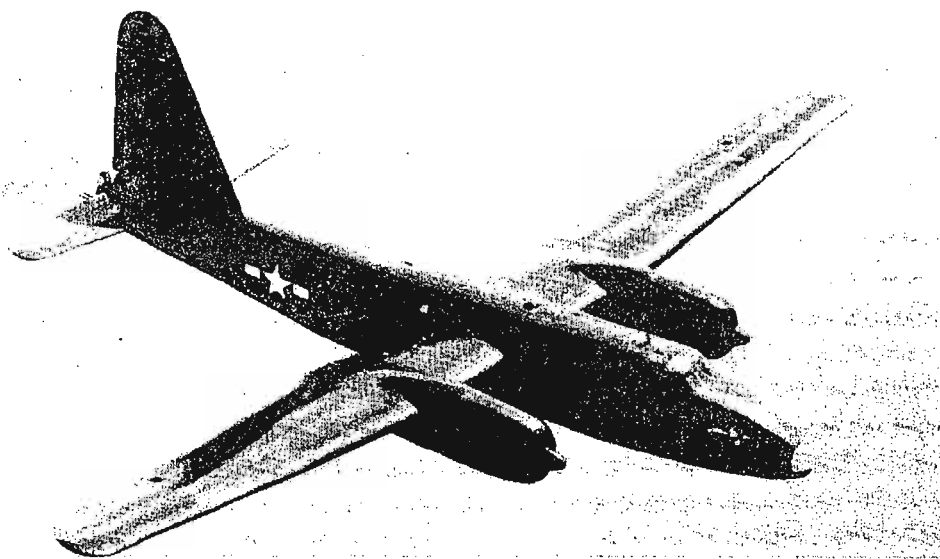


Fig. 3. USN P2V Neptune

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(~~SECRET~~) COMINT coverage of the incident was limited to HF air-ground voice communications of the reacting aircraft, including reflections of a Soviet *reconnaissance* plane escorted by two fighters. One would not know the Soviet aircraft had intercepted the U.S. aircraft except for the report from the Soviet reconnaissance aircraft some ninety minutes after becoming active: "... an aircraft of the Neptune type was detected. It was shot down. It is burning on the surface [of the sea]." Later, the controller at Vladivostok directed all aircraft to cease operations and return to base "under radio silence."<sup>20</sup>

13 June 1952

(U) The U.S. Navy was almost victimized again, on 23 January 1952, when Soviet fighters were unsuccessful in a rocket attack against a P4M (Mercator) flying a Baltic Sea mission. But the Soviets struck again on 13 June 1952, again over the Sea of Japan, when its fighters shot down a USAF RB-29 with its twelve-man crew.

(U) The RB-29, the reconnaissance version of Boeing's B-29 Superfortress, flew long-range reconnaissance missions in World War II and began to support SIGINT operations in 1948.<sup>21</sup>

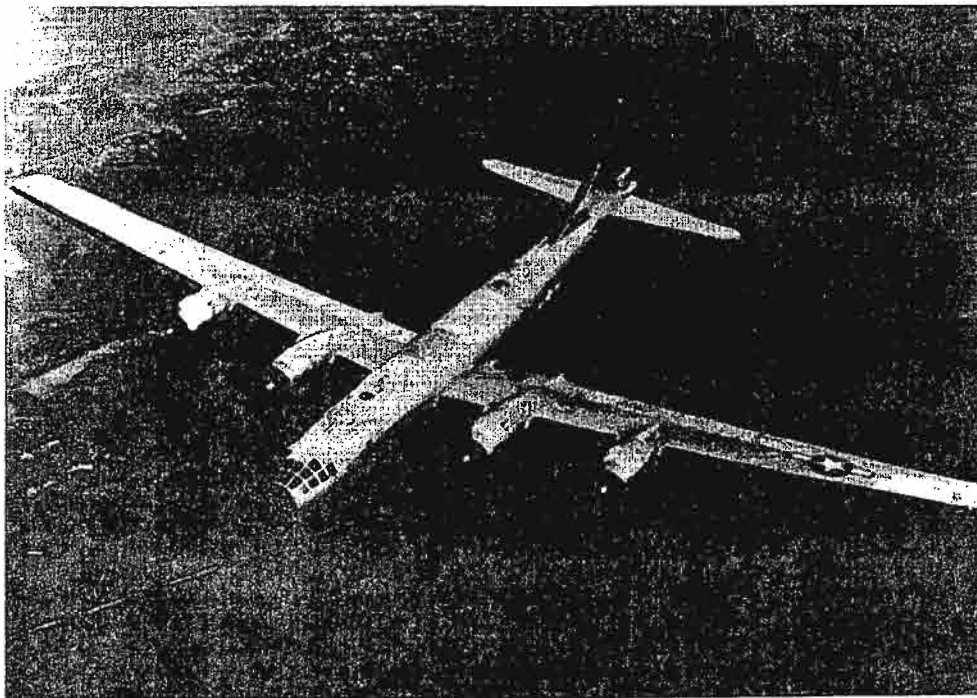


Fig. 4. USAF B-29

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~~(S)~~ Again, the COMINT reflections were sparse, tentatively correlated, and apparently recognized only after the event, if one is allowed to read timing into the following report:

In the area southeast of Vladivostok ... on 13 June 1952 ... an RB-29 ... was reported missing [emphasis added]. Between 0706Z and 0739Z, Soviet Air Warning messages possibly reflected the flight of this aircraft in the area south of Mys Ostrovnoe. Although it was not possible to determine the cause of the RB-29's loss, two 5th Fleet Air Force fighters (now Soviet Pacific Ocean Fleet Air force ...) were engaged in GCI [ground-controlled intercept] operations between 0713Z and 0753Z and were possibly vectored onto the RB-29.<sup>22</sup>

~~(S)~~ Wreckage was sighted about seventy-five nautical miles from the Soviet coast and twenty miles from the RB-29's last position reported by the Soviets.<sup>23</sup>

(U) With the war ongoing in Korea, it's not surprising that in July both a USAF B-26 weather reconnaissance aircraft and a USN Mercator were shot at by Soviet fighters over Korea Bay; both managed to escape.<sup>24</sup>

7 October 1952

(U) Less than four months after the June incident, another USAF RB-29 probable photoreconnaissance aircraft, with a crew of eight, was shot down in the Far East by Soviet fighters, this time off the east coast of Japan's most northern island of Hokkaido, near the southwestern tip of the Kuril Island chain.

~~(S)~~ COMINT reflections of this fourth incident were sketchy, based on the study published the next year.<sup>25</sup> Soviet air surveillance tracking facilities apparently picked up the RB-29 about an hour before it was shot down (see fig. 5). No tracking of any Soviet fighters was copied, but the Nemuro radar detected an aircraft coming from the direction of the Kurils about twenty minutes before the incident and warned the RB-29 crew of the presence of another aircraft. The RB-29 reportedly acknowledged the warning, reported seven minutes later that the unidentified aircraft had been spotted and that they (themselves) would remain in the area for another hour. Thirteen minutes after that report, with Soviet tracking showing the RB-29 heading eastward into the Pacific toward Soviet-claimed territorial airspace, the RB-29 sent a well-known distress message: "Mayday! Let's get the hell out of here!"<sup>26</sup>

~~(S)~~ COMINT also reflected (a) the tracks of the USAF F-84 jet fighters that were dispatched to assist the RB-29 about ten minutes before it was shot down and (b) tracking of Allied rescue aircraft for another three hours after the incident.<sup>27</sup>

(U) Subsequently, several significant world events affected the atmosphere surrounding the U.S. reconnaissance program. Leadership changes occurred: Dwight D. Eisenhower, who had a great appreciation for intelligence from reconnaissance, was elected president on 4 November 1952. Nuclear weapons became more destructive: the U.S. detonated its first thermonuclear (i.e., hydrogen) device on 1 November 1952, and the Soviets stepped up their own weapons development programs.

(U) Three reconnaissance incidents occurred. First, two USAF aircraft were shot at by Soviet fighters: a C-47 transport in the Berlin Air Corridor on 8 October 1952 and an RB-

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50 off the Kamchatka Peninsula on 15 March 1953. Second, a Royal Air Force Lincoln reconnaissance bomber was shot down over East Germany by Soviet fighters on 12 March 1953.

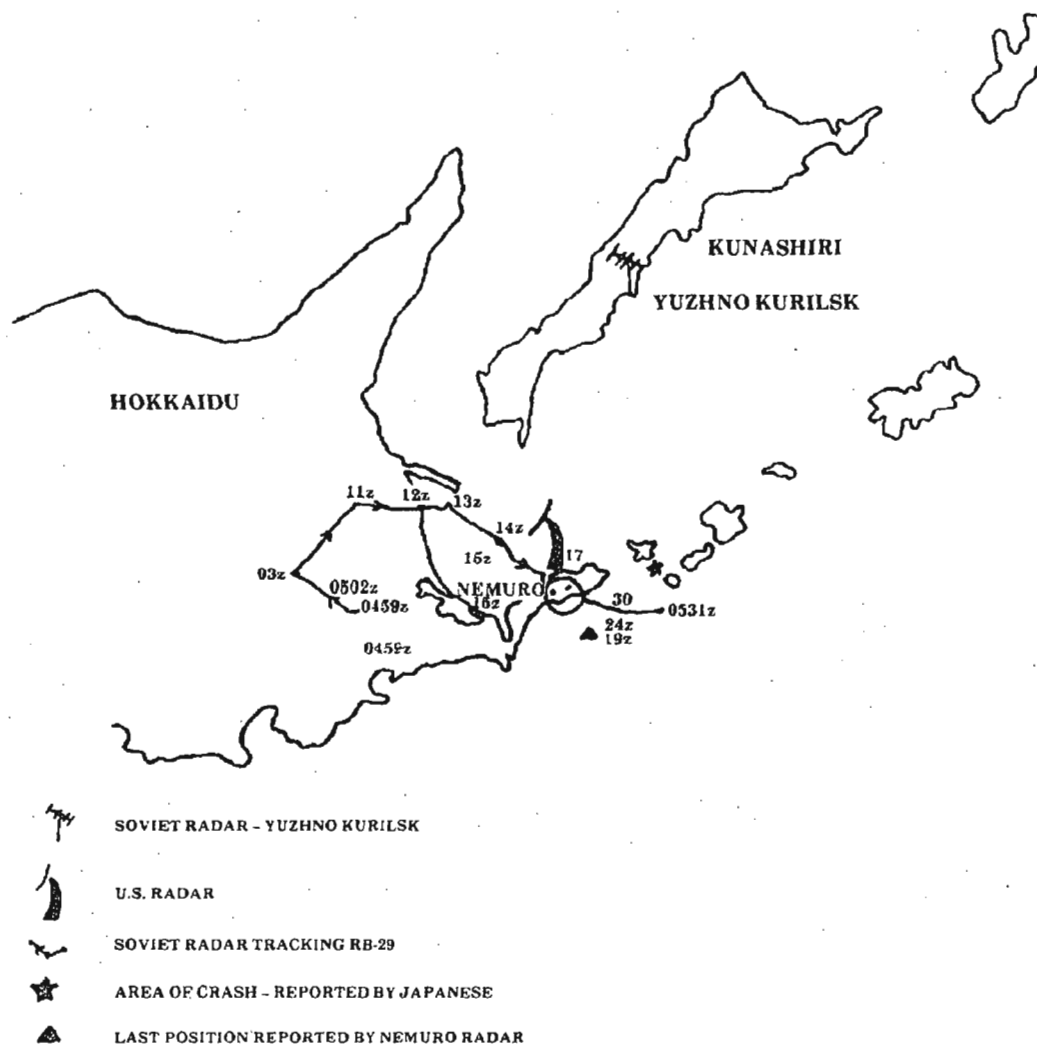


Fig. 5. USAF RB-29 Shootdown - 7 October 1952

29 July 1953

(U) Soviet MIG-15s shot down a USAF RB-50, with a crew of seventeen, over the Sea of Japan, about seventy miles southeast of Vladivostok, at about 0630 local time on the morning of 29 July 1953 (two hours after the end of the working day, Tuesday evening 28 July in Washington, D.C.). It was the first incident of this nature to begin to stimulate the kind of COMINT reporting that customers could expect from the NSA, in existence for only eight months at the time.

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~~(S-CCO)~~ The RB-50 was essentially a modified B-29 with uprated engines, a taller vertical stabilizer (see fig. 6), and, in this case, SIGINT intercept equipment. It began flying SIGINT reconnaissance missions out of Yokota AFB, Japan, in August 1951.<sup>28</sup> The NSA COMINT wrap-up report on this flight<sup>29</sup> characterized this RB-50 flight as a "VHF intercept mission."

