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SUMMARY

- PURPOSE:** To provide security and policy review of the attached document prior to public release.
- BACKGROUND:** Dr John Farquhar, Associate Professor, DFMI
Journal article submission of "Arctic Linchpin: The Polar Concept in American Air Atomic Strategy, 1946-1948"
Abstract: Dr Farquhar's article outlines the development of "the polar concept" of operations and the associated development of polar navigation as well as overcoming the unique challenges of severe cold weather operations. There are no statements making any judgments about Air Force or DOD policy and thus, there should be no objections regarding public release of Dr Farquhar's historical paper.
Release Information: Dr Farquhar will submit the review to an appropriate military history journal for publication, date and status TBD.
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- RECOMMENDATION:** Sign Approve/Review blocks above indicating document is suitable for public release. Suitability is based solely on the document being unclassified, not jeopardizing DOD interests, nor inaccurately portraying official policy.

[Signature]
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Arctic Linchpin:

The Polar Concept in American Air Atomic Strategy, 1946-1948

By

John T. Farquhar

With the Japanese surrender on the deck of the USS *Missouri* on August 14, 1945, American civil and military leaders faced a bewildering array of problems: unaccustomed world leadership, a potential renewed economic depression, demobilization, structuring postwar national defense, the breakup of European colonialism, and signs of an impending Cold War. Among the postwar strategic visions, American air leaders advanced an “air atomic strategy” based on perceived lessons from World War II and the terrible potential of the atomic bomb, viewed by many as a weapon that revolutionized warfare. As Cold War hostilities increased, American war planning adopted strategic air warfare as a primary component. Yet, the problem of transforming a strategic concept into operational and tactical realities remained. At the heart of the issue in geographic, strategic, and conceptual terms emerged the American territory of Alaska and what became known as the “Polar Concept,” the idea that the shortest, most direct, and least defended route between US bases and Soviet targets involved flying great circle routes over the Arctic and North Pole. By examining Air Force efforts in the 1946-1948 formative period to pioneer Arctic flying, map the vast northern reaches, and plot possible transpolar bomber routes, Alaska emerged as the linchpin of American air atomic strategy. The role of arctic aerial reconnaissance during the early Cold War also served as a case study of military innovation, problem solving, and the limits of Air Force strategic theory.

Awareness of Alaska’s strategic importance first appeared with interwar thinking about the growing threat of Japan. Most notable, Brigadier General William “Billy” Mitchell called attention to a great circle route from the United States to Alaska and the Aleutian Islands, to Kamchatka, the Kurile Islands, and to Japan.¹ In a manuscript, “American, Air Power, and the Pacific,” Mitchell claimed Alaska as the key to a strategic bombing campaign against vulnerable Japanese cities in an inevitable and imminent war.² Likewise, seizing Alaskan bases offered Japan an attack avenue to the United States as dramatized by World War II’s significant, but unheralded, Aleutian campaign. Before hostilities, the US Army and Navy recognized Alaska’s geographic significance and resource potential and constructed military, naval, and air bases at Adak, Anchorage, Fairbanks, and other locations. Fairbanks, in particular, served as an experimental cold weather station where winter temperatures dropped to as low as -72° F.³

Postwar military base planning varied over the relative importance of Alaska to US national defense concepts. In his book, *Circling the Earth: United States Plans for a Postwar Overseas Military Base System, 1942-1948*, Elliott Converse depicted a conceptual battle between visions of the United States as a regional, or hemispheric, power and the US as a global force. In the June 1944 revision of the Army Air Force’s Initial Postwar Air Force Plan (IPWAF), Col R. C. Moffat, Chief of the Post War Division, argued that even though Alaska is close to eastern Siberia, “it is far distant from the sources of Soviet power.” The IPWAF called

¹ Alfred F. Hurley, *Billy Mitchell: Crusader for Air Power* (Bloomington: Indiana University Press, 1975), 52, 87.

² *Ibid.*, 118.

³ William M. Franklin, “Alaska, Outpost of American Defense,” *Foreign Affairs* 19, no. 1 (October 1940): 248.

for outposts in Alaska “purposely not strong enough to constitute a dagger pointed at the Soviet heart or at Europe, but do provide routes for reinforcement . . . [and] constitute a deterrent to offensive action aimed at the western hemisphere.”⁴ Along the same lines, a December 1945 Joint Chiefs of Staff (JCS) document, “An Outline Plan for the Military Development of Alaska,” stated:

. . . the probability of trouble developing in the Alaskan Area as a result of conflict between U.S. and USSR policies is fairly remote. The Soviet capability to launch a major operation against the Alaskan Area in the next five years is estimated to be almost nil; . . . it does not appear necessary to station air forces or ground force combat troops in the Alaskan Area except for training, acclimatization, experimental purposes, limited reconnaissance and surveillance, and for limited local defense of selected bases.⁵

In stark contrast, prominent airmen embraced “the Polar Concept” as central to their postwar vision. In a February 1946 *National Geographic* magazine article, “Air Power for Peace,” General of the Army H[enry] H. Arnold argued, “A surprise attack could readily come from across the roof of the world unless we are in possession of adequate airbases outflanking such a route of approach.”⁶ To further illustrate the point, the *National Geographic* issue featured a polar projection map of the Northern Hemisphere with air distances between major cities based on trans-polar routes. Arnold continued:

Any danger to this country must come from north of the 30th parallel of north latitude. South of that line there are no formidable unfriendly powers. . . . With the 5,000-mile-radius bombers of the near future, our Air Forces could cover practically all danger spots in Europe or Asia from bases which we now occupy. Conversely, similar planes of the enemy could bring our principal industrial centers under direct bomber attack. . . . America and Asia are neighbors nearer by hundreds of miles by the polar route.⁷

The Polar Concept meshed with the “air atomic” or strategic air warfare vision strongly advocated by senior Air Force leaders. In some ways, General Arnold’s *National Geographic* article served as a manifesto of their beliefs:

With present equipment, an enemy air power can, without warning, pass over all formerly visualized barriers or “lines of defense” and can deliver devastating blows at our population centers and our industrial, economic, or government heart even before our surface forces can be employed. . . . The application of atomic energy to war has made air

⁴ Drafted in October 1943, the IPWAF was one of the first postwar basing plans and written before Cold War tensions. Elliott V. Converse, *Circling the Earth: United States Plans for a Postwar Overseas Military Base System, 1942-1948* (Maxwell Air Force Base, AL: Air University Press, 2005), 51, 53-54.

