

COMBAT AIRPOWER: DESIGN VERSUS USE IN A LIMITED WAR

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ABSTRACT

COMBAT AIRPOWER: DESIGN VERSUS USE IN A LIMITED WAR, by LCDR Brian L. Griffin, 84 pages.

The period between World War II and the Korean War contained many changes in the design and capabilities of combat aircraft. The Second World War influenced these changes, but time and changes in the strategic environment prevented their completion prior to the end of the war. The services argued about these changes in the post-war period to demonstrate which was the more capable service of delivering the atomic bomb against the Soviet Union, and therefore garner more funding for their organization. On the eve of the Korean War, the Navy and Air Force believed they had the answer for defeating the Soviet threat and provided the best answer for delivering atomic weapons to maintain the security of the United States.

The United States was not postured to intervene in the Korean War from the air effectively, and found the type of war they were fighting failed to meet the expectations of the interwar period. Close air support and interdiction were required to support the troops, but the operational control and some technical deficiencies hindered the effective use of the jet aircraft to support.

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ACRONYMS

CAS	Close Air Support
FEAF	Far East Asian Forces
JOC	Joint Operations Center
NKAF	North Korean Air Force
NSA	National Security Act
ROK	Republic of Korea
USSR	United Soviet Socialist Republic

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CHAPTER 1

INTRODUCTION

The problems created by the tremendously expanded importance of air power in military planning are not concerned with any questions as to the place of air power. The problem can be stated very simply: What is to be the use, and who is to be the user of air power?

—James Forrestal, *First Report of the Secretary of Defense 1948*

The United States of America has not declared war since 1941, nevertheless the United States military has mobilized and fought in multiple conflicts since. The political, economic, social, and technological environment changed considerably at the conclusion of World War II. The United States military evolved and incorporated advanced technologies and lessons from the war to best align its forces. The communists, led by the Union of Soviet Socialist Republics (USSR), appeared to threaten the United States and the world. This established the USSR as the dominant threat to the United States. Though the United States military never fought the USSR directly, it waged war through policy and proxy nations. The United States utilized a policy of containment, and directly fought enemies considered sub-standard to the capabilities and organizational structure of the United States military.

Antulio J. Echevarria's *Imagining Future War* (2007) examines the fiction and non-fiction works in the years leading up to World War I, and attempts to explain how they contributed to the events during the war. He explores the relationship of the expectations of potential future conflict and the actual events that occur during future conflicts. His historical findings compare to today and he provides a theory of how this history may be utilized to illuminate the potential of future conflicts. Taking the same

approach, the analysis of technological changes leading into the Korean War can provide an insight into how the military may look at future battlefields. This work will explore one such technology change, the combat aircraft that occurred between the end of World War II and the Korean War, and how these changes influenced the military's expectations of armed conflict during the Korean War

The Korean War ended with a cease-fire, and no defined winner. The utilization of advanced technologies in combat was not enough to defeat North Korea. One asymmetric technological advantage the United States had against its North Korean and Chinese opponents were its advanced combat aircraft. This study will explore the changes in combat aircraft from 1945-1950 and how these technological changes affected the planning and conduct of the United States military. The primary question this thesis will attempt to answer is: How did changes in combat aircraft technology between the end of World War II and the Korean War shape the United States military's expectations of future war? Secondary questions are: What changes to combat aircraft influenced the Korean War as designed? How did military leaders envision future conflicts in the five-year period? What were the expectations of the Army, Navy, Marines, and Air Force about future wars? Why were the services different in their expectations of war? How were the services organized to combat a future war, and how did that affect the outcome of the Korean War?

The format for answering these questions includes six chapters, this introduction, research design; a discussion of the political background the military operated under, an exploration of the aircraft designed post-World War II, findings of aircraft implementation during the Korean War, and a conclusion chapter. This thesis, limited to

the changes in combat aircraft technology in the United States between 1945 and the beginning of the Korean War, defined combat aircraft as: Aircraft designed to deliver munitions against enemy forces and infrastructure. Research incorporated findings from the Truman Library in Independence, Missouri, however time constraints prevented an in-depth a look into President Truman administration's correspondence. Additionally, time minimized the feasibility of exploring Navy, Marine, and Air Force archives, as well as adequately looking into how Korea and Vietnam combat airpower utilization compared.

CHAPTER 2

RESEARCH DESIGN

Research for this thesis revealed trends at the national, joint, and service levels in combat aircraft improvement and the envisioned future use of air power. First, the United States spent the majority of the period between the end of World War II and the beginning of the Korean conflict reconverting the economy to civilian production while redesigning the military establishment and retasking the military departments. Second, the United States viewed communism generally as a threat and the military establishment designed its force structure to counter the USSR specifically. Finally, the central theme among all levels of the military chain of command was the atomic bomb.

In order to answer the question, “How did changes in combat aircraft technology between the end of World War II and the Korean War shape the United States military’s expectations of future war?” the research first utilized *Papers from the President, Harry S. Truman*, and the *Secretary of Defense Reports to Congress* to establish a background for the political environment the services operated in. Next, an analysis of each of the services’ research and design priorities, production prior to the commencement of hostilities in Korea, and reasoning for these developments occurred. Finally, this thesis analyzed implementation of aircraft during the Korean conflict. In order to adequately answer the proposed question, this thesis addressed these findings in the order listed above.

The *Papers from the President, Harry S. Truman* demonstrated his administration focused on reconverting the United States economy from war production back to civilian production. The 1946 State of the Union Address to Congress included that year’s

updated budget in the speech. Though President Truman mentions the military during the speech, focusing on the return of the armed forces in a responsible manner toward the reconstruction of Japan and Germany, the majority of the speech was directed toward reconversion and building the domestic economy of the country. *Papers of the President, Harry S. Truman* provided a substantial resource for the national level strategies and the presidential administration's focus for both the military and domestic economies.

The *Secretary of Defense Reports to Congress* in 1948-1950 and the *History of Acquisition in the Department of Defense* explored the process that the United States military utilized in research and development. Though more strategic in nature, these books were beneficial to understanding the changes that occurred in the post-World War II era, and how the research priorities of the United States Department of Defense were set. In addition, both references describe the interservice rivalries that developed and how they affected combat aircraft funding and development. *Secretary of Defense Reports to Congress* in 1948-1950 are foundational in this era. The United States created the Department of Defense during these years and discussion of the evolution of priorities, concerns, and issues result through these reports.

Rearming for the Cold War: 1945-1960, written in 2012, developed the processes of research, development, and procurement processes and was instrumental in understanding the guise under which the military improved the technologies of combat aircraft. The explanations of joint research and development prioritization provided a strong resource for understanding the military establishment views of future conflict. Though these priorities centered on the employment of the nuclear weapons and defense in Europe, the discussion provided the base from which each service attempted to

demonstrate the potential for use of combat airpower in future conflicts. Additionally, the analysis of the joint boards, committees, and the individual services provided the opportunity to analyze how the military establishment supported (or in several cases did not support) the overall joint effort in improving combat aircraft for future conflicts. Further, these descriptions provided insight into the interservice rivalries and how those rivalries affected the processes for exploring new concepts, ideas, and technologies.

In order to obtain an understanding of the combat aircraft available to the United States and the types of aircraft in development throughout the post-World War II period, this thesis referenced several publications and internet websites. *Warplanes of the World*, *All the United States Air Force Airplanes 1907-1983*, and *Marine Corps Aircraft 1913-1965* all were encyclopedic in nature with beneficial information on aircraft engine type, armament, range, size, and speed. The use of the internet to access the historical sections of aircraft designer and production companies, such as Boeing and Lockheed Martin, widened the references available with the time and location of producing this thesis. Additionally, the Air Force National Museum and Naval Institute websites focused information toward the design and intent of aircraft designed during late 1940s and early 1950s.

How Navies Fight, The U.S. Navies and its Allies further enhanced understanding of the aircraft of the time because it not only discusses the naval aircraft utilized during the conflict, but also describes the issues surrounding decisions by naval leaders regarding the implementation of propeller aircraft vice jets. In addition, the book provides explanations and definitions of interdiction and close-air-support (CAS) as the United States Navy and Marine Corps define them.

At the tactical level, there are several publications that provide historical accounts of when and where fighter combat aircraft operated during the Korean conflict. *Sabre Jets over Korea, A Firsthand Account* is a memoir written in 1984 by a pilot of the Korean War. Old letters home, logged notes, and frequent stories with old comrades in arms make-up his memories to produce his book. The publication provides a view of a pilot that flew the U.S. F-86 Sabre against the daunted MiG-15 operated by Chinese and Russian pilots. This primary resource work is especially helpful in understanding the limitations, issues, and tactical understanding of the jet against jet aircraft confrontations that occurred in the skies over the Korean peninsula. Additionally, *Red Wings Over the Yalu*, written in 2002, just after release of previously unavailable Communist China documents, described battles in the two areas of the Yalu River and the Chosin Reservoir. These descriptions are paramount to understanding the successes and failures from the perspective of all services during the Korean War. *Red Wings Over the Yalu* provided counter arguments to American claims of air engagements and their successes based upon USSR and Chinese Communist Party documents.

