ON THE WINGS OF THE WIND: THE U.S. AIR FORCE SECURITY SERVICE AND ITS IMPACT ON SIGNALS INTELLIGENCE IN THE COLD WAR

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by Philip C. Shackelford
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Thesis written by

Philip C. Shackelford

Approved by

_____, Advisor

_____, Acting Chair, Department of History

Accepted by

_____, Dean, Honors College

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DEDICATION

This work is dedicated to Thomas W. Shackelford, Jr., Larry Tart, and Duane Lorentzen, with many thanks and deep respect for their service in the USAFSS during its early years and the legacy which they left for all the airmen who would follow in their footsteps.

Thank you all.

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Introduction

The United States Air Force Security Service (USAFSS) was a clandestine signals and electronic intelligence gathering organization which formed an integral part of the American intelligence community post-World War II. Established soon after the United States Air Force became its own distinct branch of the armed forces in 1948, the primary objective of the USAFSS was the widespread collection of electronic, signals, and communications intelligence pertaining to the mushrooming Soviet threat. Known to the military community as ELINT, SIGINT, and COMINT, these various intelligence types were relatively new phenomena in the history of intelligence gathering[1] - and yet as advanced technological capabilities continued to improve, were becoming a central component of Washington's never-ending struggle to keep an eye on their counterparts in Moscow. Together with the establishment of the National Security Agency (NSA) only four years later, the USAFSS would eventually be responsible for hundreds of secret listening posts around the world, closely monitoring the radio, telecommunications, and electronic correspondence of the Communist world.[2]

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[1] Gerhard L. Weinberg, "The European Theater: Comment" (comment on papers presented at the Thirteenth Military History Symposium, U.S. Air Force Academy, Colorado Springs, Colorado, October 1988), 187-92.

[2] Larry Tart, *Freedom through Vigilance, 1948-1979 History of U.S. Air Force Security Service Volume One: USAFSS Headquarters and Women in USAFSS* (West Conshockton, Pennsylvania: Infinity Publishing, 2010), 3-4.

After World War II the United States faced a time of uncertainty and re-adjustment, and this strongly affected the American military establishment as well. Up until this point the United States had not maintained a standing military during times of peace, but now a previously unknown fear gripped the nation. With the Japanese attacks on Pearl Harbor, an important military base on American soil had been decimated by surprise air attack, and suddenly Americans realized that the domestic territory of the United States was not impervious to outside aggression. However, many in the United States government believed that America would be better served by completely withdrawing from foreign commitments. Not only would America not become embroiled in conflicts abroad, risking surprise attacks, but by adopting a more "non-interventionist" approach to foreign policy the government would also be able to more effectively focus on domestic and economic policies.

A polarizing debate thus developed, between the advocates of "isolationism" and those who believed that the United States should take a more proactive approach to its national security. It soon became clear which side had the upper hand, and aggressive post-World War II military demobilization programs were reversed. President Harry Truman committed significant numbers of American troops and military infrastructure to peace-keeping and reconstruction posts overseas, developed a highly centralized Department of Defense, and promised economic and military aid to various European countries struggling to rebuild after World War II. Alongside this significant military

expansion, government officials also began to realize the importance of an effective intelligence community, and despite considerable opposition, began taking steps to establish a robust and effective intelligence network that would provide valuable information to various government and military consumers.

The USAFSS was part of this movement, not only designed to monitor the encrypted wireless radio traffic of the Communist world but also tasked with guarding American communications security. Even though the USAFSS initially did not have much manpower or much of an operational focus, the young organization soon inherited a few mobile radio squadrons from its Army counterpart, and soon the USAFSS developed into an effective, innovative, and outstanding communications intelligence agency. Through their intense dedication and high caliber of technological expertise the USAFSS became known as a foremost producer of signals intelligence and soon developed expertise in other technological platforms as well, such as radar early warning systems and photographic reconnaissance.

As a result, the USAFSS played a major role in both the Korean War and every other major conflict throughout the Cold War, leaving an impressive and lasting legacy for signals intelligence efforts that were to come. This thesis argues that this significance and impact was due both to the high caliber of technological proficiency developed by the USAFSS, as well as the close working relationship they maintained with the National

Security Agency (NSA) after its inception in 1952. This assertion is supported, not only by various government documents generated by the military and intelligence expansion programs of the 1940s and 1950s, but also by a number of oral history interviews, letters, reminiscences of former USAFSS personnel, and official historical surveys published by the current Air Force intelligence organization, the Air Force Intelligence, Surveillance, and Reconnaissance Agency (AF ISR Agency). These primary materials are able to build on the foundation established by extensive secondary research to illustrate and explore the storied history of the USAFSS and its Cold War activities.

The historical survey of signals or communications intelligence during the Twentieth Century is often limited to chapter-length acknowledgements inside larger works that cover the history of intelligence gathering in general. Intelligence historians often focus their research on the already widely covered and celebrated SIGINT exploits of the Allies during World War II. A few others have developed works on the post 9/11 intelligence community, national security issues, and privacy concerns. Very few monographs, however, are devoted to the development and expansion of SIGINT efforts during the Cold War specifically. A particularly significant explanation for this discrepancy is a dearth of sufficient primary source material as, according to leading intelligence historian Matthew M. Aid, few secrets are more closely guarded than the

signals intelligence activities of the United States government, beginning with the early Cold War and continuing through the present time.[3]

Even less scholarship exists that focuses on the individual services and government agencies that spearheaded American SIGINT efforts during the early Cold War. The United States Air Force Security Service, in particular, is largely passed over in the historiography - either due to a lack of interest or knowledge of its existence, or the previously mentioned lack of declassified information. Even fewer works, however, examine the significant influence which the USAFSS enjoyed over early SIGINT operations, nor how this influence was enhanced by a close working relationship with the National Security Agency and a commitment to taking advantage of the latest technological innovations. This thesis, then, strives to reconcile portions of this disparity by highlighting and examining the early days of the USAFSS, and by evaluating its impact through dealings with the NSA and use of advanced communications technologies.

However, there is one series of monographs which focuses exclusively on the Air Force Security Service. Senior Master Sergeant Larry Tart, United States Air Force (Ret.), was a Morse intercept analyst and an airborne intercept mission supervisor with the USAFSS until 1977, when he began working with a defense contractor as a systems

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[3] Matthew M. Aid and Cees Wiebes, *Secrets of Signals Intelligence During the Cold War and Beyond* (New York: Frank Cass Publishers, 2001), 1, 11.

engineer and programs manager. Since that time Mr. Tart has devoted much of his time to the research and collection of USAFSS history into a multi-volume treatise, aptly named *Freedom through Vigilance*. However, rather than standing as a scholarly analysis of the USAFSS, its operations, and impact, Mr. Tart's work serves as a detailed and carefully arranged account of the various units and detachments, their operations, and the Cold War missions they carried out. That said, Larry Tart presents in his history an important step in the research journey, and succinctly presents the significant events which outline the beginnings of the USAFSS.[4]

In particular, volumes I through III contain the most concentrated amount of historical information, specifically describing the roots which the USAFSS had in the United States Army Air Corps and Signal Corps. Tart observes that although when the USAFSS was activated in 1948 it had no clearly defined mission nor its own personnel with which to operate, it wasn't long before the organization inherited some detachments from its U.S. Army parent and counterpart. Like much of the American military's COMINT or SIGINT paradigm, the USAFSS had its roots in the cryptologic activities of World War II as well. The United States Air Force, after becoming its own distinct branch in 1947, recognized the need to create a separate and independent signals intelligence service. This task, a remarkably open and flexible charter, was given to then Colonel

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[4] Larry Tart, *Freedom through Vigilance, 1948-1979 History of U.S. Air Force Security Service* (West Conshockton, Pennsylvania: Infinity Publishing, 2010).

Richard P. Klocko, who would return to command the entire USAFSS as a Lieutenant General in 1962.[5]

In a more general fashion, other scholars recognize and trace the roots of modern signals and communications intelligence to its fledgling application during World War I. Historian and author Jeffrey T. Richelson, who is also a senior fellow with the National Security Archives, observes that the value of COMINT had been recognized during World War I and that the communications technology that made this new method of spying possible improved dramatically during the inter-war years. By the time of World War II communications security had become a valid concern, but during the war COMINT became a very important source of information, as good or better than many traditional human intelligence sources. COMINT or SIGINT also provided an outlet for the release of strategic misinformation if necessary.[6] However, communications intelligence still had its limitations and was not applicable to every communication situation. Land lines could not be intercepted and therefore the content of the messages they carried could not be decrypted and read. COMINT had still not advanced enough to be the most important element of defense.[7]

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[5] Larry Tart, *Freedom through Vigilance, 1948-1979 History of U.S. Air Force Security Service Volume One: USAFSS Headquarters and Women in USAFSS* (West Conshockton, Pennsylvania: Infinity Publishing, 2010), 7, 29.

[6] Jeffrey T. Richelson, *A Century of Spies: Intelligence in the Twentieth Century* (New York: Oxford University Press, 1995), 173.

[7] Ibid., 178-180.