⁵ JCS 1295/2, Appendix B: “An Outline Plan for the Military Development of Alaska,” 21 Dec 1945, File: CCS 660.2 Alaska, 3-23-45, Record Group (RG) 218, National Archives, Washington, DC (NA).

⁶ General of the Army H [enry] H. Arnold, “Air Power for Peace,” *National Geographic* 89, no. 2(February 1946): 170.

⁷ *Ibid.*, 160, 170.

power all-important. Air power provides not only the best present means of striking the enemy with atomic bombs, but also the best available defense against them. . . . The atomic weapon thus makes offensive and defensive air power, in a state of immediate readiness, the primary requisite of national survival. . . .⁸

In March 21, 1946, the Army Air Force sought to operationalize strategic air warfare by creating the Strategic Air Command (SAC). Its mission was straight forward:

The Strategic Air Command will be prepared to conduct long-range offensive operations in any part of the world either independently or in cooperation with land and Naval forces; to conduct maximum range reconnaissance over land or sea either independently or in cooperation with land and Naval forces; to provide combat units capable of intense and sustained combat operations employing the latest and most advanced weapons; to train units and personnel for the maintenance of the Strategic Forces in all parts of the world; to perform such special missions as the Commanding General, Army Air Forces may direct.⁹

The creation of SAC institutionalized the Air Force's conviction that strategic bombing played a vital, if not decisive, role in winning World War II.

As strategic air campaigns in World War II showed, there was a vast gulf between the vision of strategic air warfare and the reality of Europe's Combined Bomber Offensive and the strategic bombing campaign against Japan. Similarly, vast uncharted miles of polar ice cap, freezing temperatures, magnetic anomalies that jeopardized navigation, unknown winds, and other significant, practical obstacles presented significant challenges to the Polar Concept as described in postwar air atomic strategy. Although a handful of daring explorers flew across Arctic regions in the 1920s and 1930s, no practical means of arctic air travel existed. For example, Carl Ben Eielson earned fame as the first man to fly across the polar ice cap in a flight from Alaska to Spitzbergen Island, Greenland in 1928; but, a year later, he and his mechanic lost their lives while flying in a blizzard.¹⁰

In an attempt to bridge the operational gaps, the War Department General Staff initiated a top secret Project No. 5, codenamed Operation FLOODLIGHT, to conduct aerial reconnaissance of the Arctic. Army Chief of Staff General Dwight D. Eisenhower approved the concept, and General Carl A. Spaatz as Commanding General, US Army Air Forces, directed the new Strategic Air Command to lead the effort. On June 14, 1946, SAC ordered the deployment of the

⁸ Ibid., 137, 139, 153.

⁹ Carl Spaatz, Commanding General, Army Air Forces, to Commanding General, Strategic Air Command, Subject: Interim Mission, 12 March 1946, in *Strategic Air Command Statistical Summary*, HQ Strategic Air Command, Vol. 1, No. 1 (1 June 1946), File: 416.01, 21 March-31 December 1946, vol. 4, Air Force Historical Research Agency (AFHRA), Maxwell Air Force Base, AL; J. C. Hopkins and Sheldon A. Goldberg, *The Development of the Strategic Air Command 1946-1986 (The Fortieth Anniversary History)* (Offutt Air Force Base, NE: Office of the Historian, Headquarters Strategic Air Command, 1986), 2.

¹⁰ Carl Ben Eielson, <http://explorenorth.com/library/aa022800a.htm> (accessed 1 Jul 2014).

46th Reconnaissance Squadron to Ladd Field, near Fairbanks, Alaska as part of Project NANOOK.¹¹

From August 1946 until October 1947, the 46th Reconnaissance Squadron, under the command of Major Maynard E. White, tested the feasibility of trans-polar operations and arctic flying. In compliance with Project NANOOK, 46th crews conducted visual and radar photography of the arctic ice pack, Alaska, and the Canadian Archipelago. Part of their reconnaissance efforts included a search for previously undiscovered land masses, accumulate meteorological data, record magnetic variation, and explore potential air routes.¹² In the first month of operations in August 1946, the 46th flew thirty photo missions, yet even before onset of full winter, icing and other weather conditions hampered operations. The 46th Reconnaissance Squadron flew F-13A reconnaissance aircraft (Boeing B-29s modified for aerial photography) and discovered that cameras installed in unpressurized areas froze and were impossible to maintain.¹³ These early flights encountered ice that formed on propeller hubs that would break off and damage the aircraft's skin. The cold also required oil-lubricant changes and eventually thirty-six additional modifications to the planes.¹⁴ Making matters worse, December 1946 marked one of the coldest months on record, including a span of thirty days with temperatures never higher than -50° F. In an assessment of the arctic flying efforts, Mr. Carroll L. Zimmerman, Strategic Air Command's Chief of Operations Analysis concluded:

One of the large lessons learned in this winter's operations in Alaska is that AAF knows how to operate aircraft in flight at any temperature, but it does not know how to preserve and maintain aircraft on the ground at extreme temperatures with limited facilities. . . . Only when winter with its -50° ground temperatures arrived were the difficulties peculiar to cold weather operations experienced.¹⁵

¹¹ Although the exact relationship of Projects NANOOK and FLOODLIGHT are unclear in the documentary record with the terms used almost interchangeably, it appears that Operation FLOODLIGHT (Project No. 5) was the classified aerial photographic component of Project NANOOK, the overall arctic reconnaissance mission. Ladd Field is now Fort Wainwright. *History Strategic Air Command 1948*. Vol. I: *Narrative*, 248-249; Fred John Wack, *Secret Explorers: Saga of the 46th/72nd Reconnaissance Squadrons* (Turlock, CA: Seeger's Printing, 1992), 1; Routing and Record sheet (R&R), Air Intelligence Requirements Division, Reconnaissance Branch, Directorate of Intelligence (AFOIR-RC) to Chief of Staff General Intelligence Division (CSGID), subject: Photography of Floodlight (Project No. 5), 18 Nov 48, File: 2-5373, Folder: 2-5600- to 2-5699, Box 43, Entry 214, RG 341, NA.