Biographies, post-war articles, and senior naval leader analysis articles are primary sources giving decision-making concerns, performance perspectives at the time of the war, and service specific statements of successes and failures. General Matthew Ridgeway's *The Korean War* written in 1967 and General Douglas MacArthur's *Reminiscences* written in 1964 are autobiographies providing United States Army perspectives to the war. General Curtis E. Lemay's *Mission with LeMay*, written in 1965, gave substantial descriptions of the bomber issues associated with the Korean War. As the Strategic Air Command Commander during the years of the Korean War, he, in

essence, provided the bombers for the war effort and knew the training issues that the combat units in Korea had to overcome. *Airpower, The Decisive Force in Korea* is a collection of articles written by senior Air Force leaders between the end of the Korean War and 1957. This book contains the perspective of the Air Force, with topics ranging from bombing operations, fighter pilot combat, and troop carrier operations. Finally, then, Rear Admiral Arleigh Burke produced a work found in the May 2000 edition of *Proceedings Magazine* titled “Burke Speaks Out on Korea,” originally written in October of 1950. Burke’s work provided critical analysis of the services employment of combat power during the time of perceived victory in Korea.

Another resource explaining tactical issues of the combat aircraft in Korea is *The Naval Air War in Korea*, written by Dr. Richard P. Hallion. The description of aerial combat and issues associated with the involvement of different United States Navy and Marine Corps combat aircraft provided insights into how Navy and Marine Corps planned and applied aircraft during the Korean War. Dr. Hallion’s description of not only jet aircraft, but also of the helicopter and World War II era propeller aircraft referenced essential understanding to how the military confronted threats during the conflict.

Finally, three secondary sources provided historical narratives of the war and primary sources to support findings and conclusions in this thesis. *Air War Over Korea*, by Robert Jackson, *The Forgotten War: America in Korea 1950-1953* by Clay Blair, and *Joint Air Operations: Pursuit of Unity in Command and Control 1942-1991* by James A. Winnefeld and Dana J. Johnson included discussion of results of operations during the war, and war timelines.

The references for this thesis provided both broad and narrow topics to allow data collection, timelines, and insight into leaders' decisions. These sources demonstrated the service rivalries in each of the author's tones. These publications delivered the main elements in answering the question: How did changes in combat aircraft technology between the end of World War II and the Korean War shape the United States military's expectations of future war?

CHAPTER 3

POLITICAL BACKGROUND

Multiple changes within the military establishment occurred between 1945 to the beginning of the Korean conflict. The National Security Act (NSA) of 1947 established a single military establishment comprised of: the Secretary of Defense, a War Council (designated the National Security Council in 1949), Joint Chiefs of Staff, Joint Staff, Munitions Board, Research and Development Board, Central Intelligence Agency Department of the Army, Department of the Navy, and Department of the Air Force.¹ The Key West Agreement of 1948 dictated responsibilities to the Departments of Army, Navy, and Air Force. Each service operated in a political and financial environment of military downsizing, incorporating unity under the guise of a single civilian leader, and instituting processes for procurement, research, and development under a civil-military board. Additionally, the services planned, trained, and developed equipment for the practical employment and defense against the newest weapon, the atomic bomb, in a world that desired balance of power and a hope in the collective security vis-à-vis the United Nations powers.

At the conclusion of World War II, the focus of the Truman administration and the country focused on reorienting the economy to civilian production of private citizen material instead of war material. President Truman mentioned in speeches throughout the latter half of the 1940s the progress and plans for maintaining this conversion. On 9 August 1945, the day that the second atomic bomb detonated over Nagasaki, Japan,

¹U.S. Department of Defense, *First Report of the Secretary of Defense, 1948* (Washington, DC: Government Printing Office, 1948), 3-9.

Truman sent a letter to the Chairman of the War Production Board. The letter outlined five programs he desired maintained in order to ease the production conversion.² These programs were for the War Department to start focusing on short supply material production, limit production of products that did not have material available in order to prevent excess pressure on supply, institute broad and effective inventory controls, grant priority assistance to break bottlenecks, and allocate scarce materials for production of low priced items. Truman's administration desired the same government agency that effectively had made the mass war production work did the same for the civilian production. Truman also vied for, and received, legislation from congress to prolong the Second War Powers Act extending the ability of the War Production Board to effect civilian production and commodities.³ In December 1947 after the Second War Powers Act expired, President Truman formed the Office of Temporary Controls in order to consolidate agencies responsible for reconversion into a single agency.⁴ This office had authorities of the agencies it had consolidated until 30 June 1947.

In addition to the president's focus on reconversion, cuts to the budget for the military during the years between World War II and the eve of the Korean conflict

²Harry S. Truman, *Public Papers of the Presidents of the United States Harry S. Truman. Containing the Public Message, Speeches, and Statements of the President April 12 to December 31, 1945* (Washington, DC: Government Printing Office, 1961), 200.

³Harry S. Truman, Folder 1, Document 1-5 Press Release, "Presidential Address to the Congress, January 31, 1947," Economic Stabilization-Economic Stabilization Program, 1945-1953, Harry S. Truman Library and Museum, Independence, MO.

⁴Harry S. Truman, *Public Papers of the Presidents of the United States Harry S. Truman. Containing the Public Message, Speeches, and Statements of the President April 12 to December 31, 1946* (Washington, DC: Government Printing Office, 1961), 287-288.

occurred. The end of 1945 saw the budget at just over \$100 billion in expenditures. Press releases from the White House dated September of 1945 (one month following the surrender of Japan) describe the President's recommendations to rescind just over \$11 billion to the Department of the Navy, and just over \$28 billion to the Department of the Army.⁵ In the President's State of the Union Address of 1946, Truman planned to reduce the budget to just over \$35 billion by the end of fiscal year 1947. Of the \$35 billion, only \$15 billion was budgeted toward defense, war, and war liquidation.⁶ In fiscal year 1945, the United States spent nearly \$83 billion on defense (of total federal outlays of about \$93 billion) with more than 12 million uniformed Americans. By the time the Korean War started military spending had fallen to an average of about \$12 billion annually in fiscal years 1948–1950 (of total federal outlays averaging just over \$37 billion during those years).⁷ The Department of Defense continued these efforts to cut the budget as the proposed budget for 1950 figured at just over \$14 billion, and the Department of Defense reduced this number to \$13 billion.⁸ These budget cuts helped to precipitate severe interservice rivalries within the military establishment.

⁵Harry S. Truman, Folder 3, Document 3-2 Memo, "Office of Price Administration" with related material, Economic Stabilization-Economic Stabilization Program, 1945-1953 [2 of 2], Harry S. Truman Library and Museum, Independence, MO.

⁶Ibid.

⁷Elliott V. Converse, III, *Rearming for the Cold War*, vol. 1 of *History of Acquisition in the Department of Defense* (Washington, DC, Historical Office, Office of the Secretary of Defense 2012), 58.

⁸U.S. Department of Defense, *Semiannual Report of the Secretary of Defense and the Semiannual Reports of the Secretary of the Army, Secretary of the Navy, and Secretary of the Air Force, July 1 to December 31, 1949* (Washington, DC: Government Printing Office, 1949), 15-17.

As the reconversion and balancing of the budget took funding away from the military, a larger political change effecting the military organization was the NSA of 1947. A single civilian, the Secretary of Defense, led all of the military. The War Department changed to the Department of the Army, the Navy Department changed to the Department of the Navy, and establishment of the Department of the Air Force resulted. The NSA of 1947 created a new Munitions Board and Research and Development Board, chaired by a civilian chairman.⁹ The NSA of 1947 changed within a year of the original signing.

The secretaries of each of the services in the Military Establishment voiced their recommendations for change in each of their reports to congress. There was a strong desire to provide more power to the Secretary of Defense. The Secretary of the Army, Kenneth C. Royall, stated before the Eberstadt Committee, “I am convinced that the statute must either be strengthened or entirely abandoned. And, since the return to two departments would be extremely difficult as a practical manner, I think prompt and effective strengthening amendments to the unification statute (NSA of 1947) – amendments that would materially alter the present concept – are essential to our national safety.”¹⁰ Secretary of Defense, James Forrestal, iterated this point in his report to

⁹*National Security Act of 1947*, Public Law 253, Statute 61, 80th Cong., Chapter 343, 1st Session, (July 26, 1947).