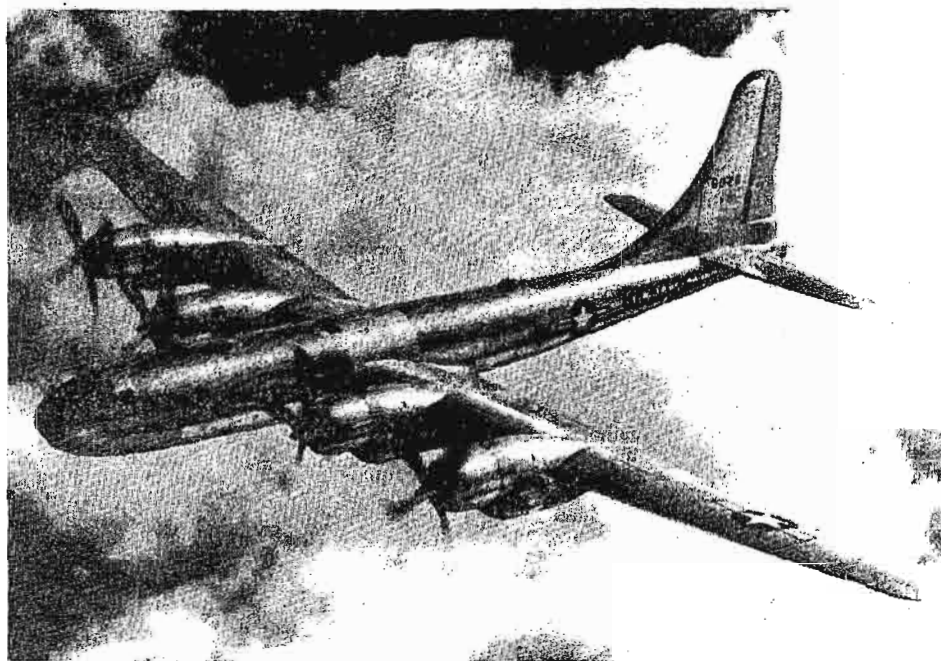


Fig. 6. USAF B-50

~~(SC)~~ COMINT reflections of the shootdown were from Soviet HF Morse (in grids) and voice (in azimuth/range) air surveillance tracking and HF radiotelephone aviation-related communications, as well as a variety of HF and VHF naval communications, and they covered a period of about fifty-four hours, starting thirty minutes before the attack, lasting until midday on 31 July, during both Soviet and American recovery efforts. The COMINT reports pointed out that the absence of HF voice *air-ground* communications indicated that the fighters were probably using VHF (100-150 MHz) voice, a capability that was being introduced on Soviet fighters during this period.

~~(SC)~~ Once again, despite the extensive COMINT intercept of the incident, inferences were required by COMINT analysts to determine which, if any, Soviet tracking information applied to the RB-50, and which specific Soviet fighter unit was responsible for the shootdown.

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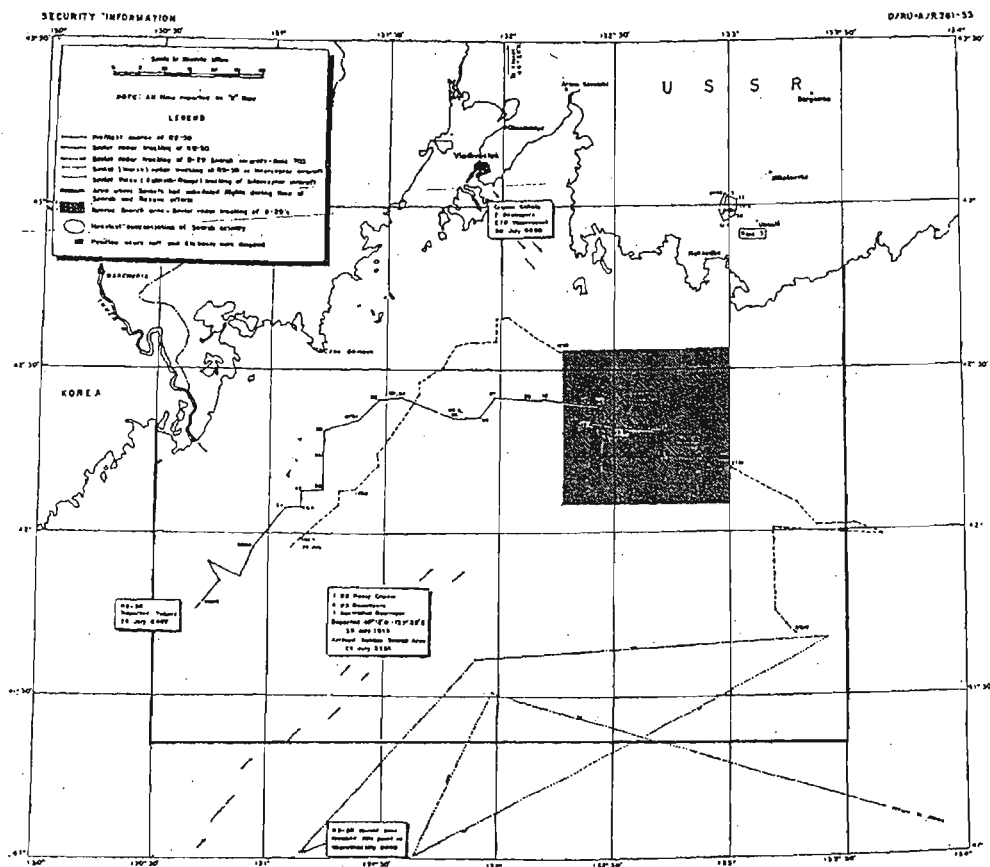


Fig. 7. USAF RB-50 Shootdown - 29 July 1953

~~(S)~~ The initial summary report, based on field reporting by the 6920th Security Group in Japan, was published some thirty hours after the event.<sup>30</sup> It had no direct COMINT evidence of any shootdown, but presented fourteen positions reported by Soviet air surveillance radar tracking stations. First, the title of the item demonstrated the tentativeness of the early intercept: "USAF Reconnaissance Aircraft *Presumed Down* [emphasis added] in Sea of Japan." Then the report cited the collateral information that the RB-50 "reported down off the southern coast of the Maritime Military District was *possibly reflected* [emphasis added] in Soviet radar tracking reports on this date."<sup>31</sup> The tracking data were incomplete and garbled, and the report pointed out the apparent disparity between the collaterally provided preflight course (the intended flight route) of the RB-50, that remained well south of the 42nd parallel and the tracking data that suggested the RB-50 flew as far north as 42 degrees 25 minutes north latitude (see fig. 7).

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the RB-50, that remained well south of the 42nd parallel and the tracking data that suggested the RB-50 flew as far north as 42 degrees 25 minutes north latitude (see fig. 7).

~~(SC)~~ NSA was on the street by 31 July with a report, the elaborate title of which was "Communications Reflections of U.S. RB-50 Aircraft Downed in Peter the Great Bay Area, 29 July 1953."<sup>32</sup> It contained such typical COMINT qualifiers as "believed to be" and "suggests," but it nonetheless left a strong impression that COMINT had reflected the shootdown and tracking of rescue aircraft:

Analysis of Soviet PVO [Air Defense] Morse and radiotelephone traffic intercepted from 0654K on 29 July through at least 0930K on 30 July reveals extensive radar tracking of 1) an unidentified aircraft, believed to be the U.S. RB-50 aircraft reported missing during a VHF intercept mission in the Far East on 29 July, and 2) other U.S. rescue aircraft. Moreover, the communications suggest that the RB-50 was intercepted by Soviet jet-fighter aircraft about 0721K 29 July in Peter The Great Bay, at approximately 42:18N 132:36E.<sup>33</sup>

~~(SC)~~ The report presented a recap of the tracking data, which contained some inaccuracies but for the first time indicated that the RB-50 was either orbiting or taking evasive action during the last three minutes of tracking. The report also contained Soviet tracking of U.S. rescue aircraft for a period of thirty minutes, beginning some four and one-half hours after the shootdown, and there was a total of five hours of tracking during the period eleven to sixteen hours after the shootdown, and for five hours again the next day.<sup>34</sup>

~~(SC)~~ Last, the report contained tracking and unit identification data on three flights of IL-28 light bombers that were observed reconnoitering the area of the incident over a period of twenty-one hours on 30 July, and flight schedules for three Soviet transports and another nine IL-28 bombers for the general area.<sup>35</sup>

~~(SC)~~ Also on 31 July, about twenty-four hours after the initial field report, USAFSS published "additional data" on the downed aircraft (the *presumed* qualifier was gone). This report,<sup>36</sup> citing the 31 July NSA report, was forthright in its conclusions, stating unqualifiedly, "A USAF RB-50 ferret aircraft operating in the Sea of Japan on 29 July was intercepted and shot down by a Soviet jet fighter in the vicinity of 42-18N 132-36E." This report wrestled with the identification of the fighters involved. Basing their judgments on the proximity of fighter bases to location of the shootdown, USAFSS analysts selected Soviet Naval Air (specifically, 5th Fleet Air Force) fighters as the culprits. The report, almost in passing, mentioned that there was extensive Soviet radar tracking of USAF aircraft engaged in rescue operations.<sup>37</sup>

~~(SC)~~ On 4 August 1953, a week after the shootdown, USAFSS, in its report based on 6920th Support Group intelligence summaries for 30 and 31 July and 1 August,<sup>38</sup> emphasized the issue of the identity of the fighters, arguing extensively and persuasively (basing their case on COMINT information such as alert duty schedules, message traffic between Khabarovsk and the suspect units, post-shootdown flight activity and the absence of 5th Fleet fighter activity) that Soviet 9th Air Army fighters, possibly of the regiment based at Khorol' airfield north of Vladivostok, were the fighters involved. A final basis for their case was, once again, the fact that 9th Air Army fighters used VHF voice, and no

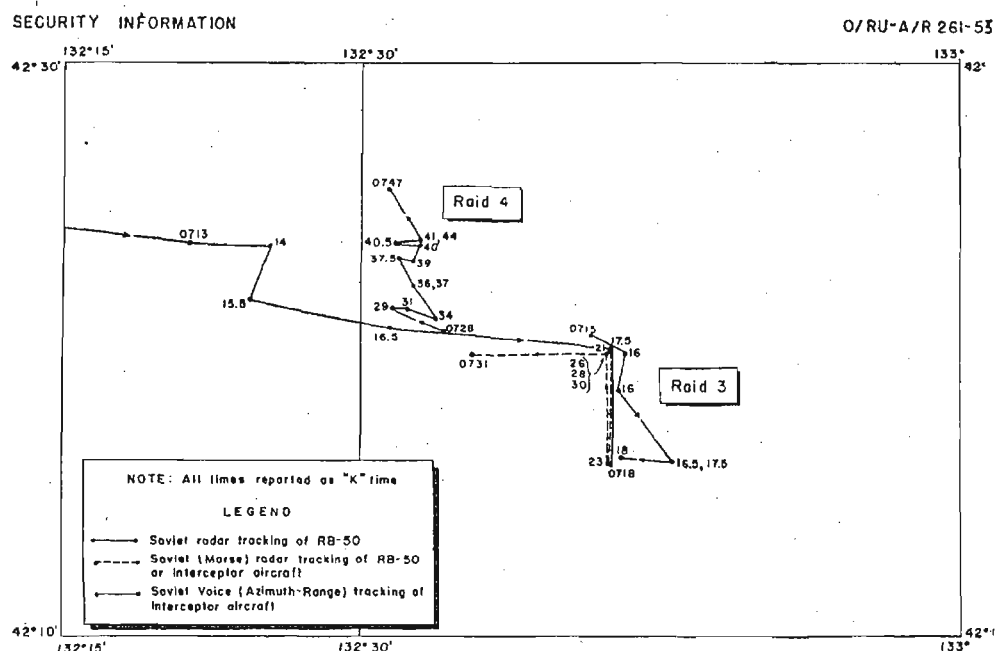


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## CRYPTOLOGIC QUARTERLY

VHF voice was copied (except probably by the destroyed RB-50 that, ironically and tragically, had both the proper intercept equipment and the line-of-sight access to the target communications).<sup>39</sup>

~~(S)~~ Finally, on 14 August 1953, about two weeks after the shootdown, NSA issued a complete and comprehensive report<sup>40</sup> that corrected the tracking errors (see fig. 8) and included additional COMINT.<sup>41</sup> The new information for readers of COMINT was that air rescue aircraft were dispatched about three hours after the shootdown, that a raft and two lifeboats were dropped where the "wreckage and at least six survivors were sighted," and that one U.S. heavy cruiser, four U.S. destroyers and one Australian destroyer from Task Force 77, operating off the Korean peninsula, were dispatched eight hours after the incident, arriving at the crash site another eight hours later.<sup>42</sup>



~~(S)~~ The Soviets also dispatched seventeen naval vessels, including the cruiser *Kalinin*, two each destroyers and submarines, and three each minelayers, minesweepers, subchasers, and unidentified and thirteen aircraft of various types into the crash area, from the morning of 30 July until noon the next day.<sup>43</sup>

~~(S)~~ More than three years later, USAFSS published a recap of "incidents" and "shootdowns" since early 1952,<sup>44</sup> which summarized the 29 July 1953 shootdown, admitting that the specific subordination of the attacking fighters was never confirmed and pointing out that "approximately 30 minutes prior to the attack . . . Soviet radar tracking reflected the U.S. aircraft as being approximately 12 nautical miles southeast of

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Cape Gamova," presumably suggesting that Soviet perceptions of a U.S. aircraft intrusion into Soviet airspace were the reason for their aggressive reaction.<sup>45</sup>

4 September 1954

(U) Over a year passed after the 29 July 1953 shootdown and after the armistice was signed, ending three years of fighting in Korea, before the sixth American reconnaissance aircraft fell victim to Soviet interceptors. All was not love and roses in the interim, however. Six U.S. reconnaissance aircraft were attacked by Chinese Communist fighters during the fifteen-month period; two were shot down. Not so incidentally, on 12 August 1953 the Soviets first detonated their own thermonuclear device.