Nevertheless, codebreaking was central to Allied success during World War II, and, as other scholars have pointed out, it is evident that the extent of American COMINT operations was not reduced simply because World War II had come to a close. Instead, the focus and coverage of COMINT grew as the organizational mission of American COMINT services grew and expanded as well.[8] This expansion, through the actions of Harry Truman and the revised National Security Council Intelligence Directive 9, eventually gave rise to the Central Intelligence Group or CIG, the Armed Forces Security Agency (AFSA), and the National Security Agency (NSA). In his book *The Secret Sentry: The Untold History of the National Security Agency,* intelligence historian Matthew Aid focuses primarily on the growth, responsibilities, and challenges of the NSA. However, in beginning his narrative Aid covers the complicated and often difficult history of the Armed Forces Security Agency, which, as a consolidated association of the branch signals intelligence services, includes the early days and struggles of the USAFSS.[9]

Other scholars, however, put aside the political and strategic implications of intelligence history and instead focus on examining the various technological innovations that made increased and expanded signals intelligence efforts possible, as well as the influence that the process of gathering SIGINT had on developing communication

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[8] David Alvarez, "Trying to Make the MAGIC Last: American Diplomatic Codebreaking in the Early Cold War", *Diplomatic History* 31, no. 5 (November 2007): 865-68.

[9] Matthew Aid, *The Secret Sentry: The Untold History of the National Security Agency* (New York: Bloomsbury Press, 2010), 19.

technologies. In investigating how the USAFSS was so significant in terms of the technological innovations and technical prowess which characterized its innovations, this thesis will join such scholars as Nigel West and Michael Warner. West, in his work *The SIGINT Secrets: The Signals Intelligence War, 1900 to Today,* surveys the development of signals intelligence technology, capability, and application from the beginnings of strategic interception. Ultimately beginning with the telegraph and soon after the radio, once the interception of wireless communication was possible, an entirely new field of intelligence gathering was born. Warner, on the other hand, discusses how technology is often mentioned as a tool or a target for intelligence gathering, but how very little has been written about the influence of technology on "intelligence systems."[10]

In summary, while the existing scholarship on signals intelligence is limited, often specialized, and often included inside larger, broader works - and while the literature that specifically mentions the United States Air Force Security Service is even scarcer - certain examples do exist and serve as a fascinating scholarly conversation. This thesis will make use of these sources in considering and joining the discussion with a focus on the USAFSS, its connections to the NSA, and the various technological elements which came to represent part of the USAFSS's commitment to excellence and vigilance.

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[10] Michael Warner, "Reflections On Technology and Intelligence Systems", *Intelligence and National Security* 27, no. 1 (February 2012): 134-35.

Chapter I:
SIGINT and its Importance in 20th Century Warfare

The practice of using secretly gathered knowledge about an adversary to defeat him or thwart his plans is essentially as old as warfare itself. The process of gathering this information is known as human intelligence, or HUMINT, and requires a spy or double agent to be installed in a position that allows him or her to gather this information without raising suspicion.[11] However, HUMINT is and has always been an extremely dangerous enterprise - detection by the enemy not only means an abrupt end to the information stream but also spells significant personal danger for the spy involved - up to and including imprisonment, torture, and death. However, beginning in the early 20th Century opposing armies and governments began to rely more on communications intelligence (COMINT), using cryptologic methods to encode and transmit secret messages concerning enemy movements, expected developments, or other strategically important information. The examples of this practice are as varied as the civilizations which utilized them, from smoke signals and long range drum beats among native tribal populations, the practice of tattooing secret messages on the heads of servants and allowing their hair to regrow over them, or the use of the Caesar Cipher during the times of the Roman Empire.[12] By the time of the American War for Independence cryptography had grown to

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[11] Military History Quarterly, "Espionage in Ancient Rome", *The Quarterly Journal of Military History* (June 12, 2006): www.historynet.com/espionage-in-ancient-rome.html.

[12] J.A. Richmond, "Spies in Ancient Greece," *Greece and Rome* 45, no. 1 (April 1998): 11-13.

include complex codes and ciphers and the use of misinformation to distract enemy forces.[13]

Human intelligence efforts remained the mainstay of military intelligence gathering throughout the rest of the 18th century and most of the 19th century - both professional and amateur spies being employed by opposing military forces to cross enemy lines, scout ahead of an advancing army, and even monitor enemy newspapers.[14] Yet as the American Civil War erupted and tore violently through the country, a new kind of intelligence gathering began to emerge, fostered by the simple communication needs of the maneuvering armies. Now that the telegraph had been invented, generals and commanders had the ability to send messages much more quickly and efficiently than the traditional hand written dispatches, and many military detachments now included a signal corps. However, the presence of Morse telegraphs encouraged attempts by the enemy to intercept them, and thus the practice of encoding and decryption took root in this earliest form of signals intelligence. Through this chain of events military forces in America moved from an entirely HUMINT based intelligence gathering paradigm to include early SIGINT efforts - a development which changed the way in which wars would be fought and brought American society even closer to the 20th century.[15]

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[13] Christopher Andrew, *For the President's Eyes Only* (New York: HarperCollins, 1995), 8-10.

[14] Andrew, *Eyes Only,* 14-15.

[15] Peter Maslowski, “Military Intelligence Sources During the American Civil War: A Case Study” (proceedings of the Thirteenth Military History Symposium, U.S. Air Force Academy, Colorado Springs, Colorado, October 12-14, 1988).

However, even though signals intelligence organizations had not yet become a regular element of modern militaries, opposing forces continued to realize and appreciate the usefulness and effectiveness of signals intelligence - and the science and its military applications continued to develop. By the late 1890s Guglielmo Marconi had begun experimenting with electromagnetic radiation, demonstrating that signals could be transmitted and received wirelessly. Known as radio communications, Marconi was able to span the Atlantic Ocean with his new communications system by 1901, which then became commercially available in 1907.[16] Wireless telegraphy immediately began to impact military intelligence operations. During the Russo-Japanese War, British and Japanese intelligence officials collaborated to intercept both wireless and telegraph cable dispatches sent by the Russian military,[17] and the signals intercept capabilities only continued to expand.

With the outbreak of World War I, SIGINT began to capture a devoted and growing group of followers as well as financial and operational support from militaries and governments that were now realizing the importance of signals intercept and cryptanalysis efforts as World War One began ravaging Europe. Perhaps the most famous and influential collection of SIGINT experts was the clandestine British operation known

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[16] National Research Council, *The Evolution of Untethered Communications* (Washington, D.C.: National Academy Press, 1997), 15-16.

[17] Mark and Liubica Erickson, *Russia War, Peace, and Diplomacy* (London: Weidenfeld & Nicolson, 2004), 42.

as Room 40.[18] Led by Sir Alfred Ewing, the codebreakers and signals intelligence experts of Room 40 were responsible for expanding the knowledge and capabilities of signals intelligence dramatically. Not only did they become proficient at monitoring, intercepting, decrypting, and analyzing German wireless telegraph communications, but they were also able to develop warning systems for approaching German U-boats and early fighter planes.[19] Also, World War One revealed how influential information captured through SIGINT could really be through the interception and analysis of the Zimmerman Telegram, which the British used to convince the United States to enter the war.[20] SIGINT had officially established itself on the world stage.

This trend spread almost exponentially during World War II. According to the first volume in a series of historical monographs compiled and released by the National Security Agency, World War II set in motion and sustained a revolution in the history of intelligence gathering. Signals intelligence played such a pivotal role in the success of various World War II campaigns that the conflict was later dubbed a "SIGINT war" by scholars revisiting this period.[21] The U.S. Signal Intelligence Service went from a scant

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[18] Jeffrey T. Richelson, *A Century of Spies: Intelligence in the Twentieth Century* (New York: Oxford University Press, 1995), 37.

[19] Nigel West, *The SIGINT Secrets: The Signals Intelligence War, 1900 to Today* (London: Westintel Research Limited, 1988), 73-80.

[20] Richelson, *Spies,* 43.

[21] Thomas R. Johnson, *American Cryptology During the Cold War, 1945-1989 Book I: The Struggle for Centralization, 1945-1960* (Fort Meade, Maryland: Center for Cryptologic History, National Security Agency, 1995), 1-7.

two dozen personnel at the time of the war's outbreak in 1939 to an operation employing over ten thousand codebreakers, analysts, and technicians by the end of World War II in 1945.[22] As a result, American and other Allied SIGINT services harvested a staggering amount of actionable intelligence while simultaneously setting new standards and breaking new ground in organizational efficiency, technical accomplishments, and the sheer rate of production attained by these pioneer codebreakers. Needless to say, the success stories of the combined Allied SIGINT efforts were more than enough to convince American military leaders that a strong SIGINT contingent would be a crucial element in the development of a vibrant post-war military intelligence community - a fact that Air Force Colonel Richard P. Klocko witnessed firsthand.[23]

Richard Klocko had graduated from the United States Military Academy in 1937 and immediately began flight training, which he completed the following year. Klocko's first assignment with the Army Air Corps was with the 36th Pursuit Squadron out of Langley Field, Virginia, but soon he was reassigned to England as part of the European Theatre of Operations Headquarters where he served until October 1942. At this time Klocko was given command of the 350th Fighter Group being put together in England. After preparing for combat with the P-39 fighters that comprised portions of the unit Klocko transferred with his command to North Africa in order to help support the

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[22] David Alvarez, "Trying to Make the MAGIC Last: American Diplomatic Codebreaking in the Early Cold War", *Diplomatic History* 31, no. 5 (November 2007): 865-66.