¹² Early Strategic Air Command doctrine recognized the advantage of bomber operations against fighter defenses flying at night or in bad weather; hence, radar scope photography, a built-in camera taking pictures of the navigator's radar scope, would be included in target folders to assist bomber navigators in identifying targets and key geographical features en route. *History Strategic Air Command 1948*, Vol. I: *Narrative*, 248; Wack, *Secret Explorers*, 1.

¹³ Wack, *Secret Explorers*, 3, 21; Ken White, *World in Peril: The Origin, Mission & Scientific Findings of the 46th/72nd Reconnaissance Squadron* (Elkhart, IN: K. W. White & Associates, 1992), 33-35, 73-84.

¹⁴ White, *World in Peril*, 13; Wack, *Secret Explorers*, 3, 4, 7.

¹⁵ R&R, Headquarters Strategic Air Command, "Trip to Alaska," Mr. Carroll L. Zimmerman, Chief, Operations Analysis, Exhibit 112, *The Strategic Air Command 1947*, Vol. 4: *Supporting Data (Operations)*, File: 416.01 v.4 1947, AFHRA.

Nevertheless, drawing upon the ingenuity and fortitude of the maintenance and support personnel and the courage of aircrews braving unexplored, uncharted, featureless areas with little chance of air-sea rescue, the 46th eventually conquered the elements and definitely earned its later accolades for these pioneering efforts.

Overcoming the unique challenges of polar navigation through the development of grid navigation procedures marked a significant advancement in making the Polar Concept a reality. As suggested earlier, early arctic flights were a hit-or-miss affair due to the unreliability of magnetic compasses near the magnetic North Pole. Before their deployment, none of the 46th's 35 navigators had ever been north of the 50th parallel or had attempted polar navigation techniques. Hence, in the words of 1st Lt Wayland W. Williams, "Know-how on the subject was accumulated and dispensed as rapidly and thoroughly as possible."¹⁶ Project NANOOK flights utilized electronic, gyro-stabilized compasses that essentially created an artificial "North" not dependent on the earth's magnetic field. This grid navigation technique had been developed by British, Canadian, and American navigators earlier, but had remained largely theoretical until Project NANOOK. Navigators used celestial navigation to determine True North and then adjusted the electronic, gyro-stabilized compass for precession and other technical errors. Additionally, the crews measured magnetic variation that combined with aerial photography to create usable flying charts.¹⁷

As aerial reconnaissance advanced in 1946 and 1947, Project NANOOK accomplished the four tasks associated with Operation FLOODLIGHT and added two related photo-mapping projects: Project 14 and Operation EARDRUM. Sorties mapped Area "A" (between 160 and 180 degrees East Longitude and 73 and 77 degrees North Latitude), Area "B" (north and east of A), Area "C" (the route between Alaska and Iceland also known as Operation POLARIS), and Area "D" (the area between 85 degrees North Latitude and the North Pole).¹⁸ In late 1946, Operation POLARIS increased in scope to include photography on the northern Canadian Archipelago. Aircrews from the Royal Canadian Air Force flew with the 46th Reconnaissance Squadron for these missions.¹⁹ Along the same lines, during the summer of 1947, SAC added Operation EARDRUM, the tri-metrogon photomapping of Greenland.²⁰

¹⁶ 1st Lt Wayland W. Williams, 46th Reconnaissance Squadron (VLR) Photographic, "A Summary of Polar Navigation," File: USSTAF-Historical Section-Histories, Box 291, Carl A. Spaatz Papers, Library of Congress.

¹⁷ 1st Lt. David J. Haney, "Difference Between Polar and Low-Latitude Navigation," in White, *World in Peril*, 53-55; Wack, *Secret Explorers*, 7; For an in-depth look at the problems of polar navigation, see chapter 17 of Air Force Manual 51-40, *Air Navigation*, Departments of the Air Force and Navy (Washington: Government Printing Office, 1983).

¹⁸ Historical Section, Strategic Air Command, *The Strategic Air Command 1947*, Vol. 1: *Narrative*, 248-249, File: 416.01, v.1, 1947, AFHRA.

¹⁹ Wack, *Secret Explorers*, 16.

²⁰ Tri-metrogon photography involved three cameras, one vertical and two mounted at oblique angles to provide a horizon-to-horizon photographic mosaic. Historical Section, Strategic Air Command, *The Strategic Air Command 1947*, Vol. 1: *Narrative*, 140-146, File: 416.01, v.1, 1947, AFHRA; Col. Kenneth P. Bergquist, Deputy Assistant

Exploring a feasible air route between Alaska and Iceland addressed a major postwar issue linked to the Polar Concept. During World War II, President Franklin D. Roosevelt and others viewed commercial aviation as a key to future economic prosperity. Regular air travel between Alaska and the continental United States would reduce Alaska's isolation and in turn, commercial aviation between Alaska and points in Europe and Asia promised trade, travel, and profit. Civil and military leaders looked to Pan American Airline's prewar success in Latin America. Hence, Operation POLARIS's creation of a viable Alaska-Iceland air route foreshadowed greater economic development.²¹ In strategic terms, some analysts viewed the establishment of air bases akin to Alfred Thayer Mahan's advocacy of coaling stations in the Age of Steam.²² Thus, Operations POLARIS and EARDRUM (exploring air routes between Alaska and Greenland respectively) fit into the economic development dimension of polar flying operations.

Paralleling the rise of Cold War tensions in 1947, Alaskan-based aerial reconnaissance increasingly focused on assessing Soviet military capabilities. In February 1947, the Chief of Naval Operations, Fleet Admiral Chester W. Nimitz requested a formal study of "Russian air capabilities for defense against strategic bombardment within the next five years."²³ From a bureaucratic perspective, the study represented ammunition in the inter-service battle for declining defense budgets, with the US Navy seeking justification for the 65,000-ton supercarrier, USS *United States*, capable of launching nuclear-armed bombers, and independence-minded Air Force leaders viewing strategic air warfare as the primary mission for a new service.²⁴ At the strategic policy level, the Soviet capabilities request underscored the dearth of reliable intelligence needed for a strategic air campaign. Specifically, planners needed information on Soviet exploitation of German rocket and jet technology, indigenous Soviet aviation technology, radar and antiaircraft capabilities and coverage, air defense and fighter bases, communications, and the other planning details.²⁵

Building on electronic intelligence, or "Radar Countermeasures" (RCM) missions of World War II, Alaskan-based electronic reconnaissance, known as "ferret," missions sought information on Soviet radars in Siberia and the Arctic. In January 1947, technicians at Wright Field (later Wright-Patterson Air Force Base) modified a Boeing B-29 Tail number 45-21812 by adding specialized radar detection and analysis equipment. Known initially as "B-29 812" or

Chief of Air Staff, to Commanding General, Strategic Air Command, subject: Operation EARDRUM, 3 Mar 1947, 113, *The Strategic Air Command 1947*, Vol. 4: *Supporting Documents*, File: 416.01, v.4, 1947, AFHRA.