(U) And it was the U.S. Navy's turn again to feel the bite of the Russian bear.

~~(S)~~ No timely COMINT reporting could be found that directly covered the 4 September 1954 incident, a USN P2V (Neptune) on a reconnaissance mission over the Sea of Japan shot down by two Soviet Naval MIG-17s from Unashi. The P2V crashed, with a crew of ten, not far from where the RB-29 wreckage was sighted on 13 June 1952 and where the RB-50 had been shot down fifteen months earlier (see fig. 9).

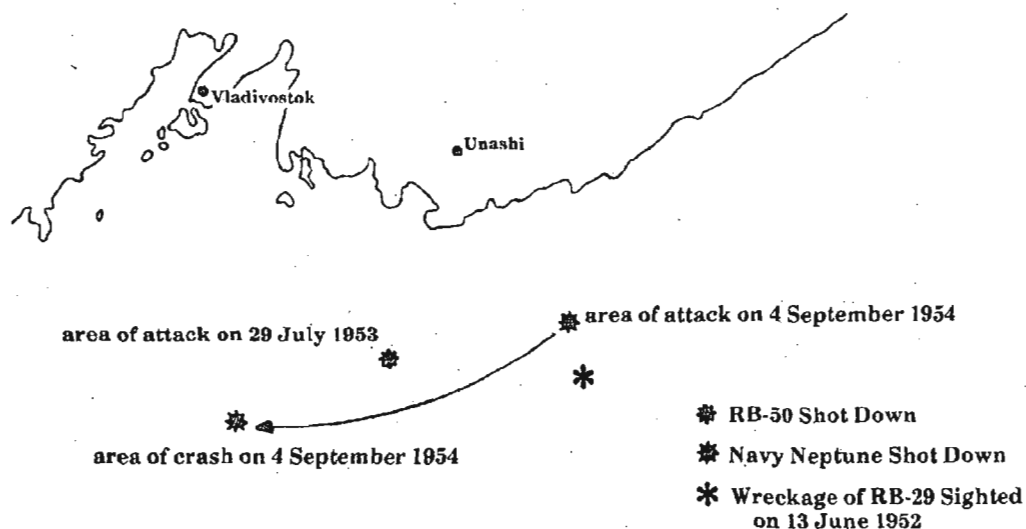


Fig. 9. USN P2V Neptune Shootdown - 4 September 1954

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CRYPTOLOGIC QUARTERLY

~~(SC)~~ USAFSS later published a study that indicated that two minutes prior to the attack, with the Navy Neptune located more than twenty nautical miles from, but heading directly north toward, the Soviet coastline, COMINT had reflected the Soviet air surveillance radar tracking stations changing the designation of the Neptune from "suspicious" to "hostile." Tracking indicated that the ill-fated aircraft turned southwest and continued to fly for another seventeen minutes before apparently crashing into the sea.<sup>46</sup>

~~(SC)~~ The 6920th Security Group Intelligence Summary (INTSUM) for 8 September 1954 reported that retranscription of the recorded VHF air-ground tactical voice communications of the shootdown indicated that one of the Uglovaya Northwest-based Soviet Naval fighters was possibly damaged by what the report called "vindictive action on the part of the Neptune," probably alluding euphemistically to the possibility that the P2V had returned fire and had damaged the fighter. About four minutes after the attack, with the fighter preparing to land at its home airfield, the pilot reported that the "oil [pressure in the engine] is 20, only 20." The pilot confirmed that his engine was, however, working, and he apparently got the fighter back on the ground safely.<sup>47</sup>

*7 November 1954*

(U) Exactly twenty-five months after a USAF RB-29 was shot down by Soviet fighters off the east coast of northern Japan in the Nemuro area (on 7 October 1952), another one met the same fate the same way. Unlike the 1952 shootdown, all eleven crewmen bailed out, ten surviving, one drowning. This all took place on the day the Soviets celebrated the October Revolution.

~~(SC)~~ The essence of the COMINT story is that two Soviet MIG-15s from the 10th Air Army Regiment T5350D at Tofutsu on the Soviet-controlled island of Kunashir in what was then called the "Lesser Kurils," attacked and shot down a Yokota-based USAF RB-29 that was reportedly on a routine photographic mission over Hokkaido. It had been tracked by Soviet air surveillance radar facilities, and Soviet fighters had been scrambled in reaction to the mission for over an hour before the actual attack took place. Finally, six minutes before the attack, the RB-29's tracking classification was changed from "suspicious" to "hostile." The MIG-15s were vectored to the vicinity of the RB-29, and the ground controller gave the command to attack, repeating the command three times over the next two minutes (see fig. 10). While the attack occurred over water, the RB-29 made it back to the mainland of Hokkaido before crashing about eleven minutes later.<sup>48</sup>

~~(SC)~~ COMINT extensively reflected this incident. There was a great deal of HF Morse tracking of the RB-29 for over an hour before the shootdown and of Soviet fighters in defensive patrols for almost two hours before, during the attack itself, and for up to four and one-half hours in defensive patrols after the incident. In addition, considerable tactical air-ground voice material was intercepted from the reacting fighters.<sup>49</sup>

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(S-CCO) Despite the wealth of intercept, it appears that all COMINT reporting occurred well after the event, beginning when the U.S. Fifth Air Force notified the 6920th Security Group almost two hours after the shootdown. It is clear that, unlike later years, the SIGINT field sites apparently were not informed in advance of U.S. airborne reconnaissance flights, at least if they were routine photoreconnaissance missions.

(SC) When the COMINT reporting began, it sputtered a bit, then flowed in a veritable gusher. First the commander of the 6920th, "under provisions of NSA circular 53-2," declared a Condition Xray Alert and issued the first of eight reports, all within a period of the next twenty-eight hours. It is instructive that the initial alert, nonetheless a COMINT report, issued about two and one-half hours after the RB-29 crashed on the island of Hokkaido on 7 November, contained no COMINT, ending with, "No addl info avail at this time."<sup>50</sup> This means that whatever the field sites had collected had not yet been processed, at least to allow reporting by the 6920th. This observation is not intended in any way as criticism, merely as a point of departure from the way reporting would eventually evolve in support of these missions.

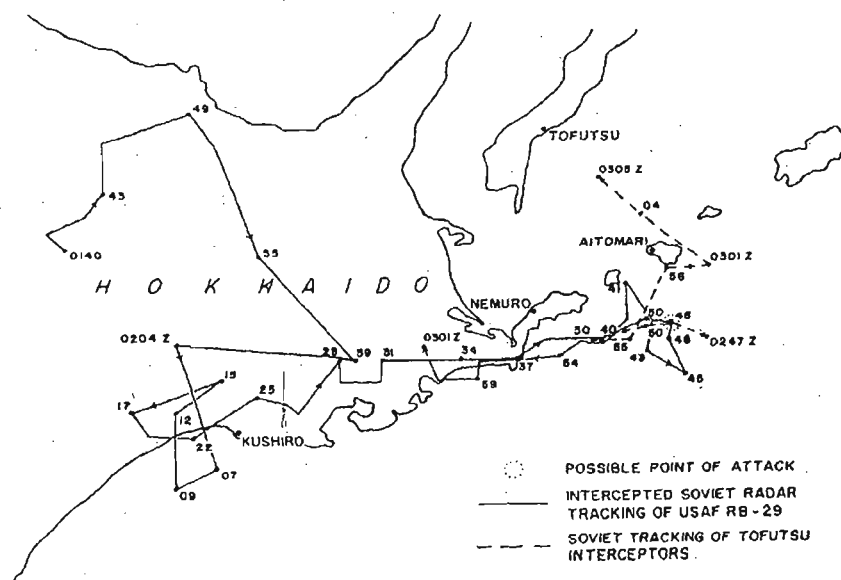


Fig. 10. USAF RB-29 Shootdown - 7 November 1954

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## CRYPTOLOGIC QUARTERLY

~~(S-CCO)~~ A little over an hour after the initial alert, the flood gates opened, and Condition Xray Two was issued, followed by another extensive report, providing analysis of tracking and voice communications about every four to five hours. It's also interesting to note that Alert Condition Xray Five, issued twelve hours after the first alert, reported that all voice material had not yet been transcribed; the complete COMINT story would not be wrapped up for another sixteen hours.<sup>51</sup>

18 April 1955

~~(FOUO)~~ Until recently confirmed as an actual shootdown by the Russians themselves,<sup>52</sup> the story of the ill-fated flight of a USAF RB-47 on 18 April 1955 is essentially one of a reconnaissance aircraft that went missing; it took off and never returned. Like six of the seven previous shootdowns, the incident occurred in the Far East, but this time not in the Sea of Japan, or over Hokkaido, but along the Kamchatka Peninsula, many miles from any supporting fighters or communications.

(U) The six-engine RB-47 was a reconnaissance version of America's first large jet bomber with swept wings (see fig. 11).<sup>53</sup>

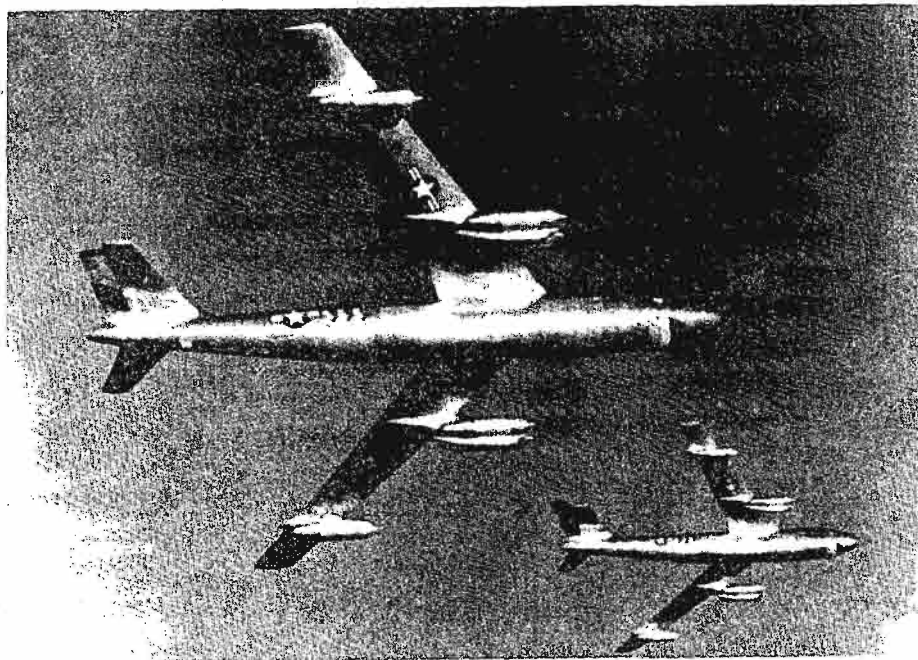


Fig. 11. USAF B-47

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~~(C)~~ The COMINT, which forms a substantial body of circumstantial evidence, remains inconclusive. The USAF RB-47 departed Eielson AFB, Alaska, on 17 April, about seven and one-half hours before the incident. It was scheduled to fly southwest along the Kamchatka Peninsula and Kuril Island chain to a point about 100 miles northeast of the Japanese island of Hokkaido and return. Eielson reported the RB-47 overdue on 18 April, 12.5 hours into a mission of an aircraft with thirteen hours of fuel. The press reported that a six-day search failed to turn up a single clue of the missing aircraft or its three-man crew.<sup>54</sup>

~~(SC)~~ Once again, the SIGINT system had intercepted both HF Morse air surveillance tracking and HF tactical air-ground voice communications that indicated a Soviet reaction to a high-performance aircraft. The time coincidence was right, but the smoking gun was not present. Soviet air surveillance radar facilities tracked a "suspicious" aircraft, exhibiting what in 1955 was high performance (575-630 knots, and altitudes of 22,890-26,160 feet), for about forty-one minutes before the possible attack and for about three minutes thereafter. Soviet interceptors were tracked off and on for almost an hour, eighteen minutes before the attack and thirty minutes after, including a period of about eight minutes in the immediate vicinity of the presumed RB-47. Analysis of the tracking shows that the interceptor broke off the surveillance/attack two to three minutes before tracking terminated on the target aircraft (see fig. 12).<sup>55</sup>

~~(SC)~~ Once again, it was not until Eielson informed USA-34, Elmendorf AFB, Alaska, and USA-34 Alert Xray was issued almost six hours after the incident that the SIGINT system apparently was made aware of the fact of a USAF reconnaissance mission planned for the Kamchatka Peninsula route. USA-34 was not sure initially that the SIGINT tracking more than "tentatively" correlated with the RB-47.<sup>56</sup>

~~(S-CCO)~~ USA-34 (called the 3rd Radio Squadron Mobile at the time) subsequently produced five follow-ups to the Alert Xray and one "spot report," covering the period of thirty-one hours. The 6920th Security Wing would issue nine Alert Xray messages, beginning with Soviet radar tracking and ending with the Alert's termination announcement, timed from almost nine hours after the attack and for over thirteen hours of the following day, a total period of some twenty-eight and one-half hours.<sup>57</sup>

~~(SC)~~ NSA's initial view can be discerned from the text of a briefing given to DIRNSA and others on 19/20 April. After describing what the tracking data showed, the briefing said:

In light of available COMINT information it is not possible to ascribe the loss of the missing RB-47 to Soviet action. There have been a number of occasions in past years when Soviet fighters established contact with USAF ferret and reconnaissance aircraft off Soviet territory yet did not attack. In this instance, while the U.S. aircraft had been labeled as 'suspicious' it [was] not designated as 'border violator' or 'hostile' at any time. Also of interest was failure of Soviet fighter units to increase the number of fighter aircraft on alert status. Normally, following Soviet attacks on U.S. aircraft, alert rosters are appreciably increased for several days. There is no evidence that such was the case after 18 April. It is also pointed out that available COMINT provides no indication of violation of Soviet-claimed airspace by the RB-47.<sup>58</sup>

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~~(SC)~~ One problem with drawing a stronger conclusion about the shootdown based on COMINT was the absence of "shootdown" talk by the reacting fighters. The HF tactical voice air-ground communications, copied from eight minutes before the possible attack until thirty minutes after, were confined to giving course headings and landing instructions to the Soviet fighters (assigned to 10th Air Army Regiment T5302B at Petropavlovsk/Khutor airfield) that had scrambled probably in reaction to the presence of the RB-47 about thirty minutes before the incident. There was no reference to an attack or firing on the target, the kind of chatter that would normally be expected following a successful shootdown. There was another problem, too. An hour after the incident, the Anadyr' radar facility reported searching for the track number that equated to the target aircraft.<sup>59</sup> The analysis was excellent, the conclusions valid, but as we know now, the plane was indeed shot down.