[23] Lt. General Richard P. Klocko, interviewed by James C. Hasdorff, Hilton Head, SC, October 29-30, 1987.

invasion. However, in February 1943 while on a special mission across enemy lines, Klocko's plane was shot down by the Germans and he was taken prisoner of war. From North Africa he was transferred into Europe and eventually ended up at Stalag Luft III. His imprisonment continued for well over two years - it wasn't until mid-1945 that Klocko was exchanged and returned to the United States, not having set foot in the country in over three years.[24]

After arriving back in the States, Klocko was supposed to have enjoyed a few months of rest following his prisoner of war experience, and yet only two weeks had passed when Klocko received a summons to report for active duty at the Pentagon. Needless to say, Klocko was hardly enthusiastic about his new assignment. He had been counting on the opportunity to rest and recuperate from his time in the German prison camp. Nevertheless, he made his way to Washington in order to find out what was going on, and discovered that he had been handpicked for a burgeoning intelligence program and that he would be working alongside a staff of about twenty officers. These men formed part of the policy staff, which, among other things, handled papers concerning the initial establishment of the Central Intelligence Agency.[25] After a year of working in this assignment Klocko was pulled aside and given special tutorials in cryptology and

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[24] "Lieutenant General Richard Phillip P. Klocko," The Official web site of the United States Air Force, July 16, 2013, accessed July 16, 2013, http://www.af.mil/information/bios/bio.asp?bioID=6080.

[25] Richard P. Klocko, interviewed by Leslie Rosenzweig, February 4, 1975, transcript, Air Force Intelligence Oral History Program, The History Office Headquarters, Air Intelligence Agency, San Antonio, Texas.

communications intelligence and in 1947, when the Army Air Corps formally became the United States Air Force, Richard Klocko was transferred into this new branch and had the distinction of being the only Air Force officer to have been involved with cryptologic communications intelligence efforts up to that time. For this reason Klocko was given a near carte blanche opportunity to create a signals intelligence organization for the Air Force.[26] His unit, which eventually became the Air Force Security Service, would serve as an integral part of the Armed Forces Security Agency and the post-World War II intelligence community.

However, after World War II Harry Truman was determined to shrink the Federal budget, and he was also intent on orchestrating a return to pre-war "normalcy" in American society. Cutting down on government spending meant eliminating certain wartime agencies and departments, while a return to "normal" was more or less an urge to revert into isolationism, in which case the United States would not need "huge military budgets" or "secret spy agencies."[27] Nevertheless, it wasn't long before Truman realized his mistake. In order to have an effective foreign policy, the United States had to have a centralized intelligence establishment that would spearhead a coordinated post-war intelligence gathering effort. Accordingly, Truman issued a presidential directive in 1946

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[26] SMSgt Larry Tart, phone conversation with author, June 13, 2013.

[27] Stephen E. Ambrose, *Ike's Spies: Eisenhower and the Espionage Establishment* (Jackson, Mississippi: University Press of Mississippi, 1999), 162-64.

that was responsible for forming the Central Intelligence group, or CIG.[28] Although it had a few initial kinks and organizational issues, this group formed the backbone of what would eventually evolve into the Central Intelligence Agency. However, while the CIA began to coordinate covert operations and HUMINT efforts for the government, each branch of the military still controlled their own SIGINT operations, resulting in a decentralized and unfocused signals intelligence enterprise.[29] It wasn't until the establishment of the National Security Agency in 1952 [30] that SIGINT was given a central command structure and coordinated operating procedure on par with other intelligence gathering activities.[31]

Subsequently, even though the basic framework for a unified intelligence community had been laid during the Truman administration, with signals and communications intelligence as a central cornerstone and a new emphasis, it was under Eisenhower's presidency that electronic intelligence gathering truly became one of the Washington's highest priorities.[32] Eisenhower himself was particularly dedicated to the development of an effective intelligence network in the hopes of preventing a surprise

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[28] Ibid., 164-65.

[29] SMSgt Larry Tart, phone conversation with author, June 13, 2013.

[30] Memorandum from President Harry Truman to the Secretary of State and the Secretary of Defense concerning Communications Intelligence Activities, October 24, 1952. Downgraded per NSC Information Security Oversight Office on January 28, 1981.

[31] Larry Tart, June 13, 2013.

[32] Dino A. Brugioni, *Eyes in the Sky: Eisenhower, the CIA, and Cold War Aerial Espionage* (Annapolis, MD: Naval Institute Press, 2010), 418.

attack by the Soviets - a fear that haunted him throughout his period in the White House.[33] A report submitted by the "Brownell Committee" - a special committee led by Congressman George Brownell to survey the communications intelligence activities in 1951 - announced that "the witnesses before our Committee have been unanimous in testifying that COMINT ranks as our most important single source of intelligence today,"[34] and recommended certain measures which would tighten COMINT production efficiency and re-organize the command structure of the existing communications or signals intelligence community.[35] This report, commissioned under Truman by Secretary of State Dean Acheson and Secretary of Defense Robert Lovett, would actually carry the most significance for the Eisenhower administration.[36]

Eisenhower took the recommendations of the Brownell Committee seriously. The National Security Agency received groundbreaking benefits from the Eisenhower administration.[37] Within four years the NSA employed almost nine thousand employees, while the service cryptologic agencies - such as the USAFSS - employed about that many

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[33] James R. Killian, *Sputnik, Scientists, and Eisenhower: A Memoir of the First Assistant to the President for Science and Technology* (Cambridge, Mass.: MIT Press, 1967), 68.

[34] George A. Brownell, Chairman et al., *Report to the Secretary of State and the Secretary of Defense by Committee Appointed by Letter of 28 December 1951 to Survey Communications Intelligence Activities of the Government* (Fort Meade, Maryland: Declassified by Director, NSA/ Chief CSS, 1981), 29.

[35] Ibid., 129-130.

[36] *Cryptologic Almanac 50th Anniversary Series: The Creation of NSA - Part 2 of 3: the Brownell Committee* (Fort Meade, Maryland: National Security Agency), 1.

[37] Christopher Andrew, *For the President's Eyes Only: Secret Intelligence and the American Presidency from Washington to Bush* (New York: HarperCollins, 1995), 216-17.

more. In 1957 the new NSA headquarters was completed at Fort Meade, Maryland - which included the largest and most sophisticated computer complex in the world at the time. This went hand in hand with Eisenhower's Project Lightning - the world's largest government sponsored research program in computer technology up to that time and involving such technology giants as IBM, RCA, General Electric, and MIT. This was characteristic of Eisenhower's push for a modernized military. It was a long range plan centered on the military applications of cutting edge science and technology. As far as intelligence was concerned, some of Eisenhower's objectives included aerial photographic intelligence, new SIGINT applications, and enhanced surveillance radars.[38]

Concerned as he was about the possibility of surprise attack, in 1954 Eisenhower formed and was subsequently guided and counseled by the Surprise Attack Panel, headed by the President's science advisor James Killian. The panel had three subcommittees, one of which focused on intelligence,[39] and the studies undertaken by this panel emphasized the need for effective strategic intelligence. Specifically, the "Killian" panel investigated the current state of intelligence gathering initiatives with regard to preventing a surprise Soviet attack. The panel's final report in 1954 emphasized the importance of a much stronger factual base for intelligence projections, better strategic warning systems in the event of a surprise attack, and reductions in the potential for misinterpretation of threats.

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[38] Thomas C. Reed, *At the Abyss: An Insider's History of the Cold War* (New York: Presidio Press, 2005), 31.

[39] Stephen E. Ambrose, *Ike's Spies: Eisenhower and the Espionage Establishment* (Jackson, Mississippi: University Press of Mississippi, 1999), 267.

To correct these issues, the panel recommended a "vigorous program for the extensive use of the most advanced knowledge in science and technology." In particular, the U-2 spy plane was the first tangible application of the panel's findings and recommendations.[40]

Thus began the transition away from SIGINT as a central emphasis in U.S. intelligence efforts, making room for photographic intelligence, or PHOTOINT. Together the U-2 reconnaissance overflights and the CORONA spy satellite program - pressured onward by the Soviet launch of *Sputnik* in 1957 - gave the Eisenhower administration and subsequent White House leaders the eyes they needed to peer behind the Iron Curtain. Nevertheless, SIGINT continued to play an integral role in the collection of valuable information regarding Soviet military movements, technological developments, and weapons stockpiles. Yet the collection platforms were not limited to secret USAFSS or NSA listening posts. One of the American military's most effective nuclear deterrents - the nuclear powered submarine - was also an extremely valuable intelligence gathering platform.[41] Soon these new submarines began to embark on a highly secretive intelligence gathering initiative crafted by the Navy and President Eisenhower.

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[40] Albert D. Wheelon, "CORONA: The First Reconnaissance Satellites", *Physics Today* (February, 1997): 25-26.

[41] Lt. Kevin Carr, United States Navy, (Ret.), emailed to author, Cleveland, Ohio, February 12, 2013.
Lt. Kevin Carr was a cryptologic specialist and Russian linguist working in support of U.S. Naval intelligence requirements during Operation HOLYSTONE. Note: this represents the author's conclusions regarding Lt. Carr's service, as Lt. Carr is prohibited from explicitly confirming these details under the provisions of Title 18 U.S. Code.