²¹ Converse, *Circling*, 35, 39-40, 75.

²² *Ibid.*, 76-77.

²³ Memo for General Spaatz from Major General George C. McDonald, Assistant Chief of Air Staff-2, Subject: Air Intelligence Division (ONI) Study No. 156, 10 Feb 47, File: ABI- 744, Folder: ABI 700 to 799, Box 38, Entry 214, RG 341, NA.

²⁴ Robert Frank Futrell, *Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force*, Vol. 1: 1907-1960 (Maxwell Air Force Base, AL: Air University Press, 1989), 197-198.

²⁵ Headquarters AAF Air Intelligence Report, No. 100-146/4-34, "Operational Capabilities of U.S.S.R. in Certain Areas," 6 June 1947, Folder: 2-200 to 2-299 Jul 47-Aug 47, Box 39, Entry 214, RG 341, NA.

“the ELINT B-29,” and nicknamed “Sitting Duck” by its crew, the ferret aircraft deployed to Ladd Field on May 21, 1947 under command of pilot Captain Landon Tanner, SAC project officer Captain Les Manbeck, and senior Electronic Warfare Officer (EWO or “Raven”) Captain Robert Perry.²⁶ After arctic and polar flying training, including a flight to the North Pole on June 5th, the “Sitting Duck” flew eleven electronic reconnaissance missions. Interestingly, Captain Perry reported receiving rather vague guidance from higher headquarters: “Nobody gave me a briefing on what was where or what they wanted or anything. They just said, ‘Go and see what radars are there.’ That was all.”²⁷ By mid-August 1947, the ELINT B-29 explored the northern Siberian coast, the Bering Strait, the southern Siberian coast along the Kamchatka peninsula. The six Raven crew members identified a small number of Soviet RUS-2 radars along the coast of the Soviet Far East, but no signals in the Soviet arctic. Warned to stay fifteen miles from Soviet territory, on at least one occasion the crew overflew the Soviet landmass:

On one of those missions we were supposed to make a little dip into Anadyr Bay, which is a big bay maybe 120 miles wide and 120 miles deep . . . we were just supposed to make a little ‘V’ into it. All of a sudden I looked at the radar and I called up Kelly (radar navigator). I said, “Kelly we’re over land!” He says, “I know it.” . . . Flanagan (1st navigator) said, “Well, we’ve hit a reverse jet stream and we’re trying to get out. It’s carried us inland about 50 miles and we’re making about 20 knots ground speed trying to get out.” Actually, there was nothing there . . . we found some airfields along the bay. We took some pictures of them, but there was nothing on them.²⁸

Upon completion of approximately 150 flying hours associated with the ferret’s reconnaissance, the “Sitting Duck” and crew returned to Andrews Army Air Field for debriefing.

The success of the ELINT B-29 resulted in the newly established United States Air Force (September 18, 1947) creating additional long-range ferret aircraft now designated as RB-29s. In addition, the new USAF shifted control of arctic reconnaissance from SAC to the Alaskan Air Command (AAC) and the 46th Reconnaissance Squadron was renumbered as the 72nd Reconnaissance Squadron, still commanded by Major Maynard White. Operations NANOOK,

²⁶ The ferret aircraft was equipped with APH-4 and APH-5 radar receivers, an APA-17 direction finder, APA-11 signal analyzers, and ARR-5 and ARR-7 radio receivers with wire recording equipment. During World War II, electronic warfare officers picked up the nickname of “Crows,” while electronic reconnaissance EWOs became known as “Ravens.” The Association of Old Crows, a professional organization supporting former and current electronic warfare officers headquartered in Alexandria, Virginia, maintains an archive of interviews of veterans of early ferret missions from World War II and the Cold War. Files are organized by number and last name of individual. File: F. Voltaggio, pp. 8-12; File 31: Col R. Perry, pp. 9-10; File 11: Col Joe Wack, pp. 1-4; Frank Voltaggio, Jr., “Out in the Cold: Early ELINT Activities of the Strategic Air Command,” (unpublished), Association of Old Crows archive (AOC), Alexandria, VA.

²⁷ File 31: Col R. Perry, 9; File: F. Voltaggio, 11, AOC.

²⁸ File 31: Col R. Perry, 10; File: F. Voltaggio, 12-13, AOC.

POLARIS, and EARDRUM continued their aerial photography and photomapping assignments until completion near the end of 1948.²⁹

Worries over possible atomic strikes by “Soviet B-29s” flying one-way missions over polar regions focused Alaskan-based reconnaissance on the potential of Soviet air bases on Siberia’s Chukotski Peninsula.³⁰ Lying directly opposite Alaska’s Seward Peninsula, early Cold War Air Force intelligence estimates determined that the Chukotski Peninsula was the most likely area for Soviet long-range bomber bases. The Air Force Directorate of Intelligence assessed the Soviets capable of producing reverse-engineered B-29 type bombers in April 1946 and called attention to 54 sightings of Soviet B-29 type aircraft between October 1946 and November 1947.³¹ In addition, one memorandum estimated 200 Soviet aircraft opposite Alaska, including 100 fighters, 50 attack, and 50 light bombers. It cited one paved airfield of 6,000-foot length and four other unpaved airfields of 4,500 feet, capable of extension to 6,000 feet. The analysis suggested: “From these fields it is estimated that Russia could operate 300 bombers or sufficient troop carrier aircraft to lift 7,000 paratroops to a radius of 700 nautical miles, (the distance to Fairbanks).”³² Despite the dire intelligence picture, Air Force and State Department officials fully understood the political consequences of aerial reconnaissance of the Chukotski Peninsula: “Overflying sovereign Soviet territory to procure vertical photographic coverage is certain to be construed by the U.S.S.R. as a warlike act.”³³