¹⁰U.S. Department of the Army, *Annual Report of the Secretary of the Army, 1948* (Washington, DC: Government Printing Office, 1949) 4. Ferdinand Eberstadt an economist and friend of James Forrestal served the United States during World War II as the chairman of the Army Munitions Board and vice-chairman of the War Production Board. After the war, he headed the Hoover Commission Task Force on National Security. As a member of the Good Men, his contribution to the National Security changes in the 1940s included a corporatist approach to the establishment of the National

Congress of the same year and recommended wording changes to the NSA of 1947. The recommendation from Forrestal gave the Secretary of Defense the responsibility for exercising, vice the establishment of, “direction, authority, and control” over the Military Establishment.¹¹ Additionally, Forrestal recommended that the NSA provide an Under Secretary of Defense with the authorities of the Secretary of Defense in absence of the Secretary. Forrestal desired the Under Secretary to be the “alter ego” of the Secretary of Defense.¹²

The secretaries and the chiefs of the three departments in the Military Establishment desired these changes to the civilian leadership due in part to difficulties associated with “volunteer cooperation theory.”¹³ The frustrations within the Military Establishment is summed up in Royal’s comments to the Eberstadt Committee, “Whenever an organizational arrangement is based on the theory that decisions will be reached through consultation by co-equal parties, each of those parties having conflicting self-interests at stake, you can expect only one of two things on important issues: either

Security Enterprise. Jeffery M. Dorwart, *Eberstadt and Forrestal: A National Security Partnership 1909-1949* (USA: Jeffery Dorwart, 1991), 3-5.

¹¹U.S. Department of Defense, *First Report of the Secretary of Defense, 1948*, 15-16.

¹²Ibid. There is evidence that the Undersecretary of Defense was his highest priority, as he sent a memo to Truman requesting immediate activation of this aspect of his request from his report to congress. He explicitly states that he was willing to talk the Director of the Bureau of Budget, the Speaker of the House, and the Vice President to explain the details of the post.

¹³U.S. Department of Defense, *Semiannual Report of the Secretary of Defense and the Semiannual Reports of the Secretary of the Army, Secretary of the Navy, and Secretary of the Air Force, July 1 to December 31, 1949*, 15-16.

no decision at all, or else a watered-down compromise rarely better than no decision.”¹⁴ Forrestal further described his perceptions of the difficulties associated with military unification in 1948, however he believed that through policy control and administrative direction he could harness the “harmony of thought” and gain answers to questions of national security from a group reflecting varying experiences than from a single source.¹⁵

In addition to Forrestal’s recommended civilian leadership changes to the NSA of 1947, the Secretary of Defense desired there be a single head of the Joint Chiefs of Staff, and that person should come from one of the standing Chiefs of Staff. His desire was for that chief to be the sole individual the President and the Secretary of Defense consult to provide military staff assistance. However, Forrestal did not desire each of the Chiefs of Staff of the services to have a spot on the President’s Security Council.¹⁶ As the civilian head of the military, he desired to be the sole representative for the military.¹⁷

On 10 August 1949, President Truman announced the signing of the amendments to the NSA of 1947.¹⁸ The act changed the name of the Military Establishment to the Department of Defense. Additionally, the amendments provided the Secretary of Defense

¹⁴U.S. Department of Defense, *Semiannual Report of the Secretary of Defense and the Semiannual Reports of the Secretary of the Army, Secretary of the Navy, and Secretary of the Air Force, July 1 to December 31, 1949*, 65.

¹⁵*Ibid.*

¹⁶U.S. Department of Defense, *First Report of the Secretary of Defense, 1948*, 65.

¹⁷*Ibid.*

¹⁸Harry S. Truman, “Statement by the President Upon Signing the National Security Act Amendments of 1949,” 10 August 1949, The American Presidency Project, University of California Santa Barbara, <http://www.presidency.ucsb.edu/ws/?pid=13268> (accessed 4 February 2014).

with authority and control over the Department of Defense, and it provided for a Deputy Secretary and three Assistant Secretaries of Defense.¹⁹ The amendments of 1949 instituted a Chairman of the Joint Chiefs of Staff to provide council and assistance to the President and the Secretary of Defense.

International Politics and Collective Security

The Truman administrations' international politics also concerned the military establishment. At the conclusion of World War II in 1945, the world turned to developing an organization to promote and secure peace in the world attempting to ensure a war engulfing the world never occurred again. The United Nations was born out of this desire for collective security. In President Truman's special message to Congress on the 21-Point Program for Reconversion in 1945, he pointed out that the United States was a member of the United Nations Security Council and must share the burden of safeguarding the future of peaceful nations. He stated, "As a member of the Security Council of the United Nations, we have an immediate obligation to bear a share, commensurate with our national standing, in safeguarding the future security of all peace-loving nations."²⁰ The support for the United Nations directly affected the demobilization of forces, as Truman discussed in his statement of 8 January 1946. He once again referred to the nation's responsibility for accepting a share of defending the peace.²¹

¹⁹Harry S. Truman, "Statement by the President Upon Signing the National Security Act Amendments of 1949."

²⁰Harry S. Truman. *Public Papers of the Presidents of the United States Harry S. Truman. Containing the Public Message, Speeches, and Statements of the President April 12 to December 31, 1945*, 287-288.

²¹*Ibid.*

The United States was willing to place the atomic bomb under international control and give proprietary rights of the weapon to the United Nations under the Baruch Plan, named after its author Bernard M. Baruch a representative to the United Nations Atomic Energy Commission. The United States attempted to work through the United Nations and pushed for resolutions within the Security Council to control and avoid the use of atomic warfare due to the immense scare of the bomb just after World War II. The basics of the Baruch Plan included the establishment of an Atomic Development Authority to own, manage, and license rights to atomic bomb production, as well as promote and procure peaceful uses of atomic energy.²² As late as December 1949, Secretary of Defense Louis Johnson hoped that the United Nations resolved the Soviet Unions' obstruction of the proposal. However, the Soviet Union detonated an atomic explosion in September of 1949, which surprised the United States. They were planning defenses based upon assumptions the Soviet Union developed the atomic bomb technology no earlier than 1953.²³

Tension between the United States and the USSR developed soon after the end of World War II. As early as August of 1946, President Truman approved plans to send a Navy task force into the eastern Mediterranean as a show of force to counter Soviet Union's demand that Turkey modify their control of the Dardanelles in favor of the Soviets. Tension built even further when Yugoslavia shot down United States transport

²²John K. Jessup, "The Atomic Stakes," *Life* 21, no. 20 (11 November 1946): 77-80.

²³U.S. Department of Defense, *Semiannual Report of the Secretary of Defense and the Semiannual Reports of the Secretary of the Army, Secretary of the Navy, and Secretary of the Air Force, July 1 to December 31, 1949.*

aircraft in response to the United States pressure on the Soviets. No sooner had this tension subsided, then in 1947 the Soviets allegedly instituted Greek internal disorder. The response of the United States included legislation to assist the Greek government and the proclamation the United States supported free societies threatened by armed minorities or outside pressure. The Truman Doctrine began from this proclamation. The USSR emerged as an adversary the United States government and the military required a plan to defeat.

The years between 1945 and the beginning of the Korean conflict were tumultuous for the United States Military. The policies of the Truman administration were a cause of the development of interservice rivalries, and lead to enduring competition for resources and funding. The changes in the leadership of the military establishment to a civilian run and oversighted organization instituted a red tape organization that the military leaders had to work through. The international conflicts surrounding the use and control of the atomic bomb initiated an uncertainty to the make-up of each military organization. Finally, the Truman doctrine and the onset of the Cold War gave the military a vague understanding as to the strategic vision of the Truman administration to contain the spread of Communism. This is the background the military operated in as each service conducted technological innovation and planning for the use of combat aircraft.

CHAPTER 4

COMBAT AIRCRAFT, 1945-1953

At the end of World War II, the United States possessed one of the most innovative and destructive weapons in the world. In order to win future wars, specifically against the USSR, the United States had to lead the world in modern technologies. The atomic bomb demonstrated this lesson for the world, but the destructive power and expedience of the V-2 rockets launched on London in 1944 and the flight of a United States Air Force B-29 Superfortress from Hawaii over the North Pole to Egypt without refueling in 1946 further exemplified the potential of future weapon system. Therefore, the policies and priorities of the military establishment needed to create an inexpensive yet technologically advanced force. There would not be time to build up forces, as had been done in the previous war. Future conflicts would involve long distance aircraft carrying conventional and nuclear weapons, designed to destroy entire cities and bring a quick end to the conflict. Thus, the Douhetian theory of air warfare, in which the force that launches aircraft first will win, underlined the premise of the designs for combat aircraft.²⁴

The Joint Research and Development Board, later the Research and Development Board designated by the NSA of 1947, sought to provide oversight of the services to ensure unity of effort among them. The board developed three tools to conduct this effort: the Program Guidance, a consolidated report by the board of the status of research and development; the Master Plan for Research and Development, which established

²⁴Converse, 9.

priorities of research and development based upon eighteen warfare categories; and the technical objectives required in each of the warfare categories of the Master Plan for Research and Development.²⁵ These three documents guided and influenced the research and development within each of the services.