Known as HOLYSTONE, this program was at high risk of causing a confrontation with the USSR because of the boldness it required. Specially equipped, nuclear powered and nuclear armed attack submarines were tasked with collecting electronic, communications, and photographic intelligence. Their target - the increasingly closed sphere of the Soviet Union.[42] These submarines would silently approach major Soviet ports, training bases, and shipyards from the safety of the North Atlantic's dark, deep waters and begin a process of collecting photos, signals intercepts, and other intelligence that would be transmitted back to waiting American authorities. Because of the incredible risk of detection and confrontation that these submarines faced, all operations were conducted in a "wartime posture," requiring that their skippers be seasoned sailors and experienced strategists. One wrong move, "one misstep - say, the accidental sinking of one submarine by another - could have triggered the war the United States was trying to prevent."[43] Possessing the key intelligence these submarines targeted was vital for preventing and predicting future Soviet operations that might lead to actual nuclear war, and yet one single solitary mistake on the part of either side could have resulted in an undersea battle that would have started that war.

Taking all into consideration, then - communications, signals, and by extension electronic intelligence formed the backbone of the American intelligence community that

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[42] Jeffrey T. Richelson, *A Century of Spies: Intelligence in the Twentieth Century* (New York: Oxford University Press, 1995), 306-7.

[43] Peter Sasgen, *Stalking the Red Bear: The True Story of a U.S. Cold War Submarine's Covert Operations Against the Soviet Union* (New York: St. Martin's Press, 2009), 6-7.

developed after World War II. As a result, despite the precious little information available to researchers regarding SIGINT activities during the last century, SIGINT has been championed by officials and scholars alike as the single most important source of intelligence for the United States and our European allies throughout the entire Cold War period.[44] The significance of SIGINT and the actionable information obtained through SIGINT activities has only increased. Needless to say, such an important discipline as signals intelligence includes compelling implications and lessons in the history of our modern society.[45] As would be the case with the USAFSS specifically, developments during this time period would lay the foundation for all other intelligence agencies that were to come.

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[44] Matthew M. Aid and Cees Wiebes, *Secrets of Signals Intelligence During the Cold War and Beyond* (New York: Frank Cass Publishers, 2001), 1, 11.

[45] West, *SIGINT Secrets,* 28.

Chapter II:
Listening In: The Armed Forces Security Agency and the Birth of USAFSS

Despite sporadic yet ardent pressures to withdraw from global politics and a general wariness of large spy agencies, the Truman administration realized that building a healthier intelligence network would be an essential component of an effective national security program.[46] In the United States, only a handful of intelligence organizations had been around to carry the burden of supplying the military and the government with information during World War II. Over the next few years, these various agencies were overhauled, disbanded, consolidated, and reorganized - with Truman himself overseeing many of the changes. This reversal of post-World War II de-mobilization and actual expansion of American military power was rooted in a new concept which began to affect American politics and foreign policy, a concept known as the national security doctrine. National security was a concept that was not actually voiced until after the Japanese attacks on Pearl Harbor, and it articulated the general hopes of Americans to prevent such an attack from happening again, especially in the late 1940s with the disintegration of relations between the Soviet Union and the West and the nuclear arms race.

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[46] Memorandum from President Harry Truman to the Secretary of State and the Secretary of Defense concerning Communications Intelligence Activities, October 24, 1952. National Security Archive Electronic Briefing Book No. 24.

As a result, the United States government could no longer concentrate its resources on the few countries designated most threatening to American security matters. If global war ever broke out, especially now with the existence of nuclear weapons - then global intelligence coverage was a vital necessity. Pioneered by former attorney Alfred McCormack in 1942, then a newly commissioned colonel in the U.S. Army, this philosophy became the "organizational mission of American communications intelligence."[47] National security was a highly controversial topic, however, requiring as it did the constant attention of the government and military and even the creation of several new intelligence agencies, which was not popular in the post-war congress. A politically charged debate then ensued between the proponents of national security and the more non-interventionist members of the American government, with each side striving to point out the benefits of their perspective. Ultimately proponents of military expansion under the national security doctrine began to gain the upper hand, and it was into this world that top-secret government agencies such as the United States Air Force Security Service and the National Security Agency were born.

The United States Air Force, newly formed out of the U.S. Army Air Forces, was enjoying the fame, success - and, of course funding - that was generated by their

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[47] David Alvarez, "Trying to Make the MAGIC Last: American Diplomatic Codebreaking in the Early Cold War", *Diplomatic History* 31, no. 5 (November 2007): 868.

romanticized exploits during World War II.[48] The Allies had not failed to see the potential power and decisiveness which a strong air arm could provide, as Hitler's *Luftwaffe* had often demonstrated. During and after the war American commanders relied heavily on massive bombers, both for devastating air attacks and intimidation. Generals such as Curtis Emerson LeMay pushed hard and eventually received permission to build a colossal bomber force, known as the Strategic Air Command. This bombing fleet was to become one of the central elements of nuclear deterrence during the early days of the Cold War, as research and development continued to yield bigger, more reliable, and more powerful aircraft. Despite its relative unproven existence as a separate entity, the Air Force was initially supported by the experienced World War II leaders of the U.S. Army and was able to garner the best and brightest of America's scientific community in constructing a strong, effective, and efficient military organization.[49]

This was especially true of the USAFSS. While at the time of its establishment in 1947 the Air Force did not have a communications or signals intelligence service, the leadership almost immediately recognized the need for one, and hand-picked Richard Klocko for the job. Klocko himself had no background in intelligence, but was soon

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[48] In particular, the exploits of the Army Air Forces were portrayed in several wartime films, including *Aerial Gunner* (1943), *Air Force* (1943), *Thirty Seconds Over Tokyo* (1944), *Winged Victory* (1944), *God Is My Co-Pilot* (1945), and *Fight Squadron* (1948), as well as the Cold War era film *Strategic Air Command* (1955), starring Jimmy Stuart. Profiles of all these films can be viewed at the Internet Movie Database, www.imdb.com.

[49] Walter J. Boyne, *Beyond the Wild Blue: A History of the U.S. Air Force* (New York: St. Martin's Press, 1997), 35-37.

brought up to speed by members of the "Old Guard" of American cryptology, so to speak - mathematicians and codebreakers on the order of William Friedman, who represented the American SIGINT elite at the time of World War II. Also, the circle of former U.S. Army officers who staffed the new Air Force were much more receptive and appreciative of emerging technological innovations. They were more inclined to develop an expertise in the systems that would, eventually, give the Air Force the cutting edge in military science. As a result of the dedication, efficiency, and initiative with which personnel of the Air Force applied themselves to developing an effective intelligence network and other groups, it was not long before the Air Force became known as the premier authority on matters of strategic deterrence, military science, and intelligence.[50]

Such a transition did not take place over night, however. In an 1975 interview, Klocko described how the young U.S. Air Force had been primarily a consumer of intelligence, making use of information as it came in after being collected by other intelligence agencies - and limited information at that. Working as an intelligence staffer, Richard Klocko was a member of a body known as the Special Security Organization, responsible for creating security protocols and regulations, overseeing the personnel who had been cleared for intelligence knowledge, and setting up a more organized "consumer structure." This referred to the organization of which government agencies were primarily involved with collecting intelligence information, and which agencies then

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[50] Lt. General Richard P. Klocko, interviewed by James C. Hasdorff, Hilton Head, SC, October 29-30, 1987. Air Force History Index online database, U.S. Air Force Historical Research Agency.

were the primary users of the collected and analyzed information. However, the Air Force was eager to set up its own intelligence production organization, with which to begin producing their own intelligence and establish their independence from the already existing Army Security Agency and Navy Security Groups - the only two signals intelligence and communications security organizations that existed at the time.[51]

Nevertheless, even the decision of which organization would staff and direct the new office within the larger Air Force framework was an issue which had to be ironed out. Both Air Force Intelligence and Communications wanted to staff and take charge of Klocko's new security creation, thus directing day-to-day operations as well as Air Force signals intelligence efforts. However, Klocko had a different plan. Since the cryptologic and communications security organization they were trying to develop would actually support the entire Air Force, and not just intelligence or communications, Klocko suggested that it be made into a major command. Personnel from the Air Staff would be able to populate the entire command and perform their various duties without political or agency affiliations, from communications security down through logistics, personnel, and even training. After some deliberation, Klocko's proposal was accepted and the Special Security Organization became the United States Air Force Security Service.[52]

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[51] Richard P. Klocko, interviewed by Leslie Rosenzweig, Lubbock, Texas, February 4, 1975.

[52] Ibid.