~~(SC)~~ Additional COMINT evidence suggesting, albeit inconclusively, the possibility of the shootdown came from Soviet naval communications. Two Soviet Naval Squadron 5 submarines based at Petropavlovsk received a "very urgent" message twenty-seven hours later, on 19 April. Subsequently, on 21 April three Soviet submarines were detected in the general area where the RB-47 is believed to have crashed.<sup>60</sup>

~~(SC)~~ Another attempted shootdown occurred on 23 June 1955, when a USN P2V-5 Neptune was attacked by Soviet fighters while on a routine shipping reconnaissance mission over the Bering Strait. The Neptune was damaged, but reached St. Lawrence Island, where it crash landed, injuring seven crewmen.<sup>61</sup>

#### *10 September 1956*

(U) Given that backdrop, we return to the Sea of Japan for the ninth incident, this time a "probable" shootdown of a USAF RB-50 on 10 September 1956. While the evidence of Soviet involvement was greater than the 18 April 1955 incident, the record that survives is far more sketchy.

~~(SC)~~ A USAF special study<sup>62</sup> summarized the incident thusly: "USAF RB-50 'lost in typhoon,' possibly as a result of Soviet fighter attack. COMINT reflected tracking data on Soviet fighters."

~~(SC)~~ USN-39 (Misawa, Japan) provided some supplemental information to the otherwise bleak COMINT picture. Two days after the incident, and for two days after that, USN-39 reported preflight schedules for two IL-28 aircraft from the Soviet 50th Independent Reconnaissance Air Regiment at Novorossiyskoe for 5.5-hour overflights of the search area.<sup>63</sup> Three days after the apparent shootdown, USN-39 also reported that there were indications that at least one Soviet submarine was operating in the vicinity of ongoing search operations in the Sea of Japan.<sup>64</sup>



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CRYPTOLOGIC QUARTERLY

*2 September 1958*

(U) One of the better-known shootdowns, the tenth in this series, took place on 2 September 1958, in the southwest corner of the Soviet Union. A USAF C-130, with a crew of seventeen, probably accidentally entered Soviet Armenian airspace near the Turkish border, was pounced on by four to six Soviet fighters and brutally shot down.<sup>65</sup>

~~(S)~~ Because the ACRP program "had proven so valuable to the National COMINT effort" in 1958, Headquarters USAF "readily" approved the allocation of eight C-130A transports (see fig. 13) to USAFSS, first to replace the weary RB-50s, and, second, in an effort to improve the effectiveness of the program. The first two aircraft, each equipped with ten intercept positions, arrived in Rhein Main AFB, Germany, in July 1958.<sup>66</sup>

~~(SC)~~ On 2 September 1958, the C-130, carrying a front-end crew of six and eleven USAFSS Russian linguists and collection operators and staging out of Adana, Turkey, was initially detected by Soviet air surveillance radar facilities about thirty-two minutes before the shootdown. Soviet radar tracked the aircraft as it flew generally southeast along the Turkish-Soviet border. About eleven minutes after the C-130 was detected, the first of three flights of Soviet fighters was scrambled for defensive patrols against the transport. Twenty-four minutes after being detected and eight minutes before being attacked, the C-130 mysteriously turned due east and crossed the border into Soviet Armenia (see fig. 14). Soviet ground controllers immediately vectored the second flight of two fighters to the C-130. Then, in a selection of their own words, the Soviet fighter pilots told what happened next:

I see the target, a large one . . . I am attacking the target . . . [B% The target is a transport, four-engine] . . . The target is burning . . . There's a hit! . . . The target is banking . . . I am opening fire . . . The tail assembly [B% is falling off] . . . Look at him, he will not get away, he is already falling . . . He is falling . . . The target has lost control, it is going down . . . The target has turned over . . . The target is falling . . ."<sup>67</sup>

~~(SC)~~ Although the available historical record is not clear about what COMINT site knew what COMINT when, the HF Morse and voice tracking data were presumably from U.S. intercept and should have been, therefore, immediately available to the SIGINT system. Only the VHF tactical air-ground voice communications, which, as we shall see below, were provided later by Turkey's COMINT organization. But the tracking data were sufficient to determine the basic outline of the tragedy. As the C-130 crossed the border into Soviet Armenia, its identification was changed from "hostile/unidentified" to "intruder." As the tracking of the second flight of fighters merged with the C-130 track, the fighters were labeled as "engaged in combat," and the C-130 was classified as "hostile/unidentified in combat." Shortly after the attack, Soviet air warning facilities broadcast a message indicating "target destroyed."<sup>68</sup>

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Fig. 13. USAF C-130

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## CRYPTOLOGIC QUARTERLY

(U) According to several accounts,<sup>69</sup> the fate of the plane and its seventeen-man crew was unknown for several days. On 6 September, the United States asked both the Soviet and Iranian governments if they had any information on their whereabouts. On 12 September, after earlier claiming to know nothing about the aircraft, the Soviet government informed the American embassy in Moscow that "a USAF aircraft has been found 55 kilometers northwest of Erevan in Soviet Armenia . . . the remains of bodies were found from which it is possible to assume that six members of the crew perished."<sup>70</sup>

(U) The next day, 13 September, the American charge d'affaires in Moscow requested information on the remaining eleven crewmembers, adding that the USAF had information that the plane had been intercepted by three Soviet fighters, "that following the interception the plane proceeded eastward under the control of the Soviet aircraft, and that shortly after this an explosion was heard and a large column of smoke was observed rising at a point within Soviet territory." The Soviets returned the six bodies (on 24 September), but denied that the C-130 had been shot down and claimed to have no further knowledge of the incident.<sup>71</sup> Despite the denial, on 19 and 20 September the Soviet newspaper *Sovetskaya Aviatsiya* published what Agency analysts believed was an actual account of the shootdown, disguised as a practice exercise.<sup>72</sup>

~~(S-CCO)~~ Finally, on 22 September came the first indication that VHF tactical air-ground voice communications had been intercepted by a Third Party. CIA in a message to NSA provided technical information and a verbatim translation of the communications provided by the Turkish National Security Service.<sup>73</sup> Four days later, two reels of tape recordings arrived; the second reel proved to be blank.<sup>74</sup> On 1 October, a second reel of voice material arrived from GCHQ.<sup>75</sup>

~~(S-CCO)~~ Two weeks later, forty-three days after the shootdown, NSA published a comprehensive COMINT report, providing detailed tracking information, discussion of the voice material, an analysis of the newspaper article, and a chart (see fig. 14) of the tracking data.<sup>76</sup> But NSA involvement in the incident was not over by any means. It appears that there were differences, as there often are in SIGINT, between what GCHQ heard on the tapes and what NSA heard and transcribed. Through the last two weeks of October 1958 and into early November, views were exchanged and tapes were retranscribed many times.<sup>77</sup>

~~(S)~~ Following several meetings between NSA and State Department representatives to resolve differences between U.S. and U.K. versions of the incident and to agree on a sanitized version of the transcript for release to the Soviet Union and to the press, the State Department on 13 November presented the Soviet ambassador to Washington with the evidence that Soviet fighters had shot down the C-130 "without regard to the rules of civilized international practice."<sup>78</sup> The Soviet ambassador accepted the transcripts but refused to listen to the tape recordings. Additional representations to the Soviet government as to the whereabouts of the eleven unaccounted-for crewmen were each time rebuffed. As late as 16 January 1959, no lesser official than the First Deputy Chairman of the Council of Ministers of the USSR, Mr. Anastas I. Mikoyan, denied that the plane had

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been shot down and insisted that his government had no knowledge of the eleven missing crewmen.<sup>79</sup>

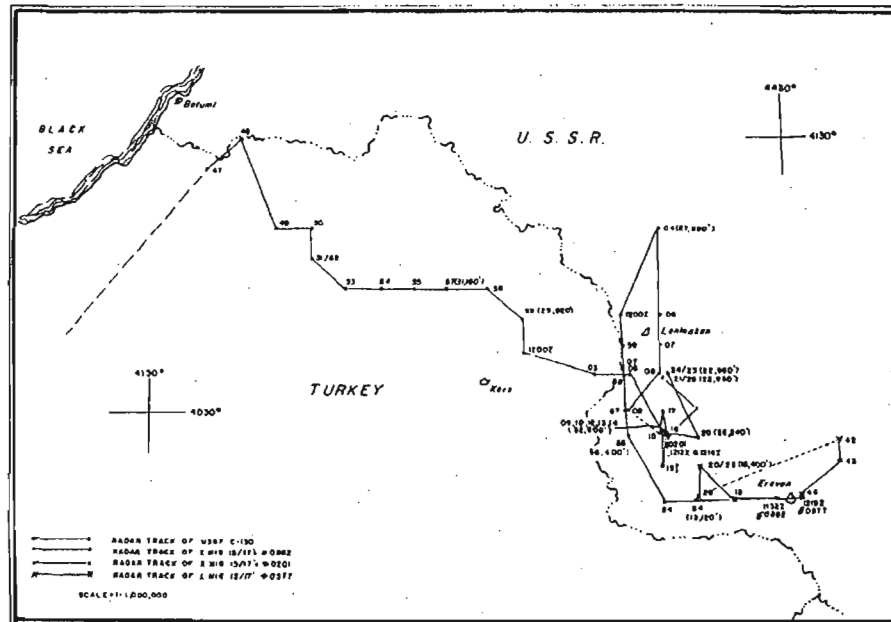


Fig. 14. USAF C-130 Shootdown - 2 September 1958

(S) Meanwhile, as early as 5 September 1958 USAF Europe removed all C-130s from ACRP missions "until further notice" (that lasted until 15 October), and curtailed the flight routes for other European ACRP missions. Headquarters USAF ordered a total reevaluation of the ACRP effort. A final development arising from the C-130 shootdown was the start of the development of a U.S. Joint Chiefs of Staff (JCS) Advisory Warning Plan that, initially, required that all reconnaissance aircraft be configured with an HF Manual Morse Advisory Warning position.<sup>80</sup>

1 May 1960

(U) So much has been published on the shootdown of Francis Gary Powers's U-2 spyplane on 1 May 1960 that it is difficult to determine what one might add to the body of literature. Also, this flight is quite different in some ways from the other twelve being recapped here; it was neither a USAF nor a USN mission, and it deliberately was flown over Soviet airspace. This flight is being included in this paper because it essentially met the two criteria: it involved a U.S. reconnaissance plane and a shootdown by Soviet weapons.

(U) For those readers who came late, and before the COMINT story is told, perhaps a short history of the U-2 and recap of the incident are in order.

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CRYPTOLOGIC QUARTERLY

(U) Although it was secret at the time, the U-2 reconnaissance plane was quietly preparing to make history in more ways than one during the middle 1950s. In the early part of the decade, the U.S. was frustrated by its inability to penetrate the Iron Curtain to gather information, especially on Soviet nuclear-delivery capabilities. In 1953, the USAF issued a requirement for a "single-seat subsonic aircraft with an operational radius of 1,500 statute miles, flying at altitudes of 70,000 feet [i.e., generally above the reach of Soviet fighters and missiles], and capable of carrying a variety of cameras."<sup>81</sup> In December 1954, Kelly Johnson of Lockheed's "Skunk Works" had been given the go-ahead to build the U-2 (see fig. 15). It made its first test flight on 29 July 1955 and its first overflight of the Soviet Union on 4 July 1956. Before the fateful day of 1 May 1960, the U-2 made between twenty and thirty overflights of the Soviet Union.<sup>82</sup>

(U) One of the most recent authorities on the subject tells about the beginning of the famous flight:

On May 1, 1960, just fifteen days before a scheduled four-power summit conference was to convene in Paris, Gary Powers's U-2 airplane was brought down by an indirect hit from a near-miss SA-2 [surface-to-air] missile near Sverdlovsk, in the USSR. Powers would later relate that there was an explosion behind him, followed by a brilliant orange light, while he was flying at an altitude of about 70,000 feet . . . Powers's flight had begun at Peshawar, Pakistan, passed over Stalinabad, the Tyura Tam Missile Test Center, the nuclear plants in the Urals, and was to proceed to the ICBM missile base under construction at Yurya, the missile test center at Plesetsk, the submarine shipyard at Severodvinsk, the naval bases at Murmansk, and then on to Bodo, Norway.<sup>83</sup>

(U) To make a long story somewhat shorter, Powers bailed out, landed safely, was captured, tried in a show trial on 17 August, convicted and sentenced to ten years in prison. He served only twenty months, however, before being exchanged on 10 February 1962 for the Soviet KGB spy Colonel Rudolf Abel.