However, complications because of interservice rivalries greatly hindered the functionality of the Joint Research and Development Board. As late as 1949, the board did not have strategic concepts from which to plan. Secretary Forrestal directed the Joint Chiefs of Staff to produce one in 1947, but due to the inability of the Chiefs to agree on strategy for future conflicts, the direction never occurred. The Joint Chiefs postponed their strategic guidance until a later date, closer to 1951.²⁶ According to Forrestal, disagreement between the Navy and Air Force as to how strategic bombing would be planned and executed resulted in the chief's indecision. The two services would eventually come to a short-term agreement in Operation Halfmoon, an emergency war plan developed to respond to a Russian invasion of Europe in which the United States planned offensive aerial bombardment. This agreement did not last and further inhibited the functionality of the Joint Research and Development Board.

Air operations were significantly different between the services and contributed heavily to the advancement, procurement, and designs of combat aircraft. The Air Force believed the air and space component of war must be separate from the ground and naval arms of the fight and the air commander should never be subordinate to ground or naval

²⁵Converse, 28.

²⁶Ibid., 33. The date 1951 was believed to be the first year that the USSR would have developed their atomic bomb technology. The Soviets would surprise the United States and drop the first hydrogen bomb in 1949.

commanders, he should be independent. The Air Force also believed that the planning for air and space operations must occur by the air commander in order to reach a unity of effort. The Navy believed that naval air assets were beneficial to air and ground commanders, but crucial to overcoming aircraft carrier vulnerabilities. Therefore, Navy commanders controlled naval aircraft assets, the naval aircraft cannot be tied to a single battle area, and ground or air commanders cannot dictate the specific use of naval aircraft, simply a general mission set to be planned and executed by the Navy. The Marine Corps relied heavily on its air arm as a continuation of its ground force and thus the Corps' air assets must not be placed under a non-Marine commander. These core beliefs of the services were not conducive to unity within the military establishment for the advancement of combat aircraft, or any other weapon system for that matter.²⁷

The advent of the aircraft jet engine also differed based upon the philosophies of the services. For all services, the shift to jet propulsion in the 1920s and 1930s was not feasible, as the jet engine would only give aircraft a maximum speed of 250 miles per hour while burning fuel at much greater rates than propeller driven aircraft.²⁸ Though research and development in jet propulsion occurred in Europe (specifically England and Germany), the United States, through studies conducted by the Bureau of Standards and National Advisory Committee for Aeronautics, concluded throughout the latter 1930s

²⁷James A. Winnefeld and Dana J. Johnson, *Joint Air Operations. Pursuit of Unity in Command and Control 1942-1991* (Annapolis, MD: Naval Institute Press, 1993), 8-11.

²⁸Robert Schlaifer, *Development of Aircraft Engines* (Boston, MA: Graduate School of Business Administration, Harvard University, 1950), 485.

that jet propulsion was not beneficial to combat arms and propeller engines served the best purpose for military aircraft.²⁹

As early as March 1941, the future of the Army Air Force, and later the Air Force, became jet propulsion. In that year, General Henry H. “Hap” Arnold witnessed the operation of the Whittle engine and recognized the potential the technology would provide. Prior to this encounter, the Air Corps failed to put effort into the creation of jet aircraft or conversing with European counterparts as to the developments made. Part of the reason for this was a lack of recognition in the potential of jet propulsion, but most of the reason was due to the inability of the Air Corps organization to effectively and efficiently learn and exploit technological innovation in combat aircraft throughout the 1930s. In 1934, National Advisory Committee for Aeronautics reported there were limits to propeller driven propulsion, but no organization within the Army for procurement and acquisition believed they owned the responsibility to research jet propulsion. By 1940, the Army requested the National Defense Research Committee to assume responsibility, but senior members of the committee deemed the National Advisory Committee for Aeronautics as the responsible organization. To overcome the deadlock, the Army Air Force, led by General Arnold, requested National Advisory Committee for Aeronautics to convene a special committee to explore the question of jet propulsion. The committee convened in March, after General Arnold’s trip to England witnessing the Wittney engine, and recommended contract submittal for jet engine designs. Through multiple submittals and test runs, the first American aircraft flight containing jet propulsion

²⁹Dr. Mark D. Mandeles, *The Development of the B-52 and Jet Propulsion, A Case Study in Organizational Innovation* (Maxwell Air Force Base, AL: Air University Press, 1998), 52-53.

occurred on 2 October 1943 on the Bell XP-59A Airacomet. Much more research and design of the engine occurred during the war years before a combat aircraft utilized the technology for the Army Air Corps, but the subsonic jet age engulfed the organization and the future Air Force.³⁰

The Air Force struggled at its inception to define and amplify its role within the security of the nation. The atomic bomb centralized its thinking as far as what type of aircraft to build and how to implement the technology. The next war would be against the Soviet Union, and would involve nuclear strikes against large cities and industrial complexes. No longer was the United States contained between two oceans, but vulnerable from long-range aircraft that could traverse these distances.³¹ Though this fit well into the air power doctrine, the lack of atomic munitions hindered the planning for a bombing campaign against their enemy.³² The Air Force designed combat aircraft to drop not only atomic weapons, but also large numbers of conventional munitions to ensure the overall success of the bombing campaign.

The first aircraft to drop the atomic bomb in 1945 was the B-29 Superfortress. Operations in World War II employed the aircraft in earnest due to its ability to fly at elevations above 20,000 feet, allowing flight above anti-aircraft fires and the operating

³⁰Mandales, 55-56.

³¹Warren Kozak, *The Life and Wars of General Curtis Lemay* (Washington, DC: Regency Publishing Company, 2009), 267-268.

³²The air power doctrine of Giulio Douhet, in basic terms, is to bombard the enemy's center of gravity, and by destroying these objectives the enemy will be forced to capitulate. For further discussion see Giulio Douhet, "The Command of the Air," republished in Department of Military History, *CGSC Syllabus and Book of Readings* (Fort Leavenworth, KS: U.S. Army Command and General Staff College, September 2013), RA-67.

altitudes of Japanese fighters. After the war, the B-29 did not change significantly, and given to the newly formed Strategic Air Command as the weapon of choice to deliver the atomic punch in executing the United States strategic war plan.³³

However, the larger atomic bombs and travel further into Europe necessitated modifications to carry out Strategic Air Command's missions. The changes made to the B-29 required a new designation, the B-50, because of the multiple and significant improvements of the aircraft. The B-50A had 59 percent more power than the B-29, and the wings were 16 percent stronger with 600 pounds less weight for the same size wing.³⁴ In total, Boeing built 371 B-50 bombers between 1947 and 1953, though the Army ordered 60 before the end of World War II. Throughout the history of the aircraft, the missions changed from a bomber, to aerial refueling, to strategic reconnaissance. The last of the propeller piston engine bomber aircraft, the B-50 bomber continued service until as late as 1965.³⁵

Another aircraft utilized by the Air Force, through World War II and through Korea, the A-26C Invader (B-26C Invader after World War II) was a light bomber/attack aircraft the United States Air Force designated after retiring the Boeing B-26 Marauder. The first flight occurred in 1941 and mass-produced at the end of 1943 through 1944. From conception, the Invader underwent multiple changes. Changes to the Invader paralleled that of the A-26B. The Invader operated as a lead medium altitude aircraft and

³³General Curtis E. Lemay with MacKinlay Kantor, *Mission with Lemay: My Story* (Garden City, NY: Doubleday and Company Inc., 1965), 458-459.

³⁴Boeing, "B-50 Bomber," <http://www.boeing.com/boeing/history/boeing/b50.page> (accessed 11 February 2014).

³⁵*Ibid.*

signaled commencement of bombing for all A-26Bs within the formation. The most significant difference between the A-26B and A-26C Invader involved the nose of the aircraft. The A-26C contained a glass nose, while the A-26B contained a solid nose. The most significant improvements of the aircraft after World War II included strengthening of wings to handle 2,000-pound bombs and rocket launchers for 14.5-inch rockets.³⁶

The B-36 Peacemaker design incorporated long range bombing capabilities with strategic reconnaissance, mapping, and bomb damage assessment for the Air Force. Contracted for in 1941, the first flight did not occur until 1946. The Air Force did not take delivery on the aircraft until May of 1948.³⁷ The Army Air Force needed an aircraft with the range necessary to overcome denied forward bases and still reach Europe. The Army Air Force desired a 10,000-mile range with a 10,000-pound capacity. The aircraft exceeded by almost 80 percent the desired carrying load, but at reduced distances. In fact, the anticipated range during production was 3,000 miles and failed to meet the requirements for transoceanic bombing of the Soviet Union. Vibration and propeller problems hindered the production of the aircraft in large quantities.³⁸ The workhorse of Strategic Air Command until jet aircraft and refinement of aerial refueling developed; the B-36 found itself the centerpiece of the dramatic argument between the Air Force and the Navy, described in the following paragraphs.