However, while important for the early development of the USAFSS, its initial independence from Army and Navy counterparts was not to last. As mentioned earlier, despite rampant inter-service rivalries which had characterized World War II military cryptologic activities, the signals intelligence organizations of the United States Army, Navy, and the newly formed United States Air Force combined in 1949 to establish the Armed Forces Security Agency (AFSA).[53] This was an attempt to bring an end to the turf wars by providing a more centralized command structure for the service agencies. While there was still much to be done - jurisdictions and organizational wrinkles to be ironed out, it was at least a start. Still, inter-service rivalry continued to be a problem for the next few years and often threatened to derail intelligence operations - until review by the Brownell Committee concluded that American communications intelligence activities were too important to be left to disintegrate, and recommended yet another re-organization which began in 1952.[54] In addition, the number of countries and amount of material surveyed in the new American intelligence initiatives only increased with the close of World War II. It therefore became the mission of the AFSA member agencies to target the communications and signals operations of their Soviet counterparts, while simultaneously monitoring and protecting the communications security of our own

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[53] Thomas R. Johnson, *American Cryptology During the Cold War, 1945-1989 Book I: The Struggle for Centralization, 1945-1960* (Fort Meade, Maryland: Center for Cryptologic History, National Security Agency, 1995), 26.

[54] George A. Brownell, Chairman et al., *Report to the Secretary of State and the Secretary of Defense by Committee Appointed by Letter of 28 December 1951 to Survey Communications Intelligence Activities of the Government* (Fort Meade, Maryland: Declassified by Director, NSA/ Chief CSS, 1981), 29.

military efforts. America's first agency devoted entirely to signals intelligence had been born.

The USAFSS underwent its first real test with the outbreak of the Korean War in 1950. Going into the conflict the USAFSS was only two years old and did not have a large amount of trained personnel to support intelligence operations in a full-scale war, and would end up growing considerably throughout the war. Nevertheless, the USAFSS went immediately into action, trained several of its men in the Korean language, moved a mobile radio squadron into Korea, and began collecting intelligence. The information these units collected enabled UN air and naval forces to anticipate North Korean movements, while later in the war intelligence provided by the USAFSS allowed American fighters to inflict heavy losses on the North Korean air forces, and by the end of the war the USAFSS was conducting its first airborne interception missions over the Korean Peninsula. As the war came to a close the USAFSS had grown into an sophisticated intelligence organization of almost twenty thousand people.[55]

In summary, both the initial motivation and determination displayed by the founders of the USAFSS would ultimately secure the organization a front-row seat to the coming SIGINT war against the Soviet Union. After the establishment of the National Security Agency in 1952, the USAFSS would continue to develop as an organization and

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[55] A Brief History: From USAFSS to AIA - A Legacy More Than Half A Century Old Continues (San Antonio, Texas: U.S. Air Force Intelligence, Surveillence, and Reconnaissance Agency), 3-4.

secure a reputation as an extremely effective, efficient, and astonishingly secret signals intelligence organization. As SMSgt Larry Tart outlines, they accomplished this through several different ways. Starting almost from its establishment, mobile radio signal interception units of the USAFSS included analysis capabilities, where their Army and Navy counterparts did not. Later the USAFSS developed both the technology and infrastructure for airborne intercept missions which "far exceeded" the capabilities of the other service communications intelligence groups. The USAFSS was quickly surpassing its other service counterparts and would continue to grow as it focused on the "real" mission - monitoring the encrypted wireless communications of the Soviet Union.[56]

[56] SMSgt Larry Tart, emailed to author, October 7, 2013.

Chapter III:
A Unified Mission: SIGINT and the Soviet Target

Part of the mission for which the USAFSS was originally established involved monitoring United States Air Force communications security. Indeed, keeping an eye on U.S. military communications was all that Airman First Class Duane "Al" Lorentzen imagined when he arrived at his first assignment at a USAFSS listening post at Elmendorf Air Force Base in Alaska. He remembers being quite astonished when, as he walked into the central operations room, a giant map of the Soviet Union was hanging on the wall. Quickly Lorentzen discovered that his unit would be concerned with a very different mission than he had anticipated - listening in on the encrypted radio transmissions of Soviet military communications.[57]

Electronic espionage had grown steadily in importance since the end of World War II. Successfully penetrating the "Iron Curtain" with field agents was next to impossible, and the risk of detection was great. Still, the United States had developed the need for accurate, up to date, and reliable information about their Soviet counterparts. This perspective was voiced as early as 1946 by Clark Clifford, Special Counsel to President Truman. He said:

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[57] Airman First Class Duane Lorentzen, emailed to author, May 23, 2013.

Suspicious misunderstandings of the Soviet Union must be replaced by an accurate knowledge of the motives and methods of the Soviet government. Only through knowledge will we be able to appraise and forecast the military and political moves of the Kremlin; without that knowledge we shall be at the mercy of rumors and half-truths.[58]

The responsibility for providing this kind of reliable intelligence fell to organizations like the USAFSS, which were not only involved with the interception and decryption of various communication signals, but also made use of radar in order to monitor Soviet air traffic close to the United States and around the accessible borders of the Soviet Union. One of the earliest ways which the USAFSS collected this information was through an extensive and continually growing network of ground stations.

Ground stations grew out of Allied codebreaking efforts during World War II, especially in England, where cryptographers and mathematicians sequestered themselves away to crack the Nazi communication codes, in places like Bletchley Park and Chicksands Priory. Because of the specific manner in which radio signals left the Soviet Union, bounced around the globe, and returned - England was in a prime location for zoning in on these particular signals and targeting them for interception. After the close of World War II and after the United States Air Force had established itself as a player in the signals intelligence community, USAFSS scientists and officers began searching the world for advantageous locations for ground sites. Taking advantage of England's proximity to the Soviet Union and the high rate of success that could be achieved in the

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[58] Report, "American Relations With The Soviet Union" by Clark Clifford ["Clifford-Elsey Report"], September 24, 1946. Conway Files, Truman Papers, Truman Library.

interception of Soviet signals from England's countryside, the USAFSS leased and began establishing one of their first foreign ground stations at a small Royal Air Force (RAF) airfield in Kirknewton, Scotland. By 1953, the base had mushroomed into a major listening post employing hundreds of highly trained airmen and was intently focused on their clandestine mission of eavesdropping on the Soviet Union.

Airman First Class Thomas W. Shackelford, Jr. was one of the hand picked recruits that shipped out for RAF Kirknewton in late 1953. After rigorous basic training at Lackland Air Force Base in San Antonio, Texas and then highly specialized cryptographic communications training at Warren Air Force Base in Cheyenne, Wyoming, AFC Shackelford was given thirty days of leave with his family back in Northeast Mississippi before reporting to a pre-designated embarkation point in New Jersey. He and his fellow airmen boarded their ship on Christmas Eve, 1953. The voyage to England took a week. They were processed at an Air Force office in London, briefed on some initial procedures on how to interact with the British people, and then given British money for train fare from London to Edinburgh, Scotland. The train station, however, was on the other side of the city and no transportation was provided - despite having only one hour before departure time. Shackelford recalls how he and nine of his fellow American cryptologic communications operators crammed themselves into two British taxi cabs for the trip across town. Using British currency was a new experience for all of them, so they had no idea whether or not the cab driver charged a fair price after

delivering them to the train station - but at least they had arrived and were set for the next leg of their journey - a train ride of several hours from London to Edinburgh.[59]

An Air Force bus was waiting to pick up the newly arrived airmen as their train came in and transported them a few more miles to the listening post at Kirknewton. By this time it was the middle of the dark Scottish night, and the airmen could tell very little about the base that was their new home. Had they been able to see, AFC Shackelford remembers, "we might have gone A.W.O.L" right then. Both the base itself and the various buildings that made up the enlisted barracks and other portions of the American outpost were in decrepit condition. Constant rain dug potholes in the thinly paved roads, while gravel patching made for a persistently muddy route. Nevertheless, as Shackelford points out, the heart of the base was the USAFSS Communications Compound - it was the only reason for an American establishment to exist at RAF Kirknewton. Only a select few of the hundreds of Air Force personnel present at Kirknewton had the appropriate security clearance to even enter the Communications Compound, and still fewer possessed the higher security clearance necessary for entering the cryptologic operations room inside the Communications Compound. AFC Shackelford, however, was one of those men. Indeed, his security clearance was higher than any of his fellow airmen - only

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[59] Letter, Thomas W. Shackelford to Philip and Joseph Shackelford, September, 2009.

the commander of the base himself possessed a cryptologic security clearance equal to Shackelford's.[60]

Needless to say, security was extremely tight at the USAFSS Communications Compound. Surrounding the building itself was a high fence with barbed wire and an armed guard on duty around the clock. This guard was responsible for checking the passes of approaching personnel, and no one without the appropriate pass entered the Communications Compound. Inside the building several other levels of clearance were required, especially for admission into the cryptologic operations room, which was protected by thicker walls and a single, steel door with a sliding peep hole - which was locked at all times and had to be opened from the inside. The walls of the cryptologic operations room were thick and soundproof, built to withstand attempts at forced entry long enough for the technicians inside to destroy any classified material, including the teletype machines and code keys. Inside the cryptologic operations room, all classified materials were kept in reinforced metal filing cabinets which were also rigged with an incendiary explosive which would destroy the entire contents of the case in the event of an emergency. Once ignited these devices could not be extinguished, and would produce a heat hot enough to melt teletype and cryptographer machines. Finally, the personnel inside the cryptologic operations room were armed with two automatic machine guns as a last resort - a weapon not built for accuracy but instead for maximum impact, able to

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[60] Letter, Tom W. Shackelford to Philip and Joseph Shackelford, December, 2010.

empty a thirty round clip in a matter of about eight seconds. The men inside the cryptologic operations room were constantly tested. No one - not even a much higher ranking officer - could be permitted inside the room without first producing the appropriate security badge, and acquiescing to the demands of even a colonel or general who wasn't cleared for admittance could mean serious consequences for the airman who let them in.[61]

The mission at RAF Kirknewton began with an intense focus on the interception of Soviet Morse code messages and then actual voice radio transmissions in Russian. A contingent of about thirty USAFSS cryptologic radio operators was stationed in the main area of the Communications Compound with earphones and typewriters, tracking signals as they were picked up by the array of different antennas the USAFSS personnel had arranged along an unused runway. The signals were intercepted, decrypted, and compiled, and then multiple copies were made for various intelligence agencies back in Washington. One of the major set of signals that the airmen focused on tracking involved monitoring naval activity along the northern coast of the Soviet Union - both military and commercial. By listening in on the radio transmissions between submarines and their control centers on base USAFSS radio operators could determine the objectives of training missions, experiments, and could track naval movements.