~~(SC)~~ The COMINT story of the U-2 shootdown is a classic case of excellent reporting of an incident about which the SIGINT system apparently had no advance knowledge. On 2 May 1960, before the U.S. knew that Powers had survived the shootdown, NSA issued a single spot report with the typically vague, but essentially accurate if incomplete, title: "Unidentified Intruder Aircraft Tracked into Interior of European USSR, 1 May 1960."<sup>84</sup> Obviously based on collection of Soviet HF Morse air surveillance radar tracking data, the report, in its sterile, carefully qualified, COMINT style, tells about an unidentified high-performance aircraft that was tracked by Soviet air defense facilities for almost four hours from a point in Afghanistan near the Soviet border, across the Tashkent area, east of the Aral Sea near the Tyura Tam Missile Test rangehead, and to the general area of Sverdlovsk where "tracking terminated." The NSA report points out "the majority of its flight to be operating at altitudes above 60,000 feet . . ."<sup>85</sup> Again, the NSA report ends with a typically understated comment:

The extensive Soviet tracking reflections of the target aircraft, its unusual itinerary, the identification of "hostile" and "unidentified" given it by Soviet air warning reporting facilities and the fighter reaction imply that it was a non-Soviet aircraft and not an exercise. No additional information is available at this time.<sup>86</sup>

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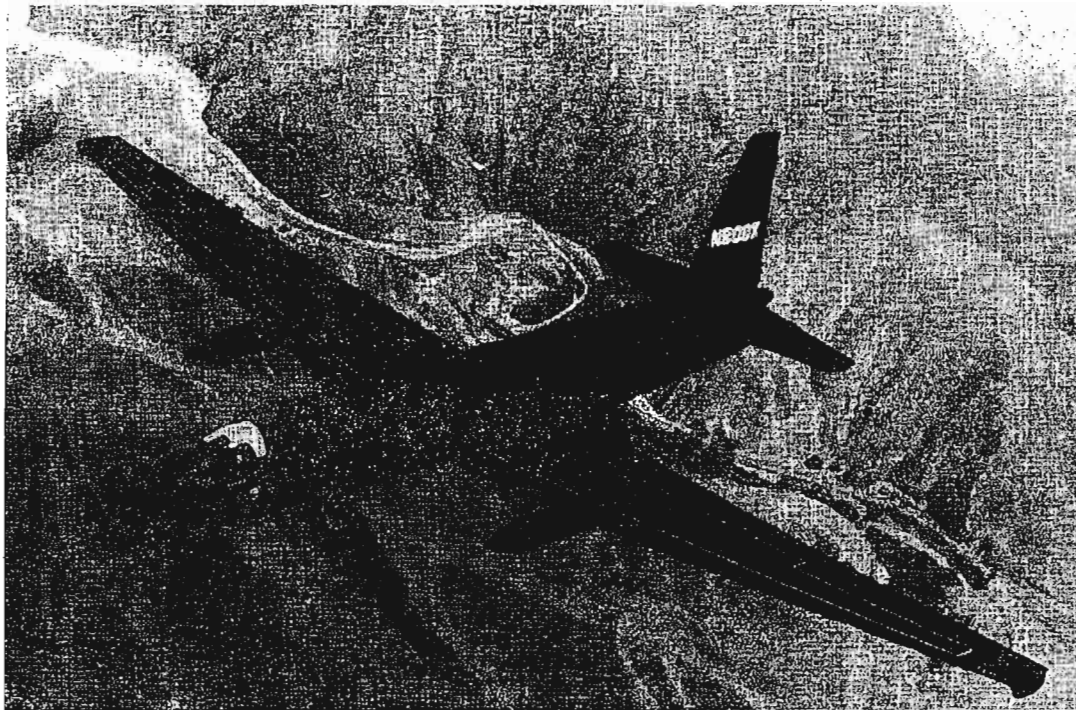


Fig. 15. CIA U-2

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## CRYPTOLOGIC QUARTERLY

1 July 1960

(U) Although it had been almost four years since an American reconnaissance aircraft that did not actually overfly Soviet territory was shot down (10 September 1956), and despite several attempted shootdowns, it was *exactly* two months to the day after the U-2 incident that a USAF RB-47, with its six-man crew, was brought down over the Barents Sea with the loss of four men, one confirmed killed.

(U) The USAF RB-47 electronic reconnaissance aircraft took off from Brize Norton Airfield, England, about five hours before the attack, flew north along the coast of Norway, entered the Barents Sea and turned southeast to follow a preplanned flight route parallel to the Kola Peninsula, Kolguyev Island, and Novaya Zemlya. As the RB-47 passed the Murmansk area, about fifteen minutes before the attack, Soviet fighters were launched in reaction. After the shootdown, probably all six crewmen bailed out, but only two men, the co-pilot and the navigator, survived the splashdown into the icy waters of the Barents. After being picked up by Soviet fishing trawlers, the two men were flown to Moscow, imprisoned in solitary confinement in Lubyanka prison, interrogated intensively and at length, and finally released in January 1961, apparently as a goodwill offering to the newly inaugurated President Kennedy.<sup>87</sup>

(U) The Soviets claimed that the aircraft was shot down over Soviet airspace after it had "violated the state frontier of the USSR."<sup>88</sup> It may be some consolation that Oleg Penkovskiy, a senior Soviet military intelligence officer who spied for British and American intelligence in the early 1960s, said of the incident:

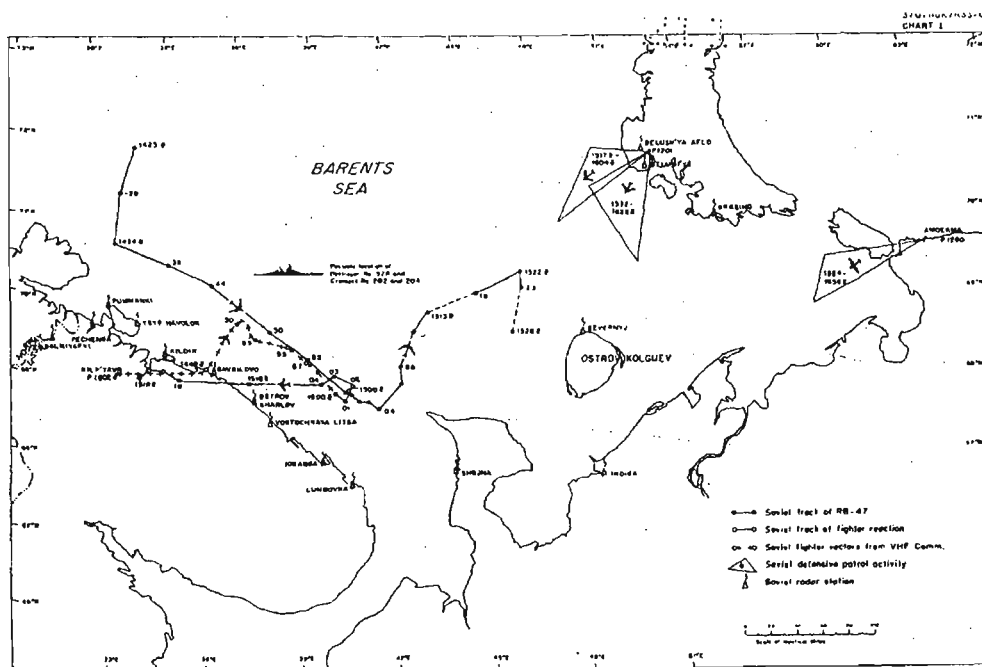


Fig. 16. Soviet reaction to USAF RB-47, 1 July 1960.

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The U.S. aircraft RB-47 shot down on Khrushchev's order was not flying over Soviet territory; it was flying over neutral waters . . . . When the true facts were reported to Khrushchev, he said: "Well done, boys, keep them from even flying close."<sup>89</sup>

~~(SC)~~ COMINT reflections of the incident were plentiful. Again, VHF tactical air-ground voice intercept was provided by a Third Party, this time the Norwegians. Also, this is the first instance on record, for a downed reconnaissance aircraft, in which an advisory warning message was sent from field sites monitoring the mission. Unfortunately, if the report was received (there is no mention of receipt of such a warning in unclassified testimony by either of the two survivors), it would have come about five minutes after the RB-47 had probably been fatally damaged by gunfire.<sup>90</sup>

~~(SC)~~ Soviet air surveillance tracking facilities initially reflected the RB-47 over 100 nautical miles out to sea forty minutes before shootdown. Fighters were launched sixteen minutes later. The Soviet pilot, probably flying a MIG-19 and believed to have been responsible for the shootdown, reported about thirteen minutes before the actual attack that he had readied his weapons. As he closed on the RB-47, he began having difficulty communicating with his controller, and started using another fighter for relay. Communications further deteriorated, and it is not clear what the controller's response was when the pilot asked if he should open fire. A few minutes later, while returning to base, the pilot made it pretty clear to all, however, that he had been successful: "[B% It is no more/I do not have it] . . . I'll explain on the ground . . . A four-engine American [actually the RB-47 has six engines, but only four engine pods] . . . Have them prepare a unit of fire [believed to refer to a basic load of ammunition] . . . Yes, most likely a half [load]."<sup>91</sup>

~~(SC)~~ Because Soviet radar continued to track the target aircraft for twenty to twenty-six minutes after the attack (see fig. 16), NSA, having no conclusive evidence of a shootdown, and despite Soviet claims to that effect, concluded on 15 August 1960:

Since Soviet radar tracking indicates that the RB-47 returned to and continued on its scheduled flight route, it is suggested that the probable earlier attack did not damage the aircraft critically. The means of destruction and details surrounding the actual shootdown of the USAF RB-47 are not known at this time.<sup>92</sup>

~~(SC)~~ We are told, however, in the survivors' story<sup>93</sup> that the pilot fought successfully to level off the aircraft after it had gone into a spin, having lost two of its three left engines. Furthermore, there was speculation, supported by the COMINT tracking and apparently believed by UN ambassador Henry Cabot Lodge, who declared at a United Nations Security Council meeting on the incident that, after everyone had bailed out, the aircraft "was still in the air twenty minutes later, over the high seas, 200 miles from the point alleged by the Soviet Union and flying in a northeasterly direction."<sup>94</sup>



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(U) It says something commendatory for the U.S advisory warning systems, initiated after the 2 September 1958 tragedy and spurred into full development after the 1 July 1960 shootdown, that subsequently there were so many reconnaissance missions flown against the Soviet Union, and *no* fatal incidents (about which more in the Epilogue).

(U) But, according to available records, there was one more shootdown of a U.S. reconnaissance aircraft by Soviet fighters.

(U) On 10 March 1964, a USAF RB-66 photoreconnaissance aircraft deviated from its scheduled route over West Germany, crossed the border into East Germany and was shot down; the crew of three parachuted safely, were captured and eventually freed.

(U) The twin-engine USAF RB-66 Destroyer (see fig. 17) was created by the Douglas Aircraft Company from its design for the USN A3D-1 Sky Warrior.<sup>95</sup> The RB-66's first flight in June 1954 was not a success, however. The aircraft "did not handle well, it

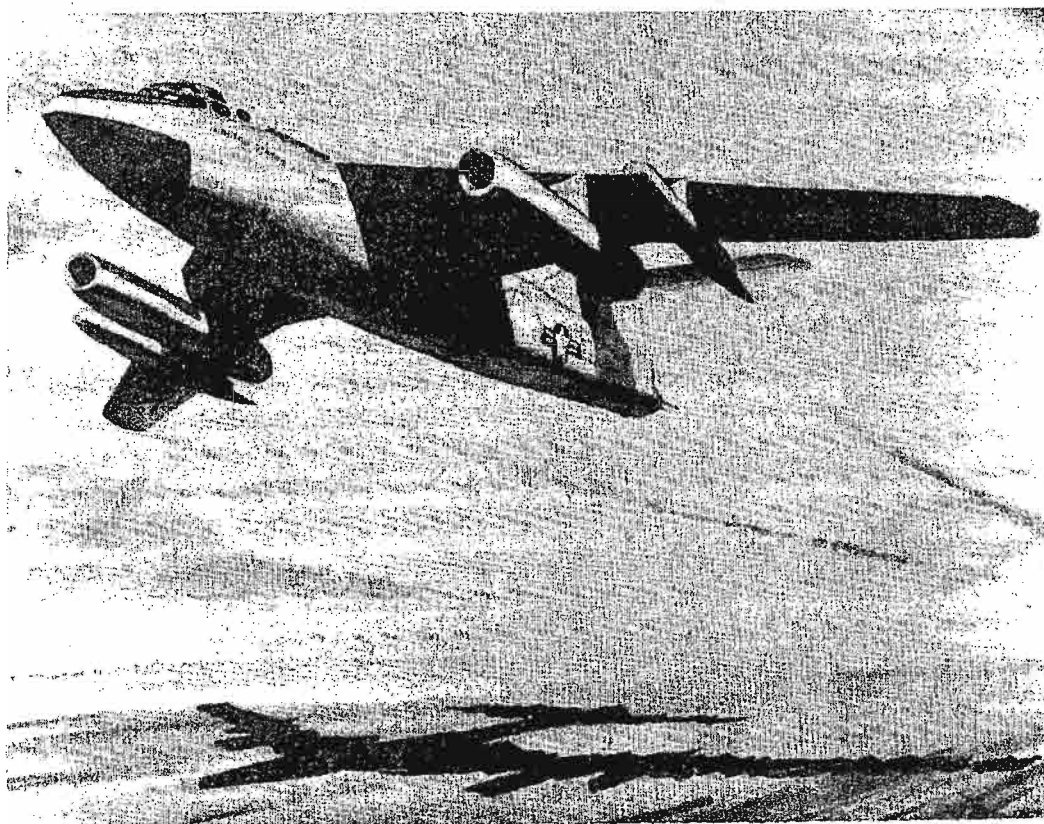


Fig. 17. USAF B-66.