³⁶National Museum of the U.S. Air Force, "U.S. Air Force Fact Sheet, Douglas A-26C," U.S. Air Force, http://www.nationalmuseum.af.mil/factsheets/factsheet_print.asp?fsID=3061&page=1 (accessed 10 February 2014).

³⁷Mandales, 60.

³⁸Hanson W. Baldwin, "Problem of the B-36, Largest of the World's Combat Planes Cannot Be Mass Produced, Experts Say," *New York Times*, 10 July 1947.

The Air Force and Navy, with influence of the secretaries in the Department of Defense, argued throughout most of the latter half of the 1940s as to who owned the capabilities to deliver the atomic weapons of the day. This argument would culminate in the Revolt of the Admirals³⁹ The argument centered around two technology derivations of each services' capabilities, the supercarrier CVB-58 USS *United States* for the Navy and the B-36 Peacemaker bomber for the Air Force. Design of both of these devices happened during the latter years of World War II, but designs changed after the war to accommodate nuclear weapon delivery. The Air Force and its proponents argued the atomic bomb changed warfare to the point that naval aviation was not required and that the bomb would decide all future wars. The Navy and its proponents argued that the Navy was clearly the ideal service, with its forward deployed assets not constrained by land locked airfields, to employ the device. The Air Force had strong advocates in the Secretary of Defense Louis A. Johnson and Secretary of Air Force Stuart Symington to push the B-36 agenda. Chief of Naval Operations Admiral Louis E. Denfield, and the Secretary of the Navy John L. Sullivan strongly advanced the Navy view. The argument over the funding for each service' platform reached a boiling point soon after 18 February 1949, the day the Navy laid the keel of the USS *United States*.³⁹

On 23 April of the same year, the Secretary Johnson unilaterally cancelled the construction contracts for the carrier. Secretary of the Navy Sullivan resigned immediately upon the announcement.⁴⁰ Immediately, an assessment of the B-36 and the

³⁹Richard P. Hallion, *The Naval Air War In Korea* (Baltimore, MD: The Nautical and Aviation Publishing Company, 1986), 13-14.

⁴⁰Jeffrey G. Barlow, *Revolt of the Admirals: The Fight for Naval Aviation, 1945-1950* (Washington, DC: Naval Historical Society, 2012).

United States occurred with a review by the House Armed Services Committee, chaired by Representative Carl Vinson. The Navy, through a memorandum produced by Navy Undersecretary Dan Kimball, alleged that the B-36 was not only an inadequate platform for transcontinental delivery of atomic weapons, but that its championing by the Secretary of Defense Johnson was due to the manufacturer, Convair contributing \$65 million to the Democratic party and Johnson's former employment as director of Convair.⁴¹ Admiral Denfield remained silent during these times, and delegated oversight of the Navy contribution to the House review to, then, Captain Arleigh Burke. This raised suspicion within the Navy leadership as to Denfield's allegiances and support of the naval flyers (Denfield was a destroyer, cruiser, and submarine commander and relied upon the Deputy Chief of Naval Operations for Air, Vice Admiral Arthur W. Rutherford, to provide information with regard to naval aviation). Navy admirals criticized the capabilities of the B-36 and advocated (when being practical) a balanced approach to national security with Air Force long-range bombers and large aircraft carriers. After days of this testimony on the House floor, Admiral Denfield testified that he fully supported the preceding testimony on 8 October 1949. Other than Denfield leaving as the Chief of Naval Operations, no other actions occurred with regard to the Admirals revolt. The new Chief of Naval Operations, Admiral Forrest Sherman, would smooth over relations between the Navy and the Air Force. The advent of the Korean War highlighted

⁴¹Daniel Ford, "B-36: Bomber at the Crossroads," *Smithsonian Air and Space Magazine* (April 1996), <http://www.airspacemag.com/history-of-flight/b-36-bomber-at-the-crossroads-134062323/?no-ist> (accessed 4 March 2014).

the inadequacies of the B-36, and the design of the USS *United States* became the CVA-59 USS *Forrestal*.⁴²

Politics between the Air Force and Navy did not completely overshadow developments in combat aircraft. Scientific research and analysis of German engineering brought to the United States after World War II provided significant insight to the design of faster aircraft.⁴³ The swept wing plan form allowed faster aircraft without having to increase engine thrust. The United States Air Force's first bomber to implement this technology occurred in the Boeing B-47 Stratojet. First flown in 1947 and delivered to the Air Force in 1950, the size of the aircraft dwarfed most bombers of World War II, and outpaced bombers that were available between 1947 and 1953. As a comparison, the Stratojet's wingspan measured at 116 feet and the Invader reached a mere 70-foot wingspan. The B-29 Superfortress had a larger wingspan, with a comparable internal bomb carrying capacity, but with a maximum speed of just over 350 miles per hour, the aircraft could not keep pace with the 606 miles per hour of the Stratojet. The internal load of bombs up to 20,000 pounds exceeded the maximum 4,000 pounds carrying capability of the Invader. The Stratojet demonstrated the bombing specifications desired of the Air Force. Large carrying capacity at great speeds theoretically allowed the Air Force to arrive unescorted over targets with enough evasive maneuverability to successfully destroy the enemy.

⁴²Hallion, 21-23.

⁴³Mark Lowell, *The U.S. Combat Aircraft Industry: 1909-2000* (Santa Monica, CA: Rand, 2003), 65.

The B-52 Stratofortress did not come to the Air Force until after 1953; however, the design requirements and specifications are indicative of the Air Force's vision of future war. Requested in November of 1945, the then Army Air Force sought an aircraft with a 5,000-mile radius, operated at 300 miles per hour, and could carry a 10,000-pound bomb load at upwards of 43,000 feet.⁴⁴ The original design called for straight winged turboprop aircraft. After multiple model changes, induced by the Soviet Union's increased air defense capabilities and the United States Navy's proof of concept in a swept wing jet engine plane that out performed all variants of the time of the B-52 model, the Air Force introduced jet propulsion with a swept wing body. This advent increased the range, altitude, and carrying capacity of the aircraft that assisted in solidifying the Air Force's role in the strategic planning.

⁴⁴Mandels, 60.