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[61] Letters, Tom W. Shackelford to Philip and Joseph Shackelford, 2011.

Sometimes Soviet movements could be particularly concerning. In 1955, during his tour at Kirknewton, Thomas Shackelford was tasked with going through the base commander's personal papers. The major was being transferred back to the States, and his personal collection of documents had to be appraised. Relevant material would be preserved, while duplicates or unimportant documents would be destroyed, and as the only other person on base with an equivalent security clearance, the job fell on Shackelford's shoulders. However, one of the documents he remembers from this review covered the interception of a new signal, which at the time had been deemed especially important. Three extra radio operators had been sent in from the headquarters at Chicksands to concentrate exclusively on the new signal and times were tense. As he read it, Shackelford now realized that the operators at Kirknewton had actually been listening to submarine experimental propulsion trials as the Soviet navy tried to implement a water jet propulsion system to make their subs run much quieter, in a chain of events eerily prophetic of the strained standoffs that would later develop between the submarine forces of the Soviet Union and the United States.

Soon, however, the mission at Kirknewton expanded to include intercepts pertaining to the establishment of new Soviet radar systems and the tracking of Soviet air traffic communicating with their control bases on the ground. Not only this, but by 1955 the USAFSS contingent at Kirknewton had developed the capability of intercepting facsimile transmissions - able to capture both photographs and other information sent

wirelessly to different posts throughout the Soviet Union by Soviet news organizations. The technology was evolving, and yet - USAFSS ground stations and secret listening posts were not the only manner in which the United States Air Force had begun listening in on the encrypted transmissions of the Soviet Union. Airborne intercept missions were also beginning to yield significant results, and followed the traditional trajectory of developing capability in terms of intelligence collection: first encrypted Morse radio intercepts, then voice transmissions, and eventually even photographs. The reach of the USAFSS was expanding, and while still confined to the edges of Soviet airspace for the time being, persistent efforts continued to bring about fruitful harvests of information.

In summary - while the USAFSS did take on responsibility for monitoring and protecting Air Force communications security, its real mission lay in collecting information about the Soviet Union by tracking, intercepting, and decrypting everything from Morse radio transmissions to news facsimiles from hundreds of strategically placed ground stations like RAF Kirknewton. However, before the end of the decade the USAFSS had also begun risky airborne interception missions, collecting information regarding the construction of new radar systems, and even select photographic intelligence initiatives. The episodes mentioned in this chapter not only illustrate the dedication with which the USAFSS radio and cryptologic teletype communications operators pursued their mission, but also reveal the extent of USAFSS security protocols and the degree of technological proficiency that was to become a distinguishing

characteristic of the USAFSS and its personnel. Signals intelligence collected on the Soviet target was one of the most important sources of such information during the entire Cold War period.

Chapter IV:
Sputnik and Photographic Intelligence

Despite the considerable military transformation that was set in motion during Truman's presidency, SIGINT and military expansion became an even larger priority during the Eisenhower administration. Espionage had taken on an entirely new technical dimension, and mobile SIGINT units of the Armed Forces Security Agency, including those of the USAFSS, began to spread throughout the world and form a watchful ring around the Soviet Union. Technological capability, however, was growing by leaps and bounds and had already exceeded mere radio signal interception from strategically placed ground stations by the time Eisenhower took office in 1953. Airborne interception flights were now skirting the Soviet Union's tightly closed borders, relaying important or particularly mysterious signals back to various USAFSS headquarters and ground station analysis teams throughout Europe and the Mediterranean. In addition, some SIGINT teams had begun monitoring newly established Soviet radars and intercepting telemetry from Soviet practice missile launches, collecting whatever information could become useful in staying a step ahead or disproving the boisterous claims of the Kremlin's industrial system.

And yet, even as signals or communications intelligence was coming into its own as a particularly valuable tool in the Western arsenal, another form of information was

becoming increasingly desirable. Photographic intelligence - aerial photographs of Soviet missile silos and military establishments, snapped from the safety of a plane flying just outside Soviet airspace - were to become crucial cornerstones of American intelligence during the 1950s and 1960s. Though this trend had begun with a few select missions, carried out by USAFSS or other Air Force pilots, the military and intelligence communities soon realized the full potential of photographic intelligence and began exploring ways to enhance and advantageously exploit these new capabilities. It was this effort, spearheaded by the CIA, that gave rise to the famed U-2 spy plane.

Because of certain internal Air Force regulations, any new plane constructed had to be a multi-purpose aircraft - able to fight, transport, bomb, etc. The Director of Central Intelligence under Truman, Allen Dulles, wanted an aircraft that would act exclusively as a spy plane, unencumbered with the capacity and other capabilities necessary for a more versatile plane. As a result, coordination and execution of the spyplane project was left to the CIA. The Agency had been acquiring secure areas throughout the United States for testing, research, and development purposes. In 1951 the CIA had purchased one such site near Groom Lake, Nevada, called the Nevada Test Range. In subsequent years this range came to be known as Area 51. Previously a testing facility for atomic weapons development during World War II, Area 51 became ground zero for the CIA's development of the U-2 spy plane. Together teams of pilots, engineers, scientists, and

military officials began to set up shop at Groom Lake.[62] Numerous prototypes were built and tested, with the technicians finally arriving at a small, extremely light, and incredibly flimsy design which was able to fly high enough and fast enough to outrun Soviet anti-aircraft weapons. Thus, even if the U-2 was detected by Soviet radars, which wasn't at all probable, its survival was hopefully ensured against anything the Soviet Union could throw at it.[63]

Yet the brilliant history of the U-2 was not to last. In 1960 a U-2 piloted by Francis Gary Powers was knocked out of the sky while crossing over Soviet airspace, much of the plane itself disintegrated, and Powers himself was captured and held in Moscow's infamous Lubyanka Prison. Soviet dictator Nikita Khrushchev did not immediately mention the crash - not until four days after the fact when both the United States and the Soviet Union were involved at a summit in Paris, successfully destroying any chance of the talks bringing about a much hoped for end to the Cold War. NASA released the official cover story, that a weather research plane had gone missing somewhere over Turkish airspace, implying that it had strayed off course into the Soviet Union. Nevertheless, Khrushchev angrily railed against the United States in passionate speeches, dashing any further hopes that the peace talks might be salvaged and order restored. Ultimately the U-2 program was discontinued - but in subsequent negotiations

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[62] Annie Jacobsen, *Area 51: An Uncensored History of America's Top Secret Military Base* (New York: Little, Brown, and Company, 2011), 50-58.

[63] Jeffrey T. Richelson, *A Century of Spies: Intelligence in the Twentieth Century* (New York: Oxford University Press, 1995), 264-68.

French president Charles de Gaulle scored an important point by observing that the Soviet Union was also engaged in reconnaissance overflights - by satellite.[64]

The Soviet Union had launched a satellite named *Sputnik I* in 1957, sparking a veritable frenzy in the United States as politicians and the citizens they represented reacted with strong displays of fear, fearful that the United States had been turned out of its foremost place as the technological and scientific leader of the world, but also afraid that nuclear war could now be waged from space. Many Democrats in Congress went on the offensive, buying into the infamous "missile gap" of popular opinion and accusing the Eisenhower administration of deserting its national security responsibilities in the interest of balancing the national budget. However, the truth was that the United States military could have placed a satellite into orbit well in advance of the Soviet launch had it realized such action was necessary, but Eisenhower was not in the habit of approving expensive defense projects which he deemed unnecessary - and despite growing concerns, was staying remarkably well informed of Soviet progress through U-2 overflights. Nevertheless, a secret photo reconnaissance satellite program was already in the works. This program would later become known as CORONA.[65]

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[64] Stephen E. Ambrose, *Ike's Spies: Eisenhower and the Espionage Establishment* (Jackson, MS: University Press of Mississippi, 1999), 279-89.

[65] Neil Sheehan, *A Fiery Peace in a Cold War: Bernard Schriever and the Ultimate Weapon* (New York: Random House, 2009), 362-65.