The problem of Soviet B-29s flown from Chukotski Peninsula airfields illustrated the tactical, operational, and strategic challenges faced by the Alaskan Air Command. The issue pitted a gap in strategic intelligence, viable information on the perceived Soviet threat, against significant diplomatic and political consequences associated with the photographic aerial reconnaissance needed to fill the void. At an operation level, two additional Top Secret projects attempted to address the Chukotski concerns, yet balance negative political consequences. In Project 20, the 72nd Reconnaissance Squadron flew semi-monthly missions from Point Barrow to the tip of the Aleutian Chain by way of the Bering Strait. Intended for intelligence and surveillance, Headquarters USAF Air Intelligence directed the aircraft to photograph any objects

²⁹ Staff Summary Sheet, Subject: Photography of Floodlight (Project No. 5), 18 Nov 1948, File: 2-5373, Folder: 2-5600 to 2-5699, Box 43, Entry 214, RG 341, NA.

³⁰ Although often referred to as the Chukchi Peninsula (or Chukota Peninsula) today, most contemporary documents referred to the landmass approximately N 66° W 172° as the Chukotski Peninsula and I will use this transliteration.

³¹ Memorandum from Colonel Robert Taylor, Chief, Collection Branch, Air Intelligence Requirements Division, Directorate of Intelligence, for Colonel Hugh D. Wallace, Subject: Distribution of Studies, 8 March 1948, File: 2-8389, Folder: 2-8300 to 2-8399, Box 45, Entry 214, RG 341, NA.

³² Evidently the analysts had no first-hand knowledge of the difficulties in cold-weather flying encountered by the 46th/72nd Reconnaissance Squadron to tone down these extravagant claims. Memorandum for the Secretary of the Air Force from General Carl Spaatz, Chief of Staff, United States Air Force, Subject: Some Reports of Soviet Activities in Alaska and Adjacent Thereto, 25 March 1948, File: 2-1193, Folder: 2-1100 to 2-1199, Box 40, Entry 214, RG 341, NA.

³³ Staff Summary Sheet, Subject: Photographic Coverage – Chukotski Peninsula Airfields, n. d., George C. McDonald, Director of Intelligence, to Director of Plans and Operations, 23 Apr 1948, File: 2-1432, Folder: 2-1400 to 2-1499, Box 41, Entry 214, RG 341, NA.

or unusual activity.³⁴ Although similar in intent, Project 23 focused primarily on ferret operations, or electronic intelligence, against Soviet radar. Beginning in October 1947 and featuring two aircraft each mission, Project 23 covered the north and south coasts of Siberia adjacent to Alaska. One aircraft flew at high altitude “directly over the coastline” while a second aircraft flew parallel several miles out to sea.

What did “directly over the coastline” mean? An August 1947 Air Staff memorandum established guidance that “aircraft must remain at least 15 miles from non-United States territory.”³⁵ Because the 72nd Reconnaissance Squadron RB-29s were equipped with short focal-length K-20 cameras with limited photographic range, the Alaskan Air Command interpreted the territorial restriction for Project 23 missions to the international limit of three miles. Unfortunately, a December 1947 memorandum for the Chief, Air Intelligence Requirements Division noted that the missions thus far had resulted in oblique photos of very poor quality.³⁶ “Oblique coverage made up to now by short focal length cameras in aircraft flying some twelve miles off the Chukotski shore line has not resulted in significant intelligence.”³⁷ Moreover, a Project 23 mission flown on December 22, 1947 closed to three nautical miles and still failed to procure useable results.³⁸ Like earlier challenges of cold weather flying and grid navigation, arctic aerial reconnaissance faced a significant tactical problem to achieve the operational mission. Additionally, the tactical problem of inadequate aerial photos using existing cameras and reconnaissance procedures foreshadowed significant strategic and diplomatic issues of the following year. Significantly, attention devoted to the tactical and operational problems of making the Polar Concept work blinded air staff thinkers from questioning the assumptions behind strategic air warfare.

On January 8, 1948, the Soviets emphasized the political risk of aerial reconnaissance by issuing a formal diplomatic protest for a December 23, 1947 mission:

The Embassy of the Union of Soviet Socialist Republics presents compliments to the Department of State and has the honor to communicate the following:

On December 23, 1947 at 14 hours and 15 minutes an American airplane violated the Soviet frontier in the region of Cape Chukotsk, flying for about seven miles along the coast of the Chukotsk Peninsula at a distance two miles from the shore.

³⁴ Memorandum for Chief, Air Intelligence Requirements Division from Major Carl M. Green, Reconnaissance Branch, Air Intelligence Requirements Division, Directorate of Intelligence, 11 Dec 47, File: 2-682, Folder: 2-600 to 2-699, Box 40, Entry 214, RG 341, NA.

³⁵ R&R, Re issuance of instructions regarding operation of two 46th Recon Sqd A/C now being fitted w/RCM equipment, 20 Aug 1947, File: 2-296, Folder: 2-200 to 2-29 Jul 47-Aug 47, Box 39, Entry 214, RG 341, NA.

³⁶ Ibid.

³⁷ R&R, Photographic Coverage, Chukotski Peninsula Airfields, Major General George McDonald to Director of Plans and Operations, 23 April 1948, File: 2-1431, Folder: 2-1400-2-1499, Entry 214, RG 341, NA.

³⁸ This refers to Mission Number 7M263A flown by the 72nd Reconnaissance Squadron. Staff Summary Sheet, Subject: Photographic Coverage—Chukotski Peninsula, n. d., File: 2-1378, Folder: 2-1300 to 2-1399 (1948), Box 41, Entry 214, RG 341, NA.