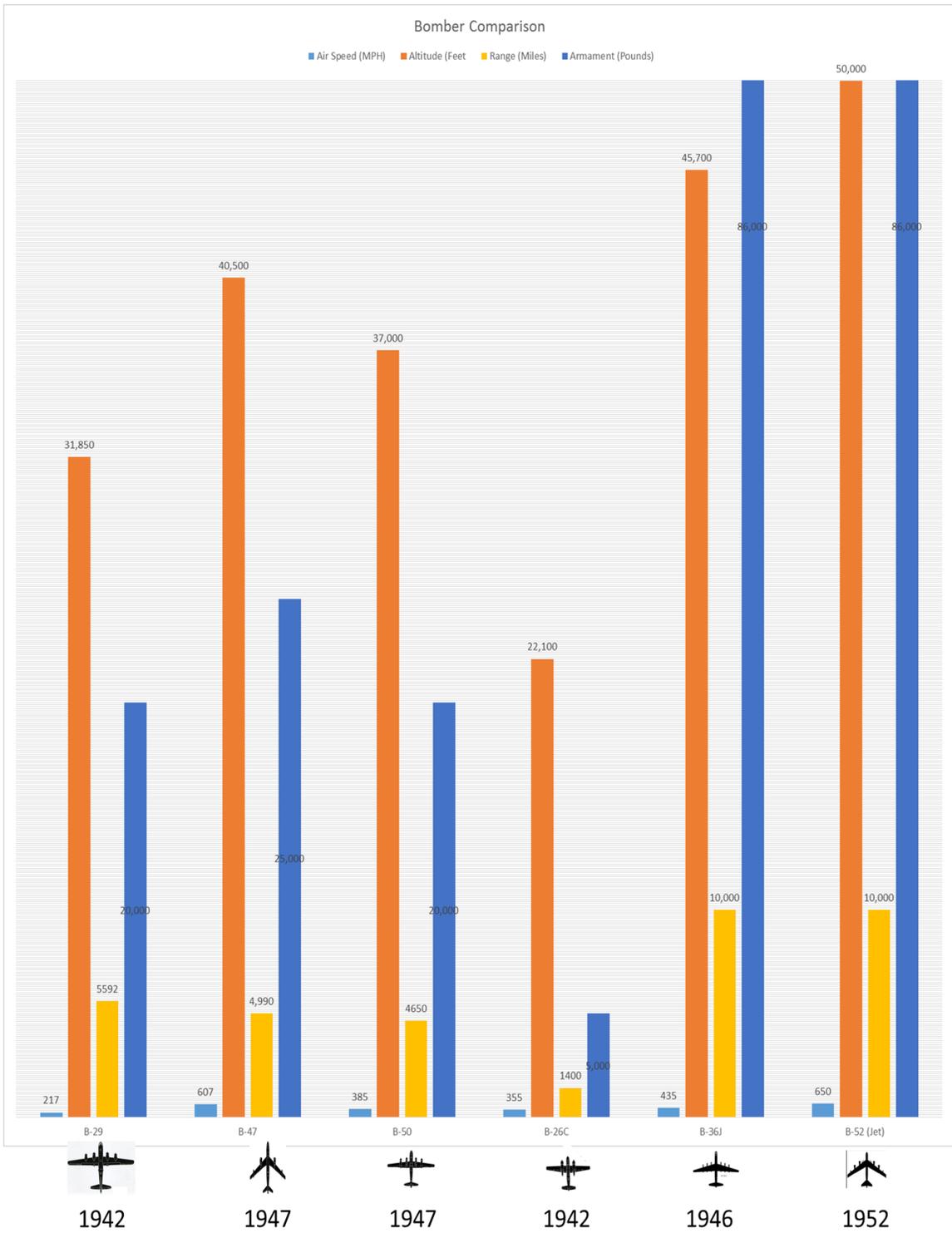


Figure 1. Comparison of Bomber Capabilities

Source: Created by author.

The United States Army Air Force flew the Lockheed F-80 Shooting Star in 1944 as the first jet powered combat aircraft in the American arsenal, but the late time in production prevented combat use. The Shooting Star exceeded 500 miles per hour, the first time aircraft exceeded this previous limit. The Air Force planned the F-80, designed with a straight wing frame, to conduct missions as an interceptor. Armed with six machine guns and capable of carrying eight 5-inch rockets or 2,000 pounds of bombs, the Air Force produced this aircraft through the late 1940s and ended production in 1953.

Building up to the advanced F-86 Sabre, the Air Force obtained the F-84 Thunderjet from Lockheed. Obtained in February 1946, prior to the swept wing technology that would encompass the jet fighters, the F-84 had a straight wing frame. Lessons from World War II proved the bomber incapable of penetrating into enemy territory and conduct bombing missions without the fighter attack aircraft. The Thunderjet design encompassed this concept and provided the Air Force with a fast, agile aircraft capable of conducting defensive counter air for the bombers. The F-84 became the baseline aircraft for the Thunderstreak and the Thunderflash and encompassed swept wing frames. Production lasted until 1953, and played a role in the Korean War effort. After the war, research and development with the Thunderjet occurred, specifically power plants and aerodynamic testing.⁴⁵

The height of innovation of subsonic tactical jet aircraft occurred between 1947 and 1953. The most notable jet aircraft of the Korean War, the F-86 SABRE, first flown in 1947 (as the XF-86), utilized the swept back wing form for the first time. Delivered in

⁴⁵National Museum of the Air Force, "Republic F-84E Thunderjet," U.S. Air Force, <http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=293> (accessed 18 February 2014).

1950, the aircraft broke land speed records, and exceeded Mach one for the first time by North American test pilot George Welch. The F-86 flew missions designed to destroy enemy aircraft in the air and on the ground in daylight operations. The SABRE operated at rated speeds of 650 miles per hour by design, subsonic speed, but not unaccustomed to exceeding the sound barrier for short periods.⁴⁶ Though the aircraft was on par with the Soviet MiG-15 counterpart, the United States did not establish an asymmetric advantage over the Soviets until they developed supersonic jet aircraft. This transformation would not occur until the late 1950s into the 1960s.⁴⁷

The Air Force designed, contracted, and produced combat aircraft with two purposes: deliver bombs on targets deep in the enemy's rear lines with little to no escort, and meet the enemy in the air to protect airfields and bombers while outmaneuvering the opponent. This is evident in the increased speeds, operating altitudes, and load capacities of the aircraft. Additionally, this meets the aspects of Douhet's theory on airpower. During World War II, Douhet's theory never came to fruition because of the counter air tactics of the enemy and the mass numbers of aircraft required inflicting the desired damage. However, the dropping of a single atomic bomb to destroy an entire city led Air Force leaders to believe that the theory had finally become reality. With advanced aircraft weaponry and designs, destruction of the enemy's centers of gravity seemed possible. The Air Force misunderstood the impact of the potential use of nuclear weapons on the conduct of future wars; they would be limited by the weapon rather than unlimited.

⁴⁶Boeing, "The F-86 Sabre Jet," <http://www.boeing.com/boeing/history/bna/f86.page> (accessed 11 February 2014).

⁴⁷Lowell, 65.

The Navy had two strategic arguments after World War II of the roles and missions of the air component of the Navy, one internal to the Navy and one external to it. The internal conflict revolved around the place of combat aircraft within the Navy structure. World War II had demonstrated the immense power of the aircraft carrier and how carrier aviation now dominated the sea battle. The internal institutional dialogue between the “battleship captains” and naval aviators in the period between World War I and II provided the baseline for arguments as to the correct doctrine to advance sea power.⁴⁸

Conflict with the Air Force superseded this argument, since the Navy tied funding to aircraft with the capability to deliver atomic weapons and still conduct maritime and amphibious operations. Initially, some leaders in the Navy considered the atomic weapon to be immoral, but upon recognition that the national security strategy relied upon this technology, the Navy incorporated plans to become involved in the capability.⁴⁹ Additionally, the Navy argued that power projection from the sea, utilizing larger aircraft armed with atomic weapons, provided the United States with the ability to strike anywhere in the world without the use of land bases.⁵⁰ This concept dictated much of the aircraft changes in the Navy, and reduced funding due to money sent to the creation of bombers of the Air Force for strategic bombing greatly influenced Navy concepts.

⁴⁸Winnefeld and Johnson, 9.

⁴⁹Frank Uhlig, Jr., *How Navies Fight. The U.S. Navy and Its Allies* (Annapolis, MD: United States Naval Institute, 1994), 286.

⁵⁰Barlow, Kindle edition 919.

In the years after World War II, the United States Navy found itself in a severe gutting of vessels, aircraft, and personnel. Not unlike the other service departments, the Navy struggled to find a happy medium to maintain an overseas presence while still falling under the \$15 million dollar cap imposed by the President. However, initial investments required for upgrades and production pronounced the Navy's problems because these investments had always been greater than the other services. To maintain the reduced funding available, the Navy chose to maintain a force that was capable of supporting fleets in the Eastern Atlantic, Western Pacific, and, in 1946, the Mediterranean.⁵¹

The Navy utilized proven aircraft from World War II to accomplish this, such as the F4U Corsair, the F6F Hellcat, the F7F Tigercat, and the A-1 Skyraider. This decision came partly due to the Navy's inability to mass produce aircraft carriers that could support unproved jet aircraft based upon the shorter landing platform. In fiscal year 1949, the Navy utilized increased appropriations provided, based upon Presidential and Congressional studies in 1948, to increase its standing aircraft force. In order to meet the intent of the money provided for increased aircraft, the Navy brought out of "mothball" status 10,687 various aircraft upgraded and placed in service.⁵² This is an important note in the actions of the Navy. Though the first operational jet launched off an aircraft carrier

⁵¹Francis P. Matthews, "Semiannual Report of the Secretary of the Navy, July 1–December 31, 1949," in *Semiannual Report of the Secretary of Defense and the Semi Annual Reports of the Secretary of Army, Secretary of Navy, Secretary of the Air Force July 1 –December 31 1949* (Washington, DC: Government Printing Office, 1950), 169.

⁵²David Nolan, "Panthers At Sea," *Military Aviation Air and Space Magazine*, (June 2013): 169, [http://www. Airspacemag.com/military-aviation/panthers-at-sea-69666178/?no-ist](http://www.Airspacemag.com/military-aviation/panthers-at-sea-69666178/?no-ist) (accessed 3 March 2014).

in 1947, there was inadequate time, money, and sea going platforms to fully develop air groups and squadrons into purely jet aircraft, unlike the Air Force's ability to use longer runways on land based airfields.⁵³

The Navy was slow on incorporating unproven jet technology into the fleet because of the hazards associated with landing on an aircraft carrier with a shorter runway than land based runways. There was not much room for error in design, landing execution, or ship positioning when it came to conducting flight operations. Additionally, the increased landing approach speeds of jet aircraft provided increased dangers for aircraft carrier operations, especially to the smaller carrier designs of the time (the angled deck carrier not conceived by the British, or built by the Americans at this time). Propeller driven aircraft, with their much slower speeds and reactive steerability, had proven themselves a better fit for the naval operations. The A-1 Skyraider was an example of the Navy's aircraft philosophy of the time. Delivered in 1946, the Skyraider provided a one of a kind capability to deliver eight thousand pound bombs with precision accuracy, but at speeds just over 300 miles per hour.⁵⁴ The A-1 was a single seat, straight wing, propeller driven aircraft designed in 1944 as a carrier based, long-range, dive bomber/torpedo carrier.⁵⁵ This aircraft was significant to the combat effectiveness of the naval airpower due to its ability to carry a myriad of weapons against as a variety of target types.