Reconnaissance satellites had been contemplated as early as 1946 by the RAND (Research and Development) Corporation in California, in a study titled *Preliminary Design for an Experimental World-Circling Spaceship.* Then, in February of 1948, only five months after being designated an independent branch of the military, the U.S. Air Force asked RAND to put together a satellite research project that would explore development of various components and technical requirements that would be necessary for placing a spy satellite into orbit. By 1954 a report from the RAND Corporation recommended that the Air Force "undertake at the earliest possible date completion and use of an effective satellite reconnaissance vehicle as a matter of vital strategic interested to the United States." Then came *Sputnik,* with all the drama and desperation that surrounded it, and in 1958 President Eisenhower approved Project CORONA. Interestingly enough the administration of this project was again led by the CIA, but much of the rockets and other technology on which the satellite was based came from Air Force research and development projects which had been making significant progress throughout the 1950s.[66]

Meanwhile, the USAFSS had added to its already impressive repertoire of signals intelligence collection missions by beginning photo reconnaissance flights around the peripheral borders of the Soviet Union and Eastern Bloc countries. In 1954 the 7499th Support Squadron located in Wiesbaden, West Germany was organized with a two-fold

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[66] Jeffrey T. Richelson, *American Espionage and the Soviet Target* (New York: William Morrow and Company, Inc., 1987), 174-77.

mission: electronic and photographic reconnaissance. The squadron was divided into three flights, each with its own specific portion of the overall mission. In Flight A electronic surveillance was the first priority, but photographic intelligence remained a secondary objective. Flight B was concerned entirely with photographic intelligence, flying numerous missions over the Eastern Bloc countries and around the perimeters of the Soviet Union itself to snap valuable photographs of military establishments inside the Iron Curtain. The missions were, by necessity, surrounded by an advanced degree of secrecy, the pilots of Flights A and B often transporting actual passengers and cargo from one base to another as official cover for their intelligence collection efforts. Finally, the third flight in the squadron was composed entirely of analysts, tasked with developing, interpreting, and reporting on the photos brought back from the various missions.[67] As a result, the USAFSS was undertaking significant photographic intelligence operations well before the construction and launch of any surveillance satellite. Photographic evidence of Soviet military capabilities had become the cornerstone of Eisenhower's approach to U.S.-Soviet negotiations, and the USAFSS was doing more than their share to ensure that nothing went unnoticed.

In conclusion, as new leaders came to power both in the White House and the Kremlin, the 1950s were a period of growing fears and mounting challenges. Concerns about the perceived "missile gap" and palpable fears of surprise nuclear attack meant that

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[67] Larry Tart and Robert Keefe, *The Price of Vigilance: Attacks on American Surveillance Flights* (New York: Ballantine Books, 2001), 246-47.

effective intelligence was an even greater priority for the United States government, and the Eisenhower administration also marked a period of significant expansion, in terms of government intelligence agencies and military power. In addition, significant technological advances gave intelligence agencies a constantly expanding range of tools and capabilities. This became an invaluable asset for the Eisenhower administration. Underlying exploration and research for surveillance satellite technology began early on, but wasn't given top priority until after the Soviet launch of *Sputnik,* with the approval of Project CORONA. Instead, persistent reconnaissance flights patrolled the periphery of the Soviet Bloc, intercepting encrypted radio transmissions and capturing photographs of Soviet military establishments, and U-2 overflights stared down on the construction of missile silos and other military expansion projects, ultimately disproving the theory of the missile gap. The USAFSS played an instrumental role in the collection of photographic intelligence while still maintaining their extensive signals intelligence efforts. Intelligence as a field had simply expanded, and the USAFSS lost no time in keeping pace with the growing technological dimensions.

Chapter V:
Vietnam, the Cold War's Collapse, and a Continuing Legacy

Despite the satellite surveillance and photographic intelligence capabilities that had grown out of Project CORONA, the USAFSS still reigned as the country's signals intelligence agency and was highly skilled in radar advance warning systems. Both of these elements were critical to the national security of the United States and would become important priorities in the coming conflict in Vietnam. This chapter will focus on the role that the USAFSS played in the Vietnam War as well as the operations carried out by the USAFSS throughout the rest of the Cold War - post-Détente, into the 1990s, and will explore the lasting legacy which the current incarnation of Air Force intelligence - the Air Force Intelligence, Surveillance, and Reconnaissance Agency (AF ISR Agency) continues to build on today.

Even before the Vietnam War had begun, as early as the late 1950s, the USAFSS had arrived in Vietnam and set up a special signals intelligence office near Saigon, South Vietnam. Richard Klocko remembered that this episode specifically proved the value of the mobile units which the USAFSS had established and perfected, saying that the "ability to rapidly interchange equipment and configure or reconfigure the vans gave us the capability to respond quickly and effectively; and we did just that." Up until this point the USAFSS had not intended to get involved with Vietnam at all, but the commander of

the Pacific Air Forces, General Emmett O'Donnell tracked Klocko down during his tour of Asian bases in the late 1950s, and said that "South Vietnam is going to blow up. I want you to get out there and see what USAFSS can do to provide some support for the Air Force."[68] Nevertheless, the USAFSS quickly set up mobile ground stations in Vietnam and began carrying out crucial support operations - radar warning systems, signals intelligence efforts, etc. - for the Pacific Air Forces operating in Vietnam.[69]

Yet the next decade, the 1970s, also heralded an important change and development for the USAFSS. During the conflict in Vietnam the USAFSS had become increasingly proficient and involved with electronic warfare - highly technical operations carried out within the "electromagnetic spectrum portion of the information environment," and which involve radio frequency countermeasures, interference, jamming, electronic masking, intelligence, electronics security, and more.[70] As such, this represented one of the first major changes in technological focus for the USAFSS since including photographic reconnaissance flights as part of its mission during the late 1950s, and therefore encouraged a formal re-designation. This would come after the end of the Vietnam War, when the USAFSS was re-designated the United States Air Force

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[68] Richard Klocko, interviewed by Leslie Rosenzweig, San Antonio, Texas, February 4, 1975. Air Force History Index online database, U.S. Air Force Historical Research Agency.

[69] Harold P. Myers et al., *A Continuing Legacy: From USAFSS to AF ISR Agency, 1948-2012* (San Antonio, Texas: Air Force Intelligence, Surveillance, and Reconnaissance Agency, 2012), 13-15.

[70] Joint Chiefs of Staff, *Joint Publication 3-13.1: Electronic Warfare* (Washington, D.C.: Joint Chiefs of Staff, 2007), vi, accessed March 1, 2014, http://www.fas.org/irp/doddir/dod/jp3-13-1.pdf.

Electronic Security Command on August 1, 1979.[71] While continuing to play a "major role in keeping the U.S. leadership apprised of Soviet air force capabilities and activities throughout the Cold War,"[72] the Electronic Security Command (ESC) also provided key operational and tactical intelligence support as Détente ended and the Cold War began to heat up again. This included support for Operation URGENT FURY - the United States' intervention in Grenada in 1983[73], and continued to support such operations throughout the 1980s, including the 1986 Operation EL DORADO CANYON in Libya and Operation JUST CAUSE in Panama, 1989. The ESC had become a "primary source of numerous intelligence products for an expanding list of customers,"[74] government agencies consuming the intelligence which the ESC produced.

The 1990s, aside from bringing a much welcomed end to the Cold War conflict, were also a time of brief but intense regional conflicts across the globe, often fueled by ethnic, religious, or political unrest and by power vacuums created by the fall of the Soviet Union. Through them all, American airmen and intelligence technicians actively supported U.S. military operations through providing key intelligence and equally important technological elements such as electronic warfare, radar warning and detection systems, and more. Specifically, operations and support carried out by the ESC in

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[71] Myers, *Continuing Legacy,* 17-18.

[72] SMSgt Larry Tart, USAFSS (Ret.), emailed to Philip Shackelford, February 1, 2014.

[73] Ibid.

[74] Myers, *Legacy,* 19.

Operations DESERT SHIELD and DESERT STORM (1991) were particularly successful and of incredible value strategically, the "unparalleled success of U.S. and coalition forces . . . ushered in the age of information warfare. In the emerging information warfare doctrine, it became clear that ESC forces had helped the U.S. achieve operational supremacy over Iraqi forces."[75] This historic display of technological excellence and the subsequent astonishing success stood as evidence of the distinct dedication to technological skill and superiority which had been established by the USAFSS from the very beginning.

Meanwhile, the National Security Agency had grown considerably and developed into an extremely effective signals, communications, and electronic intelligence organization. As discussed in Chapter 2, a unified communications intelligence mission was first proposed by New York attorney Alfred McCormack in 1942, in which he pointed out the need for the United States to collect information on all countries, not just their enemies.[76] The NSA was then established in a memorandum from President Truman to the secretaries of State and Defense on October 24, 1952, which described the communications intelligence activities of the United States as a "national responsibility" and must be organized so as to "satisfy the legitimate intelligence requirements of all . . .

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[75] Ibid., 21.