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pitched up unexpectedly, the wings vibrated excessively, the vision from the canopy was poor, and the landing gear doors did not function properly."<sup>96</sup> Nevertheless, work continued and an "improved" RB-66B made its first flight in October 1955 and entered operational service as a photoreconnaissance asset in 1956.<sup>97</sup>

(U) An authorized USAF history describes further problems of one RB-66 a few years later:

On 10 March 1964, an RB-66B of the 10th Tactical Reconnaissance Wing, a unit of USAFE's Third Air Force, took off from Toul-Rosieres Air Base, France, on a flight scheduled to carry it into West Germany. *Malfunction of the RB-66's compass* [emphasis added] and the crew's failure to recognize the problem brought the aircraft over East Germany, where it was shot down. After seeing the enemy interceptors, the crew ejected, landed, and was taken prisoner. No one was seriously injured, and the 3 crewmen were released before the end of March.<sup>98</sup>

~~(SC)~~ SIGINT saw the shootdown somewhat differently. Clearly, the planned flight route of the RB-66 (see fig. 18) kept it safely over West German airspace.<sup>99</sup>

~~(SC)~~ And, as can be seen from the actual flight route, based on Soviet air surveillance radar tracking and SWAMP semiautomatic air defense data system reporting (see fig. 19), the RB-66 certainly did deviate from the scheduled route. Fourteen minutes before being shot down, the RB-66 made a sharp right turn off of its northern flight route and proceeded due east, entering East German airspace on a track placing it equidistant from the northern and southern borders, six minutes later. The reconnaissance plane then took a southeasterly heading, departed the corridor, quickly cut back sharply to a due north heading, while beginning a descent from about 33,000 feet. Before changing to a northwesterly heading at about the same time it was attacked, the RB-66 was in a descent between 21,000 and 14,000 feet.<sup>100</sup>

~~(SC)~~ As the RB-66 approached the East German border, the Northern Fighter Corps (NFC), which had responsibility for air defense of the northern half of East Germany, had one Wittstock-based MIG-19 fighter already airborne in a defensive patrol and immediately launched a second. Both were vectored toward the intruder. The Southern Fighter Corps (SFC), responsible for defending the southern half of the country, scrambled two Zerbst-based MIG-19s about two minutes before the RB-66 entered East Germany. The NFC MIG-19 on a defensive patrol was the first to spot the RB-66 just as it crossed the border.<sup>101</sup>

~~(SC)~~ Both pairs of fighters intercepted the RB-66, and at least three interceptors made firing passes, occasionally getting in each other's way. Although the NFC and SFC fighters were operating on different voice channels, their respective GCI controllers were aware of the other pair's activities and locations, and attempted to coordinate their attacks. Again, let's let the Soviet fighter pilots tell what happened in a translated selection of their own words:

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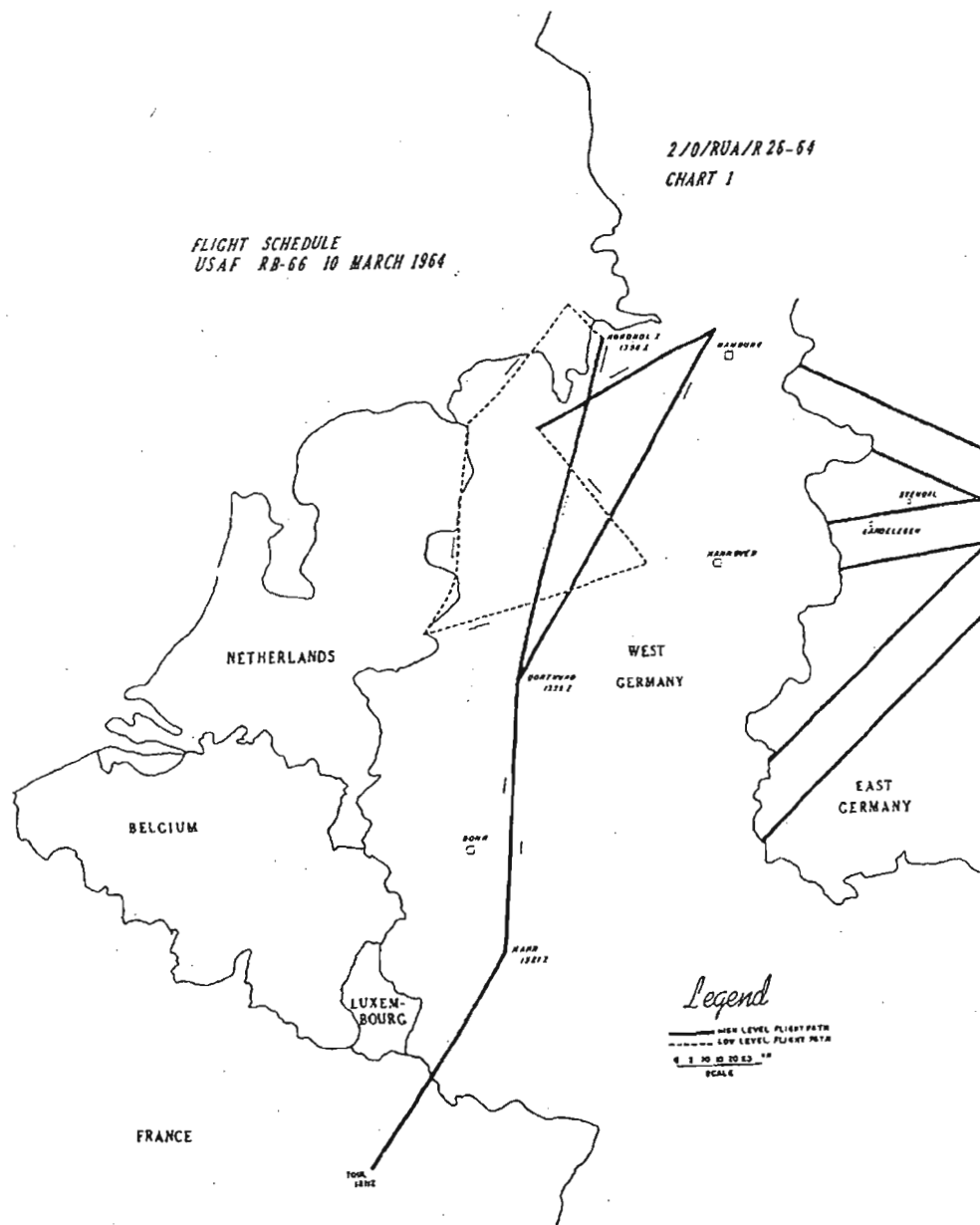
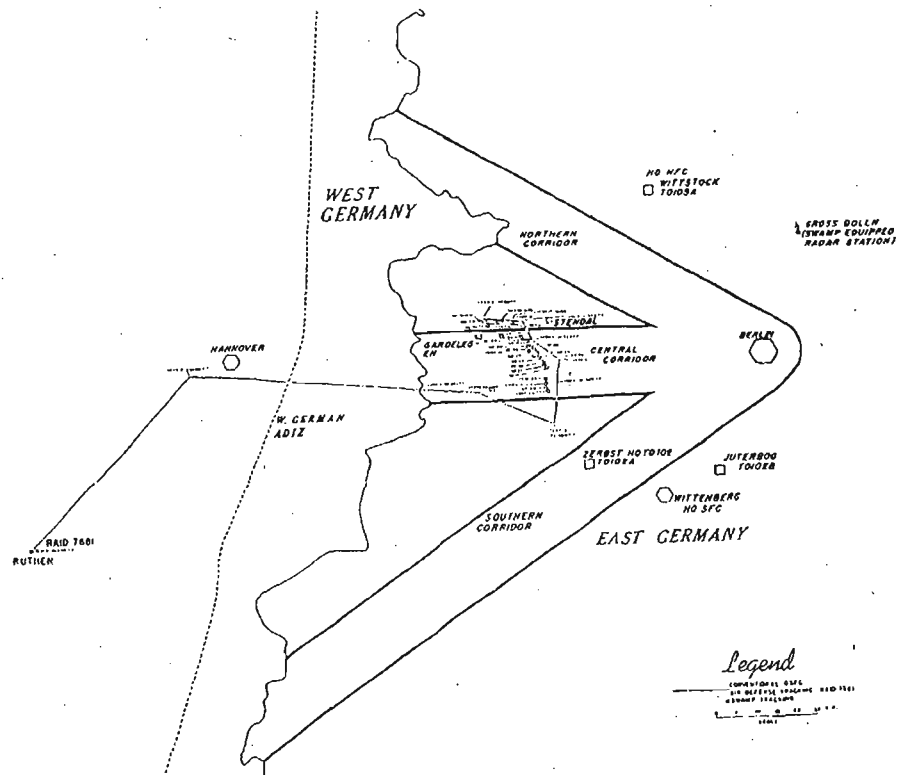


Fig. 18.

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Roger, I see. I see the target. The contrail is [coming] toward me from the front. ... American ... Yes, I'm flying with him right now .... I am starting my attack run .... I am overtaking it now .... Roger, I have readied 2 cannon .... The target is turning to the left ... The target is a swept-wing twin-jet .... Have the one who is attacking move off to the right. I'll hit him .... I will fire now .... [I] hit the target .... Let's attack again .... It's an American B-66 .... It's burning .... B-66 .... The target is going down, banking somewhat to the right .... My cannon won't fire .... Now, I'll give it another try .... The switch is on .... I have fired all .... It is burning .... The target has gone into a left turn, its bank is getting steeper ... 60 degrees ... I see a parachutist .... It exploded, and there are two parachutists .... The parachutes opened .... It exploded on the ground .... Three parachutists .... Give my regards to the armorers ... <sup>102</sup>



**Fig. 19. 10 March 1964 Tracking**

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~~(S)~~ During the hectic ten minutes between the entry of the RB-66 into East German airspace and the shootdown, an Allied air controller in Berlin appeared to be (in English) attempting to alert an aircraft, probably the RB-66, and others in the area that there was an emergency. The controller kept instructing the aircraft: "If you read, squawk emergency" and so on.<sup>103</sup>

~~(S)~~ Compared to the previous incidents, the SIGINT reflections of the shootdown of the RB-66 were significant for several reasons. One was the large variety of SIGINT sources available. In addition to the collateral provided by the USAF, the following were intercepted:

- a. VHF air-ground voice of the fighter intercepts (two frequencies, one for each fighter corps);
- b. UHF (R-400) multichannel clear voice communications reflecting Tactical Air Forces, East Germany, actions;
- c. "Conventional" Group of Soviet Forces Germany (GSFG) air defense tracking of the target (not the interceptors);
- d. SWAMP tracking of the target;
- e. ELINT intercept of one fighter's airborne intercept radar (Scan Odd) in firing mode, providing independent evidence of MIG-19 involvement (only MIG-19s had Scan Odd air intercept radars); and
- f. Allied Berlin Corridor Controller communications, in English, apparently reflecting attempts to alert the RB-66 that it was being attacked.

~~(S)~~ Another reason was the variety of intercept sites participating, including those of Second and Third Parties:

- a. USA-70 (Marienfelde, West Berlin); VHF NFC voice.
- b. UKA-277B (Teufelsberg, West Berlin); VHF NFC voice and Templehof Airfield Guard Channel;
- c. US-987L (Federal Republic of Germany SIGINT site); VHF SFC voice;
- d. USM-620K (West Berlin); UHF (R-400) multichannel voice;
- e. USA-73 (Hof, West Germany); VHF NFC voice;
- f. Possibly USA-53 (Bremerhaven, West Germany) and/or USA-73; "Conventional" Group Soviet Forces Germany (GSFG) air defense tracking collection.