In communicating the foregoing, the Embassy, upon instructions from the Soviet Government, requests that the case under reference of a violation of the Soviet frontier by an American airplane be investigated and that measures be taken not to permit such violations in the future.³⁹

The US State Department sought a Headquarters US Air Force investigation of the incident, which revealed that the aircraft was a 72nd Reconnaissance Squadron RB-29 flying a Project 23 mission. The official US response acknowledged that an American aircraft was in the vicinity, but declared, “No land belonging to the Soviets was overflown and it cannot be determined that the Soviet frontier was violated. There are indications that the pilot of the aircraft may not have complied with the Department of State’s limitation, . . . of 12 miles from the territory other than the United States.”⁴⁰ Although the incident did not escalate into a major diplomatic crisis, it communicated the significant consequences of arctic probes of Soviet air defenses. The investigation of the Soviet protest also revealed gaps between Headquarters US Air Force guidance influenced by the Department of State, Alaskan Air Command’s directives regarding closest point of approach to Soviet territory, and actual instructions issued to 72nd Reconnaissance Squadron air crew.⁴¹

The Berlin Crisis of 1948 dramatized the danger of inadequate strategic intelligence and paralleled the political tensions over arctic aerial reconnaissance. Within weeks of a Communist coup in Czechoslovakia, the Soviets moved to close highway, rail, and river access to Berlin on April 1, 1948, ostensibly for “technical difficulties.” This act cascaded into a major diplomatic crisis, the Berlin Airlift, and increased worries over a potential atomic war.⁴² President Harry S.

³⁹ The international dateline explains the difference in dates. The December 22nd Project 23 flight (Alaska time) would be December 23rd in the Soviet Far East. Embassy of Union of Soviet Socialist Republics No. 261, January 5, 1948, attachment 1 to Francis B. Stevens, Acting Chief, Division of Eastern European Affairs, Department of State, Subject: Alleged Violation of Soviet Frontier, File: 2-934, Folder: 2-900 to 2-999 Feb 48, Box 40, Entry 214, RG 341, NA.

⁴⁰ Brigadier General F. J. Timberlake, Jr., Chief, Operations Division, Directorate of Plans and Operations to Mr. Francis B. Stevens, Acting Chief, Division of Eastern and European Affairs, Department of State, 2 Mar 48, File: 2-934, Folder: 2-900 to 2-999 Feb 48, Box 40, Entry 214, RG 341, NA.

⁴¹ A series of staff studies initiated by the incident revealed that the Headquarters US Air Force Staff in Washington thought the Alaskan missions were following the State Department guidelines of a twelve-mile restriction from Soviet territory, but that for this mission the AAC authorized the internationally recognized territorial waters of three nautical miles. The documents do not capture the specific instructions to the aircrews. The mixed guidance is revealed by comparing Memorandum for Record, Subject: To reply to Department of State request for investigation of Soviet allegation of American airplane violation of Soviet frontier, n. d. [16 Feb 48], File: 2-934, Folder: 2-900 to 2-999 Feb 48, Box 40, Entry 214, RG 341, NA with Staff Summary Sheet, Subject: To reply to memorandum sent by Mr. Symington to General Spaatz, n. d. [5 Apr 48], File: 2-1378, Folder: 2-1300 to 2-1399 (1948), Box 41, Entry 214, RG 341, NA.

⁴² On March 31, 1948, General Dratvin, the Soviet deputy military governor of Berlin, announced that the Soviets would check all US personnel passing through their zone for identification and inspect all freight shipments. The Allies objected since they had received assurance of free access to Berlin at the end of the war. Harry S. Truman, *Memoirs by Harry S. Truman* (Garden City, NY: Doubleday & Co., 1956) vol. 2: *Years of Trial and Hope*, 122; Warren A. Trest and George M. Watson, Jr., “Framing Air Force Missions,” in *Winged Shield, Winged Sword: A History of the United States Air Force*, Vol. 1: *1907-1950*, gen. ed. Bernard C. Nalty (Washington: Air Force History and Museums Program, 1997), 426-427; and Roger G. Miller, “Freedom’s Eagles: The Berlin Airlift, 1948-1949,” *Air Power History* 45, no. 3(Fall 1998): 8.

Truman viewed the crisis and blockade as a test of Western resolve and patience.⁴³ Fortunately, the Berlin Airlift's successful application of non-kinetic airpower allowed time for the political crisis to diffuse, but increased Cold War tensions focused attention on both the offensive and defensive assumptions of strategic air warfare and the Polar Concept. Trans-polar routes served as an offensive path for American bombers for future atomic war, but they also suggested the possibility of a surprise Soviet attack, an atomic Pearl Harbor with no-notice or means of defense.

Making matters worse from an operational and tactical viewpoint, tensions from the Berlin Crisis prompted the US State Department to limit aerial reconnaissance missions to a 40-mile buffer from Soviet territory effective May 14, 1948.⁴⁴ Senior officials faced a dilemma: determining the suitability of Chukotski airfields for Soviet B-29s constituted a top priority for strategic intelligence and military planners, yet the Berlin Crisis sparked tensions and a genuine war scare. Because of the tactical limitations of existing cameras, the Air Force Directorate of Intelligence and Alaskan Air Command wanted the limits reduced ideally to the internationally recognized limit of three miles, or as a fall back, the Soviet declared twelve-mile limit for its territorial waters, while the US State Department and Lieutenant General Lauris Norstad, Deputy Chief of Staff, Operations, sought a 40-mile limit to avoid provoking the Soviets.⁴⁵ During this internal Air Force-Department of State debate, another strategic air power vision captured headlines.

Reminiscent of General Arnold's "Air Power for Peace," retiring Air Force Chief of Staff General Carl A. Spaatz articulated atomic war fears in two *Life* magazine articles in July and August 1948. In "If We Should Have to Fight Again," Spaatz reconfirmed the lessons of World War II by citing conclusions from the US Strategic Bombing Survey:

Even a first-class military power . . . cannot live long under full-scale and free exploitation of air weapons over the heart of its territory. . . . For the future it is important fully to grasp the fact that enemy airplanes enjoying control of the sky over one's head can be as disastrous to one's country as its occupation by physical invasion.⁴⁶

He tied these lessons to the Berlin Crisis by stating:

⁴³ Truman, *Memoirs*, vol. 2, 123, 125.

⁴⁴ Memorandum, Subject: Limit on Offshore Distance for Recon Flights in Pacific Areas and R&R, Subject: Limit on Offshore Distance for Recon Flights in Pacific Areas, Major General C. P. Cabell, Director of Intelligence, Office of Deputy Chief of Staff, Operations, 27 Jul 1948, File: 2-3060, Folder: 2-3003 to 2-3099 (Jul 1948), Entry 214, RG 341, NA.