[76] Alfred McCormack to Generals Bratton and Lee, February 12, 1942. NARA Records Group 457, Historic Cryptographic Collection, box 1305.

departments and agencies."[77] Nevertheless, the NSA was created to address a growing problem which had arisen among the various service agencies, operating as they ostensibly were under the Armed Forces Security Agency (AFSA). By this time the USAFSS had become virtually autonomous and had moved its headquarters to Kelly Air Force Base in San Antonio, Texas - and while technically under the operational purview of AFSA, the USAFSS had grown more and more independent and remained far more active than its Army and Navy counterparts. However, the level of autonomy enjoyed by the USAFSS was unappreciated by many throughout the government, specifically the NSA, and the inter-service rivalry that existed within AFSA led to cases of duplication and redundancy. Ultimately, review of the United States' communications intelligence establishment by the Brownell Committee in 1951-1952 recommended the strengthening of AFSA control over the service agencies, leading to the restructuring and actual abandonment of AFSA under the Truman memo and the formation of the NSA to bring a more centralized operational coordination to SIGINT activities.[78]

This chain of events has led intelligence historian Matthew Aid to describe the relationship between the USAFSS and the NSA as "very complicated and somewhat contentious," but after the NSA took over operational control from the defunct AFSA,

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[77] Memorandum from President Harry Truman to the Secretary of State and the Secretary of Defense concerning Communications Intelligence Activities, October 24, 1952.

[78] Thomas R. Johnson, *American Cryptology During the Cold War, 1945-1989 Book I: The Struggle for Centralization, 1945-1960* (Fort Meade, Maryland: Center for Cryptologic History, National Security Agency, 1995), 29-35.

there was enough of a division in missions and priorities to ensure a more efficient and equitable approach to the general communications intelligence mission. All of the service intelligence agencies were involved in the collection of communications intelligence as well as the monitoring of United States' communications security - but a memo in November 1952 specifically stated that the NSA would inherit the communications security activities previously carried out by AFSA,[79] while an Air Force document from 1958 lists communications intelligence as the first and foremost priority of the USAFSS.[80] Moreover, observations by Richard Klocko suggest that the relocation of the USAFSS headquarters from the Washington area to Texas was not due to a campaign for autonomy but instead because of a general movement to de-centralize undertaken by the Air Force.[81]

Still, the NSA was a direct descendant of AFSA and maintained a direct and close working relationship with the USAFSS throughout the early years of the Cold War. Both Duane Lorentzen and Thomas Shackelford, former USAFSS personnel, have referenced the high degree of close cooperation between the USAFSS and the NSA. Lorentzen, while discussing the USAFSS headquarters in San Antonio, admitted that he and all his

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[79] Ibid., 35.

[80] Mission, Organization, and Functions of the United States Air Force Security Service (USAFSS), Department of the Air Force, Washington, D.C., May 22, 1958.

[81] Richard Klocko, interviewed by James C. Hasdorff, October 29-30, 1987, interview 1105375, transcript, United States Air Force Oral History Program, Air Force Historical Research Agency, Maxwell Air Force Base, Montgomery, Alabama.

fellow airmen were all aware that "NSA really ran the show," and points out that many airmen, once their contract with the USAFSS had come to an end, would elect to stay in signals intelligence and would go to work for the NSA as civilian operators.[82] Both Thomas Shackelford and Matthew Aid have pointed out that all USAFSS intercepts and processing reports from the various ground stations, such as RAF Kirknewton,[83] and other USAFSS establishments worldwide, were forwarded to the NSA for "processing, analysis, and reporting."[84] Thus, while the USAFSS did not necessarily welcome NSA involvement in its tactical intelligence operations,[85] the USAFSS and the NSA did indeed maintain a strong working relationship and cooperation on strategic intelligence matters, leading James Bamford to mention the USAFSS as the "air arm" of the NSA.[86]

Today, while still technically responsible to the National Security Agency for its full range of cryptologic activities,[87] the Air Force Intelligence, Surveillance, and Reconnaissance Agency (AF ISR Agency) stands as an important testament to the early accomplishments of the USAFSS. Both in the first few years of its existence and throughout the stages of the Cold War and the post-Cold War era, the USAFSS and its

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[82] Duane Lorentzen, emailed to author, May 23, 2013.

[83] Thomas Shackelford, interviewed by author, November 30, 2013.

[84] Matthew M. Aid, emailed to author, March 8, 2014.

[85] Ibid.

[86] James Bamford, *Body of Secrets: Anatomy of the Ultra-Secret National Security* Agency (New York: Anchor Books, 2002), 96.

[87] SMSgt Benjamin Jones, (USAF Ret.), emailed to author, March 7, 2014.

subsequent reincarnations have demonstrated not only a deeply held commitment to the signals intelligence mission of the United States, but have also displayed a high level of technological skill and proficiency, the ability to adapt to changing technology, missions, and circumstances, and an outstanding capacity for innovation. Much of this is referenced in the observations of Benjamin Jones, a former Senior Master Sergeant in the AF ISR Agency and researcher in that organization's History Office. As Jones observes, the USAFSS was "immediately aware of the necessity to recruit the most brilliant and adaptable enlisted force to accomplish the mission," and in his opinion, this commitment to recruit the best men possible is the "greatest remaining standard established by the USAFSS." However, Jones also notes that "modern intelligence capabilities far surpass those of the Cold War era," and the USAFSS is responsible for setting the "precedent with innovation and flexibility, allowing the command to transition from SIGINT to a wide array of disciplines." The psychological foundation and legacy of the USAFSS, Jones believes, was and remains "built on fortitude and keen discipline."[88] Thus, the USAFSS lives on in the form of the AF ISR Agency, its members still quite aware of the rich, innovative, and compelling legacy of the USAFSS.

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[88] Ibid.

Conclusion

The USAFSS was an organization that possessed a unique, fascinating, and storied history. Not only was the USAFSS a pioneer in the peace-time signals intelligence establishment which developed after World War II, but it also laid an important portion of groundwork for subsequent intelligence agencies and left an influential legacy which would serve as a standard throughout the rest of the Cold War. As we have seen, this impact was not diminished by the collapse of the Soviet Union and the end of the Cold War, but instead, the USAFSS dedication to innovation and flexibility fostered an entirely new generation of post-Cold War operations, with current Air Force intelligence personnel taking part in a wide spectrum of technologically advanced intelligence and electronic warfare missions. This significance was due in part to the dedication with which the USAFSS devoted itself to the signals intelligence mission, but also the high aptitude for technological innovation and expertise which USAFSS airmen distinguished themselves in training and completing their assignments.

The post-World War II era was a period of tense uncertainty and fast-paced developments in both the world of foreign affairs and domestic politics. It was a time of reacting to the present while both honoring and learning from the past and yet planning for the future - a chain of momentous events which called for momentous decisions.

Many of these decisions focused on the relationship between the United States and the Soviet Union, a nation which had acted as an ally during World War II but one that was quickly becoming an enemy in the post-war world. As a result, many in the United States government felt it was necessary to establish a peace-time intelligence community - something that had not existed ever before in the history of the United States - specifically for monitoring Soviet activities and hopefully ensuring American national security. This was met with significant debate in both the government and American public opinion, obliging advocates for this intelligence expansion to justify their beliefs by pointing out the risks of not having such an intelligence establishment. The painful memories of Pearl Harbor still lingered in America's mind, and given Soviet possession of nuclear weapons, Americans came to believe that a surprise nuclear attack was not only possible but that it was a very present and growing risk. Nevertheless, the intense debate that surrounded the establishment of such a peace-time intelligence community was considerable enough for Central Intelligence Director Allen Dulles to reference in a discussion with the National Security Council, by saying:

> We now recognize that if we are to have adequate intelligence in times of crisis, we must prepare in time of peace, and we have seriously turned to the task of building up a central intelligence organization. The country has now accepted the verdict, even if somewhat reluctantly, that peace-time intelligence is essential to security and, as many of our military leaders have said, our first line of defense. It took us a long time to reach this conclusion, and we are only now gradually getting over our suspicions of intelligence and our tendency to confuse it with mere intrigue and the more lurid side of espionage. We

> are beginning to accept it as serious and honorable work and essential to our defense.[89]

The United States Air Force Security Service was part of this new intelligence establishment. Air Force officials, after the Air Force had become its own distinct branch of the Armed Services, were immediately aware that an effective signals intelligence organization would be an important element of their post-World War II composition, and Richard Klocko was tasked with creating such an organization from scratch in 1948. After this, the USAFSS seemingly took on a life of its own, growing into an extremely effective, compulsively dedicated, and brilliantly innovative intelligence agency. As demonstrated, the USAFSS led by example and these characteristics soon inspired each reincarnation of the Air Force intelligence element throughout the Cold War and beyond. Ultimately, evidence supports the argument that this high level of success was due both to the degree of technological proficiency with which the USAFSS distinguished itself, and the close working relationship that the USAFSS developed with the NSA in pursuing common strategic intelligence objectives.

In a final word, the United States Air Force Security Service was a groundbreaking and instrumental organization which not only helped to define the signals intelligence mission of the United States following World War II, but also significantly

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[89] Allen W. Dulles, William H. Jackson, and Mathias F. Correa, *The Central Intelligence Agency and National Organization for Intelligence: A Report to the National Security Council* (Langley, VA: Central Intelligence Agency, 1949), 15.

influenced every generation of Air Force intelligence personnel to come. Together with the NSA, the USAFSS dominated the American signals intelligence effort throughout the Cold War and was responsible for hundreds of crucially important operations in every conflict from Korea to the Persian Gulf. Today, the AF ISR Agency continues the work and builds on the legacy left by the USAFSS, promoting the same dedication to mission, technological excellence, and innovation which defined each previous generation.

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