⁵³U.S. Department of Defense, *First Report of the Secretary of Defense, 1948*, 66.

⁵⁴Boeing, "AD/A-1 Skyraier Attack Bomber," <http://www.boeing.com/boeing/history/mdc/skyraider.page> (accessed 4 March 2014).

⁵⁵Naval History and Heritage, NAVAER-1335, REV 1-55, "Standard Aircraft Characteristics AD-4 'Skyraider,'" Douglas Corporation, 30 June 1957.

The Navy, in coordination with its long time contracting companies Douglas and Grumman, tackled research and development in jet technology as they realized the jet, as well as atomic bombs and missiles, were the wave of the future. The speed capability would be beneficial in air combat operations, though difficult in launching and recovering the aircraft in the maritime domain. The first jet aircraft, a prototype, launched and trapped from an aircraft carrier, the McDonnell FD-1 Phantom, occurred on 21 July 1946. Production of the aircraft occurred in limited numbers and initially provided a jet familiarization platform. The aircraft provided no increased combat effectiveness, nor aeronautical capabilities, but it introduced into the Navy the jet age.⁵⁶ Armament for the Phantom included four 50-caliber machine guns in the nose section and the Navy designed it as a daylight fighter. The Navy and Marine Corps called for production of 60 aircraft. These aircraft made the first jet squadron, VF-17A, and after conducting 176 takeoffs, landings, and training maneuvers in May 1948, the Navy proved their capability to utilize jet aircraft from aircraft carriers. The Phantom saw combat in Korea, but the Navy considered it obsolete after 1954, due to improvements in swept wing performance and engine capabilities, and decommissioned that same year.⁵⁷

The Gruman F9F Panther was the first jet aircraft produced by Gruman, a long time supplier of innovative aircraft to the Navy. The aircraft provided the Navy with a reliable and stable platform for combat operations.⁵⁸ The initial designs for the F9F

⁵⁶Hallion, 6.

⁵⁷National Air and Space Museum, "McDonnell FH-1 Phantom I," Smithsonian Institution, http://airandspace.si.edu/collections/artifact.cfm?object=nasm_A19600130000 (accessed 22 February 2014).

⁵⁸Nolan.

Panther began in 1946, but inadequacies of American produced engines delayed delivery of the prototype for the aircraft. The first design utilized four engines, each producing a mere 1,500 pounds of thrust.⁵⁹ In order to overcome the clutter of this design, John Karanik (Grumman's propulsion chief) conducted research in England and discovered a 5,000-pound thrust engine in the Rolls-Royce Nene engine.⁶⁰ The Nene solved two problems for Grumman and the Navy. The aircraft was now powerful and reliable enough to conduct flight operations over open water, while giving a single engine to open up space on the body to add armament.⁶¹ Other than the engines, the innovation of the aircraft was modest. The Panther maintained a common Grumman straight wing design with a rugged body.⁶² This proved ideal for utilization during the Korean War, but like many of the jet aircraft of the time, made the Panther obsolete as the Navy discovered more innovative aircraft.

With little deviation, the United States Marine Corps pursued aircraft the Navy pursued. Between 1945 and 1953, the Marines found themselves in an all too common place in which the service worked to validate its purpose in order to prevent being incorporated into the Army. The reduction of economic resources and the advent of the United States Air Force, with its potential to absorb Marine aircraft under one service, further complicated the Marines viability within the military organization. As far as

⁵⁹Earl Swinhart, "Grumman F9F Panther," The Aviation History Online Museum, <http://www.aviation-history.com/grumman/f9f.html> (accessed 3 March 2014).

⁶⁰Nolan.

⁶¹Ibid.

⁶²Ibid.

combat airpower, the Marines fell into the conversation about the utility of tactical aircraft, and because the vast majority of debate between the services, mainly the Air Force and Navy, was about the strategic bomber, the Marines did not have a clear voice among military leaders. Though interested in exploring and researching jet aircraft, the Marines put most money and effort toward established and proven propeller driven aircraft in conjunction with the Navy tactical aircraft in order to meet fiscal constraints and improve assault doctrine.⁶³

The Navy, Marines, and Army introduced helicopters into their organizations by 1950.⁶⁴ The majority of the aircraft designed incorporated personnel transport, rescue, and hospital delivery but not combat operations. The exploration of combat helicopter tactics occurred late in the 1950s and into the 1960s.

In summary, the time between the end of the Second World War and the start of the Korean War encompassed changes to aircraft centered on the arguments of employment of the atomic bomb. Faster, more efficient, and bigger payload of armament was a central theme to the design of aircraft during this time. Advocates of jet aircraft (mainly from the Air Force) were able to produce because the funding was available to them. As the United States perceived threats in the world, the service that could deliver on the promise of atomic strike capability received priority. These aircraft were the bombers, and received the majority of the technological advancements. Tactical aircraft, though considered important to the protection of long-range bombers, lacked a strong voice from any service and improved at a slower pace than the bomber. The Korean War

⁶³Hallion, 11-16.

⁶⁴Ibid., 11-12.

put these aircraft designs, concepts, and theories to test, but in a limited war context not envisioned by leaders and designers of aircraft.

CHAPTER 5

COMBAT AIRCRAFT IN KOREAN WAR

The Korean War began on 25 June 1950 when the Communist North Koreans invaded south of latitude 38, commonly known as the 38th parallel.⁶⁵ The United Nations Security Council, without the communist Soviet Union, voted to provide military support to South Korea after this belligerent act. The United States was not prepared to intervene in the war in Korea. The United States military trained, equipped, and organized for an unlimited nuclear war. Instead, a limited non-nuclear war developed and aircraft designs found difficulties in providing war-ending results. Restrictive budgets, interservice rivalries, social desires to avoid the devastation of another world war, combined with theories of the atomic bomb changed warfare to the point that leaders believed bombers would decide world conflicts to such an extent that their lean budgets elsewhere resulted in an untrained and ill-equipped military.⁶⁶

Four distinct phases simplify the events of the Korean War. The first phase was the North Korean Forces overwhelming of Allied forces, namely South Korea and the United States, and the holding of the Allied forces at the Pusan perimeter from 25 June until mid-September 1950. The second phase was the execution of General Douglas MacArthur's Operation Chromite in September 1950 and the breakout of the Army's

⁶⁵The attack across the 38th parallel was not the only operation occurring on 25 June, as the North Koreans also sent a steamer to the south, allegedly bound for Pusan carrying 600 North Korean soldiers. The ship was sunk by the South Korean submarine chaser *Bak Du San*. This initial success, or luck, maintained Pusan in the hands of the South Koreans allowing a location for the American forces to land in order to support. See also Uhlig, 291.

⁶⁶Uhlig, 291-292.

Eighth Army from the Pusan perimeter to the Yalu River. The third phase involved the communist Chinese intervention and retreat of the Allies south of the 38th Parallel. The final phase was the establishment of stalemate lines near the 38th parallel followed by a cease-fire agreement by both sides.

Combat aircraft design focused on conducting unlimited war against a nuclear capable threat. The Korean War introduced a limited war with the potential for nuclear intervention by the USSR. The first months of 1950 and the interdiction operations conducted throughout demonstrate the strengths and weaknesses of modern air power in the early era of limited war. They also emphasized and highlighted the factors that influenced aircraft design in the years preceding United States commitment of combat aircraft to the conflict.

The Republic of Korea (ROK) Air Force failed to equip itself to fight in major combat operations in June 1950, and the United States' policy can be blamed for this situation. Composed of 60 trainer aircraft, the South Koreans faced a foe that possessed 132 combat aircraft. MacArthur rejected a plan to provide almost 100 aircraft, including 25 of the illustrious F-51 Mustang fighter-bombers, citing the potential increase in the existent tension between the North and South, and United States fear of a South Korean attack on North Korea.⁶⁷

While the Americans limited their support to the ROK, the Soviet Union provided aircraft (the Yakovlev Yak-9P propeller driven fighter plane) and instructors, specially selected from squadrons that had honorably and effectively served in World War II, to

⁶⁷Robert Jackson, *Air War Over Korea* (New York: Charles Scribner's Sons, 1973), 12-14.

teach combat air tactics to the North Korean Air Force (NKAF).⁶⁸ This difference in support between the two Koreas allowed the North to gain air superiority over the ROK in the opening months of the Korean War. Launching the full force of its air force in its initial assault, North Korea demonstrated not that it was a superior air force, but that South Korea had nothing to counter. Yak-9s had free reign to attack Seoul, and more specifically Kimpo airfield. The ROK Army was not as concerned with the presence of North Korean fighter aircraft as they were with the Soviet T-34 tanks rolling through Seoul. The defense of South Korean air fell to the United States' Far East Air Forces (FEAF), and that organization did not prepare or posture itself to expeditiously aid with maximum support the forces in Korea in large part due to the pre-war factors outlined in chapters 2 through 4.⁶⁹

⁶⁸Matthew B. Ridgeway, *The Korean War* (Garden City, NY: Da Capo Press, 1967), 9.