⁴⁵ The investigation of the Soviet diplomatic protest generated eight Air Staff studies on the issue of "Photographic coverage—Chukotski Peninsula" between December 1947 and May 1948. These studies led to two more staff papers related to establishing a 40-mile limit on reconnaissance flights in the Pacific area between May and July 1948. Each staff study or memorandum contained a staff summary sheet that captured the key arguments of the documents. A good summary of the arguments may be found in Memorandum for Record, Subject: Limit on Offshore Distance for Recon Flights in Pacific Area, [July 1948], File: 2-3060, Folder: 2-3003 to 2-3099, Box 42, Entry 214, RG 341, NA.

⁴⁶ General Carl A. Spaatz, "If We Should Have to Fight Again," *Life*, July 5, 1948, 35.

Some months ago, however, a force of B-29s was gingerly moved into Western Europe. . . There is reason to believe that they have created an impression of purpose, resolution and strength far beyond their numbers. Indeed it is difficult to understand what does restrain the Russians from seizing Berlin, unless it is respect for American airpower.⁴⁷

In the event the B-29 deterrence and Berlin Airlift failed to prevent war, Spaatz argued that a sea blockade would be “ineffectual against a self-contained heartland power like Russia” and that a land war would be problematic; approaches from the south, north, east, and west blocked by distance, terrain, and climate. He cited Winston Churchill’s advice, “If you should ever go to war with Russia, whatever you do never try to invade that country’s vast space.”⁴⁸ Therefore, a future war would feature an air atomic strategy:

When the airman looks at Russia, the 8,500,000 square miles of maneuver ground that appall the foot soldier shrink to a relatively few decisive target areas. It is theoretically possible to demonstrate on the basis of the war just finished that the precision bombing of a few hundred square miles industrial area in a score of Russian cities would fatally cripple Russian industrial power.⁴⁹

In August 1948’s “Phase II Air War,” Spaatz alerted the American public to the dangers of a Soviet “flash” attack. He explained that US national security in the atomic age would consist of three phases: Phase I (current for 1948) consisted of a US monopoly on the atomic bomb; In Phase II other nations would possess the bomb; and Phase III described a future of possible intercontinental war with supersonic planes and guided missiles. Spaatz’s article reinforced the Polar Concept:

If war breaks out in Phase II, then, we must be prepared for the possibility that the Russians would send against us a striking force of some hundreds of long-range bombers. It would no doubt be launched against us in secrecy and probably carry atomic bombs. It would issue in a number of groups simultaneously from the east coast of Siberia and from the Murmansk tundra. Some would dart across the polar sea. And we must expect that many of the attackers would get through our defenses.⁵⁰

In both *Life* articles, intended for a mass audience, General Spaatz voiced a previously classified concern of air intelligence analysts: Soviet B-29 type bombers flown from Siberian

⁴⁷ Ibid., 36. General Spaatz is referring to the deployment of the 301st Bomb Group, equipped with B-29s, to Europe on 28 June 1948. R&R, Richard McMullen to Historical Section, Strategic Air Command, 12 Aug 1949, *History Strategic Air Command 1948*, Vol. 4: *Supporting Documents*, File: 416.01 v. 4 1948, AFHRA. Historian Harry R. Borowski pointed out that none of the B-29 groups, the 301st, 28th, and 307th, that deployed during the Berlin Crisis was equipped with aircraft capable of dropping atomic bombs, although most people did not realize the fact. Harry R. Borowski, *A Hollow Threat: Strategic Air Power and Containment Before Korea* (Westport, CT: Greenwood Press, 1982), 126.

⁴⁸ Spaatz, “If We Should Have to Fight Again,” 39.

⁴⁹ Ibid.

⁵⁰ General Carl A. Spaatz, “Phase II Air War.” *Life*, 16 Aug 1948, 91.

bases. In his July article, Spaatz described the Soviet internment of three intact US B-29s during the latter months of World War II and evidence of Soviet attempts to reverse engineer the aircraft. He then described reports of Russian B-29 type airplanes being spotted over Moscow which were then confirmed at the 1948 May Day parade:

In a formidable column of aircraft over Moscow appeared a formation of four-engine bombers, also called the Tupolev, which were obviously the bomber imitation. . . . Although there were only 10 "B-29s" in this parade, there is reason to believe that the Russians now possess several hundred of them and are manufacturing more at a fairly good rate.⁵¹

Spaatz summarized the danger by observing, "From either Murmansk or eastern Siberia practically every U.S. industrial area of consequence falls within the Tupolev's one-way, no-return range."⁵² Although critics might be tempted to dismiss General Spaatz's articles as mere hyperbole to maintain Congressional funding for the new B-50 and B-36 bombers entering service in 1948, the articles not only summarized some Air Force intelligence assessments, but emphasized the importance of photographing the Chukotski Peninsula airfields.⁵³

Faced with a strategic imperative articulated by General Spaatz and an operational dilemma regarding limits to approaching Soviet territory, an unexpected tactical solution emerged that solved yet another practical problem associated with the Polar Concept. Searching for answers to the limits of short focal-length aerial cameras, Air Material Command's Colonel George W. Goddard led a team that produced new experimental cameras of 48-, 60-, and 100-inch focal length. These new cameras offered a technological solution: a series of special missions flown with a 20-mile restriction from Soviet territory and the use of Goddard's new, experimental K-30 camera with a 100-inch focal length.⁵⁴ Flown in October and November 1948, the missions examined the southern Soviet shore from approximately 179° E to a point on the northern shore 175° E, including Wrangel Island.⁵⁵

The long-range aerial photography of the Chukotski Peninsula quickly abated the immediate worries of a Soviet B-29 attack. The photographs revealed that the Soviet airfields in

⁵¹ Although officially designated the Tupolev Tu-4, early US air intelligence documents did not learn of the nomenclature till later and simply used the term "Soviet B-29" or "Russian B-29 type." Spaatz, "If We Should Have to Fight Again," 44-45.

⁵² *Ibid.*, 45.

⁵³ "The Russian B-29" in Memorandum for Colonel Hugh D. Wallace from Colonel Robert Taylor III, Chief, Collection Branch, Air Intelligence Requirements Division, Directorate of Intelligence, 8 Mar 48, File: 2-8389, Folder: 2-8300 to 2-8399, Entry 214, RG 341, NA.