~~(S)~~ Clearly based on extensive and timely reporting of the event by European field sites, NSA issued a summary electrical product report on same radio day, 10 March. Several changes and follow-ups were issued shortly thereafter.<sup>104</sup>

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~~(S)~~ To quote again from the NSA SIGINT wrap-up report: "The shootdown of the RB-66 on 10 March was reflected to an unprecedented extent in multichannel communications . . . <sup>105</sup> In part this was because, coincidentally, a large-scale Soviet air and air-defense exercise was just getting under way in East Germany. Its importance may be judged from the Soviet VIPs present: Marshal Konstantin A. Vershinin, Commander in Chief of the Soviet Air Forces; and Marshal of the Soviet Union Ivan Kh. Bagramyan, Deputy Minister of Defense and Chief of Rear Services, Ministry of Defense. Also possibly present was Colonel-General Brajko, Chief of Staff, Soviet Air Forces. <sup>106</sup>

~~(S)~~ Coincidentally, too, the Soviets had scheduled a series of simulated nuclear strikes for the high-level visitors in the Stendal area, the first demonstration planned for about eight minutes after the RB-66 entered East German airspace. The RB-66 penetration generated "obvious consternation" in Soviet authorities who "frantically passed instructions in the clear over R-400 facilities, even though speech privacy equipment was available." Soviet officials were determined to prevent the RB-66 from escaping and ordered MIG-21s into the air (which proved unnecessary). Generals were heard discussing the fate of the American crew, ordering a helicopter and armed Soviet crew to join in the search for them. Later, the American crew was reported to have gone to the hospital (probably for cautionary physical examinations, since none was seriously injured), and there was discussion indicating that the Soviets decided to exploit the incident for its propaganda value. <sup>107</sup>

~~(S)~~ Looking back at the event, almost thirty years later, it is amazing what a coincidence it was that an American tactical photoreconnaissance aircraft broke its compass, happened to wander into East Germany, and was making a descending pass directly in line for a flyover of the Stendal area timed precisely to coincide with the scheduled high-level Soviet military demonstration.

~~(S-CCO)~~ Was this overflight of East German airspace accidental? NSA officials responsible for reconnaissance reaction reporting responded as if it were. On 1 April 1964, NSA recommended a change to the criteria for an intercept station issuing a warning: "when COMINT intercept of Communist radar tracking reveals a recon[naissance] aircraft inadvertently overflying Communist territory." <sup>108</sup> The essence of the proposed change, which would make it mandatory for U.S. reconnaissance aircraft to abort when alerted (not just to recheck their navigational equipment), was accepted. <sup>109</sup>

#### EPILOGUE

~~(S-CCO)~~ Although there apparently had been isolated cases where "jury-rigged" attempts were made to alert reconnaissance aircraft in trouble, <sup>110</sup> before the 2 September 1958 shootdown no formal plan existed for warning the reconnaissance aircraft during a flight. <sup>111</sup> By 1961, USAFSS had implemented a limited advisory warning plan designed to protect SAC/USAFSS ACRP aircraft. <sup>112</sup> And by mid-1963, the Joint Chiefs of Staff had

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implemented an elaborate White Wolf Advisory Warning Program to protect American aircraft flying reconnaissance missions essentially worldwide.<sup>113</sup>

~~(S)~~ The seemingly simple idea to warn an aircraft that it is under attack is no easy project to implement. When the decision was made to develop a system to warn reconnaissance aircraft of hostile intent, the answers to many questions had to be found. Just how does one warn an aircraft? By radio, of course. What kind of radio, what frequency range, HF, VHF? What specific frequency? By voice or Morse? How do you get the crew's attention? How does the crew know it's a legitimate warning? How do you transmit the warning securely so that the Soviets won't detect what's being done and develop a counter program to transmit bogus warnings and scare off reconnaissance aircraft? What criteria do you use for transmitting a warning? Just hostile intent? How about when the aircraft gets too close to or enters Soviet-controlled airspace? If the source of the alert comes from COMINT, how do you sanitize the source for uncleared front-end crews? Who sends the alert - a COMINT field station or the reconnaissance unit's flight controller? Who else should be notified? How often do you repeat the warning if you observe no reaction? Do you inform the aircraft that the capability to warn it has been lost, giving the pilot the option to abort the mission? (Yes, to the last question, by the way.)

~~(S-CCO)~~ Those questions were answered satisfactorily and, according to available records, following the introduction of the White Wolf plan, no American airman or seaman involved in a reconnaissance missions against the Soviet Union or European Warsaw Pact country was lost thereafter as a result of being shot down by Soviet weapons. (Those readers who recall the loss of a USAF RB-57 over the Black Sea in December 1965, should also remember that NSA concluded that there was "no indication of Soviet involvement" in that incident.)<sup>114</sup>

~~(S)~~ But the intelligence collection continued. Airborne SIGINT collection aircraft continued to fly peripheral reconnaissance missions. From ELINT collection, it was possible to catalog the location and technical parameters of Soviet radars of ground-based search, surveillance, and weapon system radars, surface-to-air missile radars, and aircraft radars whether in search or track mode, documenting any detected weaknesses in Soviet air defenses. From COMINT collection, mostly VHF air-ground voice communications, it was possible to establish, maintain and update order of battle information on Soviet fighters and their weapon systems. Later, airborne collection probed multichannel emitters carrying important Soviet military command, control and communications intelligence.

(U) One interesting interpretative view of the airborne reconnaissance program is worthy of serious consideration. This view posits that while the *purpose* of the program was to collect intelligence, one of the *consequences* was its contribution to the prevention of general hostilities between the two superpowers. The flights in effect provided an outlet for limited violence, like a pressure release valve preventing pent-up aggression and animosities from erupting into full-scale warfare. High-level government exchanges

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usually followed each shootdown, where even steaming diplomatic waters could douse smoldering militant embers.

(U) If indeed there was pressure to be relieved, the resulting intelligence collected from the flights had to help. The collected information showed that the Russian bear's claws and teeth – among which were her fighters, radars and SAMs – while capable and dangerous, and sometimes deadly if you got too close, were not as sharp, or as long-reaching and accurate, or as numerous as her roar was loud. She had her weaknesses, and we were learning more about them every day.

(U) Looking back forty years, it may be difficult to give sufficient weight to the level of anxiety over and ignorance about the Soviet Union experienced by Americans. Moreover, the fear of another Pearl Harbor was very real. The airborne reconnaissance program helped reduce these fears by erasing the ignorance.

(U) Little of this concern prevails today. Why all the fuss?

(U) Maybe you had to be there.



~~(FOUO)~~ Mr. Peterson is currently a historian at the Center for Cryptologic History (E324). He began his career as an intercept processing specialist in the U.S. Air Force (1959-63). After his discharge, he transferred to NSA, first working as an intelligence analyst in A32 (1963-66) and later as section chief in A74 (1966-71). Subsequently, Mr. Peterson served as A Group product control officer, NSOC (1972-73); cryptologic staff officer in A8 and V5 (1973-74); cryptologic staff officer at Harrogate, England (1974-76); branch chief in A23 (1976-83); deputy chief, Current Watch Operations, A11 (1983); chief, Plans and Programs, on the A Group Programs and Budget Staff, A043 (1983-85); deputy chief, A44 (1985-88); and chief, A65 (1988-92). In 1972 Mr. Peterson was awarded a B.A. in Soviet area studies from the University of Maryland. His article "The Church Cryptogram: Birth of Our Nation's Cryptology" appeared in the Summer 1987 issue of *Cryptologic Quarterly*. Mr. Peterson is a certified Special Research Analyst, Traffic Analyst, and Editor/Writer.



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## Notes

(All materials are available at the Center for Cryptologic History (CCH)  
or in the NSA Library, unless otherwise indicated.)

1. William E. Burrows, *Deep Black: Space Espionage and National Security* (New York: Random House, 1986), 55.
2. Dino A. Brugioni, *Eyeball To Eyeball: The Inside Story of the Cuban Missile Crisis* (New York: Random House, 1990), 3.
3. (U) Bob W. Rush, *A History of the USAFSS Airborne SIGINT Reconnaissance Program (ASRP), 1950-1977*, 20 September 1977 (TSC), 8; CCH Collection, Series X.J.4.f.
4. Ibid., 12. ~~(S)~~ The relative value of national-level COMINT decreased to some extent only after overhead collection was implemented in the 1960s.
5. Spencer Rich, "50 U.S. Airmen Downed by Soviets Never Were Traced," *The Washington Post*, June 14, 1992.
6. *U.S. News and World Report*, March 15, 1993, 30-56.
7. OP-20-S [R.T. Kelly, Lt., USN, Acting] memorandum for OP-20-2 via OP-20-T, subject: Current Army Ferreting Operations, 11 August 1947 (TS); Cryptologic Archival Holding Area, Accession No. 1496, box CBPB65, NSA. Subject was "Army" ferreting because the USAF was not established until 19 September 1947, about a month later.
8. C.T.R. Adams [OP-20-G] Aide Mémoire, subject "Ferret" Activities, 17 July 1947 (TS); Cryptologic Archival Holding Area, Accession No. 1496, box CBPB65, NSA.
9. OP-20-S, Current Army Ferreting Operations.
10. Jeffrey Richelson, *American Espionage and the Soviet Target* (New York: Morrow, 1987), 120.
11. Richelson, 111; Burrows, 58-59.
12. Richelson, 121.
13. Don C. East, "The History of U.S. Naval Airborne Electronic Reconnaissance, Part I, The Pacific and VQ-1," *The Hook: Journal of Carrier Aviation* (Spring 1987), 17.
14. Ibid., 19.
15. Don C. East, "The History of U.S. Naval Airborne Electronic Reconnaissance, Part II, The European Theater and VQ-2," *The Hook: Journal of Carrier Aviation* (Summer 1987), 32.
16. (U) United States Air Force Security Service [USAFSS] Special Research Study [SRS] 31-53, *Incidents Involving Attacks Against Western Aircraft in Communist-Bloc Border Areas*, 25 May 1953 (TSC), 10-12 (hereafter cited as SRS 31-53); Cryptologic Archival Holding Area, Accession No. 23630, box G18-0310-7, NSA.
17. David Allen Rosenberg, "The Origins of Overkill," *International Security*, Spring 1983, 21, footnote 58.
18. Richelson, 122.
19. East, Part I, 19.
20. (U) SRS 31-53, 20.
21. David Donald, *Spyplane* (London: Aerospace Publishing Ltd, 1987), 15.
22. (U) AFSCC-T-56-19442, USAFSS SRS No. 27-56, *Resumé of "Incidents or "Shoot Downs" Related to U.S. or Allied Flights near Communist Territory*, 14 September 1956 (TSC), 5; Cryptologic Archival Holding Area, Accession No. 24894, box CBNL15, NSA.
23. Ibid.
24. (U) T542 study titled: *A Summary of Peacetime Hostile Air and Air Actions, 1949-1985*, March 1986 (S-CCO); CCH Crisis Collection, Series VIII, box "O."
25. (U) SRS 31-53, 26-27.

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26. Ibid.

27. Ibid.

28. Donald, 16.

29. ~~(S)~~ NSA report, title: "Summary of Communications Reflection of USAF RB-50 Aircraft Downed in Peter the Great Bay Area, 29 July 1953," serial O/RU-A/R261-53, 14 August 1953 (TSC); Cryptologic Archival Holding Area; Accession No. 9357, box H11-0105-6, NSA. R261-53 was an updated reissue of R245-53, 31 July 1953.

30. ~~(S)~~ AFSS Roundup No. 147, 292230Z Jul 53 (TSC); Cryptologic Archival Holding Area; Accession No. 23915, box G18-0401-3, NSA.

31. Ibid.

32. ~~(S)~~ NSA report, title: "Communications Reflections of U.S. RB-50 Aircraft Downed in Peter the Great Bay Area, 29 July 1953," serial O/RU-A/R245-53, 31 July 1953 (TSC); Cryptologic Archival Holding Area; Accession No. 9357, box H11-0105-6, NSA.

33. Ibid.

34. Ibid.

35. Ibid.

36. (U) AFSS Roundup No. 149, 312140Z Jul 53 (TSC); Cryptologic Archival Holding Area; Accession No. 23915, box G18-0402-3, NSA.

37. Ibid.

38. (U) AFSS Roundup No. 151, 04/2120Z Aug 53 (TSC); Cryptologic Archival Holding Area; Accession No. 23915, box G18-0402-3, NSA.

39. Ibid.

40. ~~(S)~~ NSA, O/RU-A/R261-53.

41. ~~(S)~~ R245-53 called the information on air and sea rescue "collateral," but that term was corrected to "field" reports, that could also have contained collateral in NSA, Washington 25, D.C., report, title: "Amendment to Summary of Communications Reflections of USAF RB-50 Aircraft Downed in Peter the Great Bay Area, 29 July 1953," serial O/RU-A/R324-53, 2 September 1953 (TSC), (TSC); Cryptologic Archival Holding Area; Accession No. 9357, box H11-0105-6, NSA.

42. Ibid.

43. ~~(S)~~ NSA report, title: "Soviet Far Eastern Naval Traffic Information Summary, 26 July - 1 August 1953," serial: O/RU-N/R29-53, 31 August 1953 (TSC); Cryptologic Archival Holding Area; Accession No. 9456, box H11-0106-6, NSA.

44. ~~(S)~~ AFSCC, *Resumé*, 5.

45. Ibid., 5.

46. ~~(S)~~ AFSCC, *Resumé*, 5-6.