⁵⁴ Col George W. Goddard pioneered early aerial photography, including photographing parts of Alaska during General Hap Arnold's demonstration of the Martin B-10 bomber in 1934. At this time, the 100-inch camera was one of a kind and not fully tested. Brig Gen Walter R. Agee, Chief Air Intelligence Requirements Division, Directorate of Intelligence, to Commander, Alaskan Air Command, letter, 15 Dec 1948, File: 2-5676A, Folder: 2-5600 to 2-5699, Box 43, Entry 214, RG 341, NA.

⁵⁵ R&R Sheet, Major General George C. McDonald to [Lieutenant General Earle E. Partridge.] Director of Plans and Operations, Subject: Photographic Coverage – Chukotski Peninsula Airfields, 23 Apr 1948, File: 2-1432, Folder: 2-1400 to 2-1499, Box 41, Entry 241, RG 341, NA.

question were not suitable for imminent bomber operations. The results confirmed a Strategic Air Command August 1948 Air Intelligence Briefing that viewed airfields at Uelen, Bukhta Providenya, and Anadyr on the Chukotski Peninsula and bases in the Petropavlovsk-Northern Kuriles (much farther south) as “The many difficulties inherent in arctic conditions tend to suggest that Northeastern Siberia will not become a base for a powerful air offensive against North America in the event of war in the immediate future. . . . [But] “it constitutes potentially a strategic base for launching air attack against North America.”⁵⁶ In other words, General Spaatz’s vision for strategic air war may have been valid for Soviet potential, but significantly overstated Soviet air attack capabilities in 1948.

To a large extent, aerial photography of the Chukotski Peninsula ended the pioneering era of Arctic aerial reconnaissance and marked the transition to a normalized, routine vigilance. In an after-action letter, the Commander-in-Chief, Alaskan Air Command lauded the excellent results of the 100-inch and 48-inch long-range cameras and urged continuous coverage (sorties at least every three months) for future comparison. He sought procurement of a 100-inch camera for the command by 1 March 1949 and explained the benefits of photography over a range of light and surface conditions.⁵⁷ In addition, by July 26, 1948, the Air Force Directorate of Intelligence significantly tightened control of arctic aerial reconnaissance operations by issuing an “RCM Ferret Program-Alaskan Air Command” that specified collection objectives, formalized procedures, and adopted the State Department’s 40-mile limit to prevent unsanctioned overflights and diplomatic incidents.⁵⁸ Finally, by November 1948, the 72nd Reconnaissance Squadron formally completed Operation FLOODLIGHT (Project No. 5), the original reason for deploying aerial reconnaissance assets to Alaska. The final report recapped the “very extensive collection of tri-metrogon photos of the Polar ice pack . . . a source of valuable knowledge of such data as the distribution, thickness, and smoothness of Polar ice” and recommended the downgrade of its security classification so others might benefit from the data.⁵⁹

The early months of Project NANOOK and Operations POLARIS and EARDRUM represented military innovation and cutting-edge exploration of the unknown. The histories of the 46th and 72nd Reconnaissance Squadrons highlighted the dedication, ingenuity, and initiative of relatively junior officers and NCOs who overcame daunting obstacles imposed by weather, terrain, and isolation. Developing grid navigation, cold-weather flying and maintenance procedures, arctic photography and mapping, the personnel of the 46th and 72nd Reconnaissance

⁵⁶ Headquarters Strategic Air Command, Intel Brief No. 63, “Soviet Air Facilities in Northeastern Siberia,” 2 August 1948, File: 416.606-63, AFHRA.

⁵⁷ Commander-in-Chief, Alaskan Air Command to Chief of Staff, United States Air Force, Subject: Importance of Long-range Photography to Alaskan Theater, n. d. [Dec 1948], File: 2-5676A, Folder: 2-5600 to 2-5699, Box 43, Entry 214, RG 341, NA.

⁵⁸ Major General C[harles] P. Cabell, Director of Intelligence, to Commanding General, Alaskan Air Command, Subject: RCM Ferret Program – Alaskan Air Command, 26 Jul 1948, File: 2-3027, Folder: 2-3003 to 2-3099 Jul 48, Box 42, Entry 214, RG 341, NA.

⁵⁹ Staff Summary Sheet, Subject: Photography of Floodlight (Project No. 5), 18 Nov 1948, File: 2-5373, Folder: 2-5600 to 2-5699, Box 43, Entry 214, RG 341, NA.

Squadrons showcased the new Air Force as problem solvers, willing to grant tactical autonomy and resist burdensome oversight. The 1946-1948 arctic aerial reconnaissance effort transformed the Polar Concept from a simplistic vision, derived simply by looking at a globe, to a strategic war-planning reality.

Solving the Polar Concept's tactical and operational challenges also revealed significant flaws in American air power strategy. As shown by the visions of strategic air warfare published by Generals Arnold and Spaatz, American air leaders held rigidly to a series of assumptions of future war: it would be a total war, a global war, an atomic war similar to, but even more destructive than World War II. The next war required a powerful, modern, atomic force-in-being because of the genuine likelihood of a nuclear Pearl Harbor. American air atomic strategy and the Polar Concept also assumed a mirror image of the Soviets. The Soviet B-29 and Chukotski Peninsula scare assumed the enemy would fly across the Pole and "nuke" the United States just as the US planned to do to the Soviets. At no point did the air leaders raise Clausewitzian questions: what was the political objective? What was the desired end-state (other than survival)? Did the end justify the ways and means? No Air Force documents of the period questioned the assumptions, proposed alternatives, or explored limited war. In many ways, Alaska aerial reconnaissance represented a conceptual linchpin as well as an operational and tactical cornerstone to the air atomic strategy of the late 1940s.⁶⁰

The intellectual and resource focus to solve successfully the practical aspects of the Polar Concept overshadowed Air Force efforts to think through the greater strategic questions. Thus, the early Air Force operations in Alaska demonstrated both the tactical and operational strengths of the new service marked by determined, innovative problem solving, and its strategic conceptual limitations that would become readily apparent in its next war, not the "flash attack" of World War III, but the infantryman's grind in the hills of Korea.

⁶⁰ In fairness, Generals Arnold, Spaatz, and other senior airmen can hardly be blamed for focusing on operational and tactical concerns. They were only a few years removed from the major air battles associated with World War II's strategic bombing campaigns and had devoted the majority of their professional lives solving practical problems and not conceptual strategic thinking.