47. ~~(S)~~ 6920th Security Group Intsum for 8 September 1954, H/RU-A/R449-54, 10 September 1954 (TSC); Cryptologic Archival Holding Area; Accession No. 24099, box CBKM33, NSA.

48. (U) AFSS Weekly Digest 54-46, issued 17 November 1954 (TSC); CCH Crisis Collection, Series VIII, box 5a.

49. Ibid. ~~(S)~~ ~~(C)~~ The voice intercept was probably in the HF range (despite the fact that the Soviets had been in the process for over a year of converting their fighter force to VHF) because the Soviet 10th Air Army fighter unit, T5350D at Tofutsu, was not one of the units on Sakhalin Island or in the Kuril's chain to have yet converted, and it is doubtful whether the Soviets would have converted their MIG-15s to VHF in any case.

50. (U) 6920th Scty Gp electrical message, cite GCO-18046, Condition Xray One, 070530Z (TSC); CCH Collection, Series VIII, box 5a.

51. (U) 6920th Scty Gp electrical messages, Condition Xray Two through Eight (and Final), 070645Z to 080930Z Nov 1954 (TSC); CCH Crisis Collection, Series VIII, box 5a.

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52. ~~(FOUO)~~ An American member of "Task Force Russia" on the U.S.-Russian Joint Commission on POW/MIAs, during a visit to the CCH on 19 April 1993, stated that Russian representatives have confirmed that the RB-47 was shot down on 18 April 1955.

53. Marcelle S. Knaack. *Post-World War II Bombers, 1945-1973* (Washington, D.C: Office of Air Force History, USAF, 1988), 147-158.

54. "Missing Bomber Given Up," *New York Times*, 24 April 1955.

55. ~~(S)~~ NSA report, title: "Soviet Reaction to the Flight of US RB-47 Aircraft off the Coast of the Kamchatka Peninsula on 18 April 1955," serial: 3/O/RU-A/R88-55, 13 May 1955 (TSC). CCH Collection, Series VIII, box 3. Also (U) AFSCC, *Resumé*, 7. Also (U) USAFSS Weekly Digest No. 55-16, 20 April 1955 (TSC) C29-C32; Cryptologic Archival Holding Area; Accession No. 24412, box G18-0301-4, NSA.

56. ~~(S)~~ USA-34 Alert Xray Kamchatka Intelligence Nr. 3/Y/RU/R224-55 Nr 1 Declared by Com 3d RSM at 180630Z in accordance with NSA Circular 53-2, 180720Z (TSC); CCH Crisis Collection, Series VIII, box 3.

57. (U) Typed, undated timeline (TSC); CCH Crisis Collection, Series VIII, box 3.

58. (U) NSA-7642 memorandum to NSA-76, "Briefing the Director on Important Happenings" 27 April 1955 (TSC); CCH Collection, Series VIII, box 3.

59. (U) AFSCC, *Resumé*, 7.

60. ~~(S)~~ NSA, 3/O/RU-A/R88-55.

61. NSA reports, title: "COMINT Reflections of Soviet Tracking and Shoot-Down of U.S. Navy Neptune on 23 June 1955," serial: 3/O/RU-A/R107-55, 1 July 1955 (TSC); and title Supplement #1 to "COMINT Reflections of Soviet Tracking and Shoot-Down of U.S. Navy Neptune on 23 June 1955," serial: 3/O/RU-A/R118-55, 22 July 1955 (TSC). Source for seven crewmen injured is (U) T542 study titled *A Summary of Peacetime Hostile Air and Air Actions, 1949-1985*, March 1986 (S/CCO). All three reports are available in CCH Crisis Collection, Series VIII, box "0."

62. (U) AFSSOP SRS 2-60, *Review of Reactions to Reconnaissance Flights since 31 October 1958*, 1 December 1960 (TSC); CCH Crises Collection, Series VIII, box "0."

63. ~~(S)~~ USN-39 electrical reports, no titles, serial 3/Z/RUB/R264-56, 120051Z Sept 1956 (TSC), serial 3/Z/RUB/R266-56, 130041Z Sept 1956 (TSC) and; serial 3/Z/RUB/R268-56, 140555Z Sept 1956 (TSC); Cryptologic Archival Holding Area; Accession No. 21467, box H16-0302-4, NSA.

64. ~~(S)~~ USN-39 report, title: "Possible Reflection Soviet Submarine in Area of Current U.S. RB50 Search Operations Northern Sea of Japan," serial 3/Z/RUN/R273-56, 130857Z Sept 1956 (TSC); Cryptologic Archival Holding Area; Accession No. 21467, box H16-0302-4, NSA.

65. (U) On 27 June 1958, a USAF C-118 transport was shot down by Soviet fighters, also in Soviet Armenia. The aircraft crash landed, the crew survived and were freed shortly thereafter. This incident was not included because it is the opinion of the writer that it was not a reconnaissance mission per se.

66. (U) Rush, *A History of the USAFSS Airborne SIGINT Reconnaissance Program (ASRP), 1950-1977*.

67. ~~(S)~~ Russian Language Translation into English, NSA serial 3/O/RUK/T01-58 SIOUX, 3 October 1958 ~~(TSC)~~. And NSA report, titled: "Shoot-Down of a USAF C-130 by Soviet Aircraft on 2 September 1958," serial 3/O/RUK/R182-58 SIOUX, 15 October 1958 ~~(TSC)~~; CCH Crisis Collection, Series VIII, box 8a. The B% symbol is technical jargon for the qualifier "probably," commonly used in SIGINT reporting during that period.

68. ~~(S)~~ NSA, 3/O/RUK/R182-58 SIOUX.

69. ~~(S)~~ Several unsigned, undated working documents apparently prepared in support of Department of Defense and State Department follow-up actions; among which, one is titled: Historical Library Tape No. 1 C-130 Shootdown over Soviet Armenia ~~(S)~~; CCH Crisis Collection, Series VIII, box 8a.

70. Ibid.

71. Ibid.

72. English translation of articles in CCH Crisis Collection, Series VIII, box 8a.

73. ~~(S)~~ CIA electrical message from FI/D Fred Griffin to NSA Dr. Julia Ward, 22/1543Z September 1958 (TSC).

~~SECRET SPOKE~~

MAYBE YOU HAD TO BE THERE

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74. ~~(S)~~ Undated working paper, entitled: Chronology of NSA, GCHQ, State Department Actions on C-130 Incident ~~(TSC)~~; CCH Crisis Collection, Series VIII, box 8a.

75. ~~(S)~~ NSA, 3/O/RUK/T01-58 SIOUX.

76. ~~(S)~~ NSA, 3/O/RUK/R182-58 SIOUX.

77. ~~(S CCO)~~ One of the controversies was that GCHQ transcripts contained garbled references to (presumably parachute) jumps by the U.S. airmen that of course implied that there may have been survivors. NSA did not accept that version. Discussed in undated, unsigned paper: "Chronology of NSA, GCHQ, State Department Actions on C-130 Incident" that summarized events from 19 September 1958 through 5 February 1959; CCH Crisis Collection, Series VIII, box 8a.

78. (U) State Department Press Release, 5 February 1959 (U); CCH Crisis Collection, Series VIII, box 8a.

79. Ibid.

80. Rush, 12.

81. Brugioni, 12.

82. Burrows, 80, reports "some twenty deep penetrations" of Soviet airspace, Nigel West. *The Sigint Secrets: The Signals Intelligence War, 1900 to Today* (New York: William Morrow and Company, Inc, 1988), 268, claims the number was closer to 30. Ironically, Brugioni, who was closer to the U-2 program than either of them, and probably knew the answer precisely, doesn't say.

83. Brugioni, 43.

84. ~~(S)~~ NSA report, entitled: "Unidentified Intruder Aircraft Tracked into Interior of European USSR, 1 May 1960," serial 3/O/RUK/R19-60, 2 May 1960 (TSC); Cryptologic Archival Holding Area; Accession No. 42301, box H12-0701-2, NSA.

85. Ibid. There has been considerable controversy over what altitude Powers was flying at when his U-2 was hit. Unfortunately, without the actual tracking data, not available in the Archives, that might well shed light on any altitude changes over the course of the flight, the NSA report is of no help in resolving the issue.

86. Ibid.

87. The entire fascinating story of the shootdown from the survivors' point of view is told in William L. White's *The Little Toy Dog: The Story of the Two RB-47 Flyers, Captain John R. McKone and Captain Freeman B. Olmstead* (New York: E.P. Dutton & Company, 1962). Book is available from the Nimitz Library, U.S. Naval Academy, Annapolis, MD.

88. Ibid., 97.

89. Oleg Penkovskiy, *The Penkovskiy Papers* (New York: Doubleday, 1965), 369.

90. ~~(S CCO)~~ NSA report, title: "Summary of Soviet Reaction to USAF RB-47 Lost in the Barents Sea, 1 July 1960," serial 3/O/RUK/R33-60, 15 August 1960 (TSC). NSA actually published a spot report on 12 July, shortly after receiving the Third Party tapes and transcripts, and issued a supplement thereto on 21 July, but these were eventually canceled and replaced by R33-60; Cryptologic Archival Holding Area; Accession No. 42301, box H12-0701-2, NSA.

91. Ibid.

92. Ibid.

93. White, 43.

94. Quoted in White, 119-123.

95. Knaack, 403.

96. Ibid., 404.

97. Ibid., 418-419.

98. Ibid., 429-430.

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## CRYPTOLOGIC QUARTERLY

99. (U) NSA report, title: "Summary of the Shootdown of a USAF RB-66 by Soviet Tactical Air Force East Germany Fighters, 10 March 1964," serial 2/O/RUA/R26-64, 20 August 1964 (SC); CCH Crisis Collection, Series VIII, box 12.

100. Ibid.

101. Ibid.

102. Ibid.

103. ~~(S)~~ UKA-277B voice transcript, in English, of Berlin controller on Templehof Guard Channel, alerting an aircraft to its precarious situation, 10 March 1964, (C); CCH Crisis Collection, Series VIII, box 12.

104. ~~(S)~~ NSA electrical release, title: "Shootdown of U.S. Aircraft by Soviet Tactical Air Force East Germany Fighters," serial 2/O/RUK/15-64, 10 March 1964 (SC); Change 1 to R15-64, 11 March 1964 (SC); Change 2 to R15-64, 14 March 1964; and serial 2X/O/RUK/R1-64, 15 April 1964 (SC); CCH Crisis Collection, Series VIII, box 12.

105. ~~(S)~~ NSA, 2/O/RUA/R26-64.

106. Ibid.

107. Ibid.

108. DIRNSA message to JCS/JRC, subject: White Wolf Advisory Warning Plan, serial P04-184-64, 1 April 1964 (TSC); Cryptologic Archival Holding Area; Accession No. 43050, box H03-0504-1, NSA.

109. Correspondence and papers relating to the White Wolf Plan, 1961-1964 (TS-CCO); Cryptologic Archival Holding Area; Accession No. 43050, box H03-0504-1, NSA.

110. ~~(S-CCO)~~ A USAFSS Russian linguist/operator, stationed at a field station in Wakkanai, Japan, in the early 1950s, recalled an attempt, said to be once only, to implement a warning plan. The reconnaissance aircraft was tasked with photographing an alleged railroad causeway that the Soviets claimed to have built across the Tatar Straits between Sakhalin Island and the mainland. Wakkanai would try to warn the aircraft by transmitting stutter groups (for example, KKKK for "Soviet fighters are scrambled," RRRR for "fighters have been ordered to attack," etc.) if conditions warranted. Fighters were scrambled with orders to shoot, Wakkanai transmitted the alert, the bomber returned safely. Wakkanai found out later that the aircraft never did receive the alert, but operators aboard the aircraft had heard the fighters' communications and had warned the front-end crew. By the way, no causeway was found, as none existed. Personal memoir of James H. Carter, USAFSS retired, May 1991; CCH Crisis Collection, Series VIII, box "O."

111. Correspondence and papers relating to the White Wolf Plan, 1961-1964 (TS-CCO).

112. Operations Plan, UHF Air/Air Advisory Warning Plan, Serial No. 6-61, 31 May 1961 (TS); Cryptologic Archival Holding Area; Accession No. 15157, box CBRE67, NSA.

113. Correspondence and papers relating to the White Wolf Plan, 1961-1964 (TS-CCO).

114. ~~(SC)~~ A USAF RB-57 reconnaissance aircraft went down, with the loss of two crewmen, during a mission over the Black Sea on 14 December 1965. There was extensive SIGINT on the incident, both HF Morse air surveillance tracking and VHF tactical air-ground voice communications. The Soviets tracked not only the RB-57 but also a U.S. Navy reconnaissance aircraft and a USAF ACRP aircraft, all generally at the same time and generally in the same area. Two Soviet fighters were detected in defensive patrols, but SIGINT showed that the closest approach of the fighters to the RB-57 was 90 kilometers, with no hostile intent demonstrated. NSA concluded that despite "analysis of all available SIGINT data," there was "no indication of Soviet involvement in the loss of the U.S. Reconnaissance aircraft (RB-57F)." NSA report, title: "Summary of SIGINT Reflections of the Loss of a U.S. Reconnaissance Aircraft in the Black Sea, 14 December 1965," serial: 2/O/RUK/R54-65, 20 December 1965 (SC); Cryptologic Archival Holding Area; box 31729, temporary location A01-0104-2, NSA.

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