⁶⁹Clay Blair, *The Forgotten War, America in Korea 1950-1953* (New York: Doubleday, 1987), 60-61.

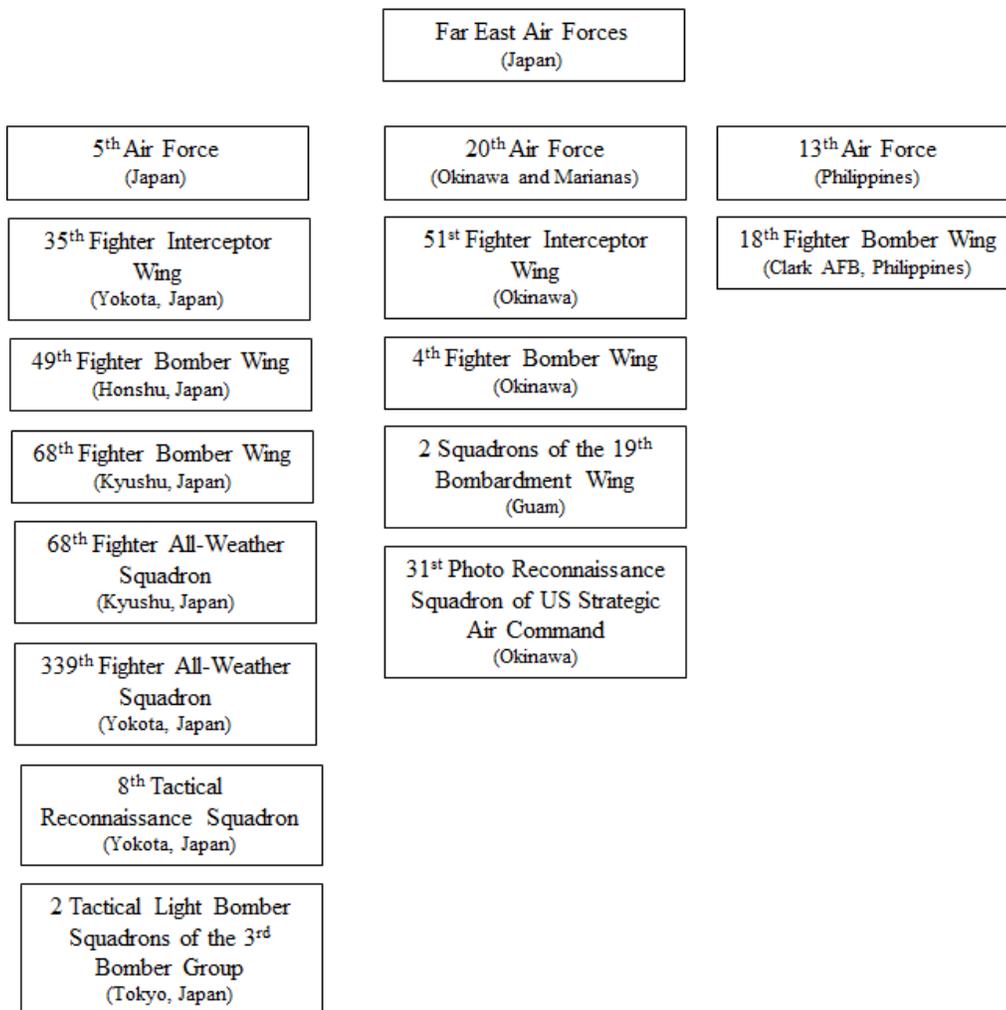


Figure 2. Organizational Chart of FEAF, 1950

Source: Robert Jackson, *Air War Over Korea* (New York: Charles Scribner's Sons, 1973).

American combat airpower distributed throughout the world, like any other combat component in the United States arsenal, had largely focused toward Europe and training in the United States to that end. A relic of World War II, the FEAF provided air power to the Far East region. Prior to the outbreak of the Korean War in 1950, the Fifth Air Force, the Twentieth Air Force, and the Thirteenth Air Force composed FEAF. Fifth

Air Force had responsibility of air defense in East Asia, and its mission encompassed potential air threats from the Soviet Union with its wings and squadrons stationed in an arc on the Japanese Islands.⁷⁰ This made sense as a defensive measure against an incoming attack from the Soviet Union, but Korea required Fifth Air Force to project air power over unplanned for distances and became a significant issue. This example highlights how operational and strategic context for local defense impacted combat aircraft requirements and tactics.

⁷⁰General Otto P. Wayland, "The Air Campaign in Korea," in *Airpower, The Decisive Force in Korea*, ed Colonel James T. Stewart (Princeton, NJ: D Van Nostrand Company, Inc., 1957), 6.

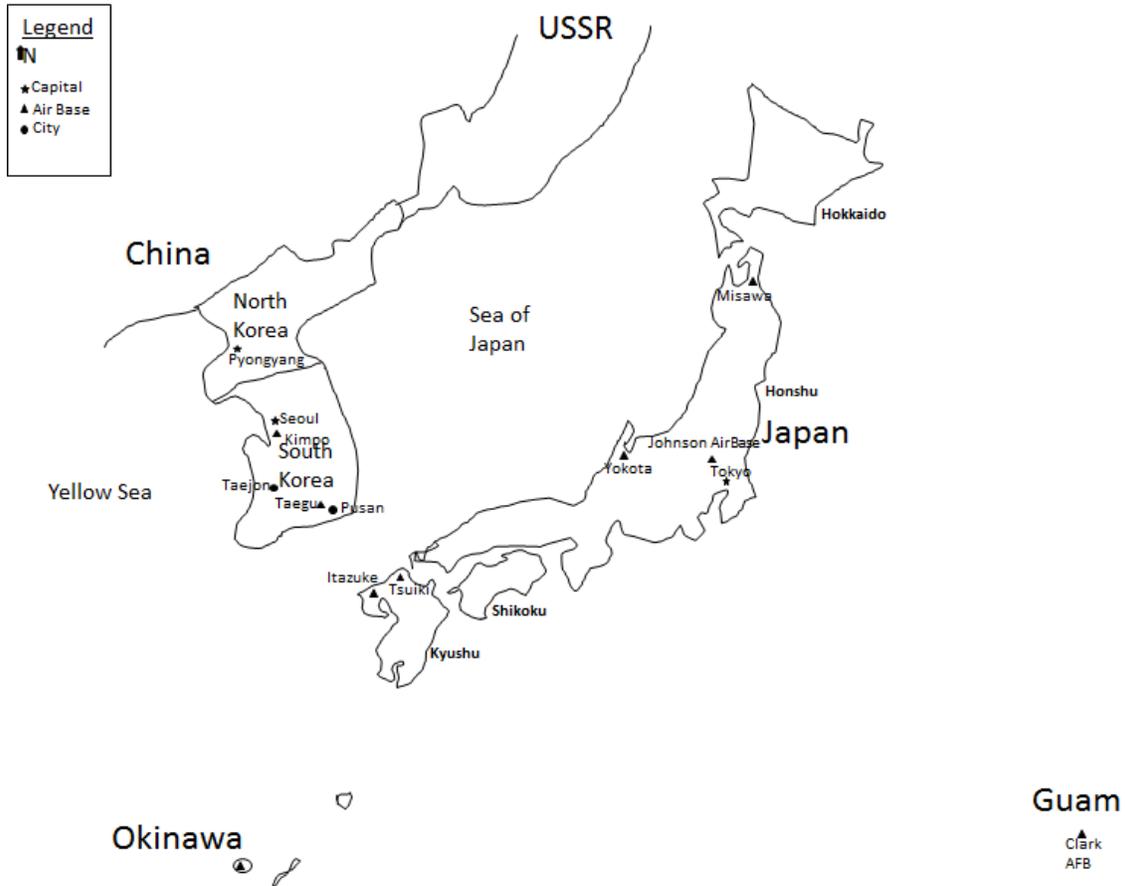


Figure 3. Map of East Asian Air Basing

Source: Wanderlust, “Japan/Korea Maps,” <http://www.wanderlustore.com/Japan-Korea-Maps> (accessed 7 May 2014).

In all, there were 1,176 aircraft available in FEAF’s arsenal, only one medium, one light bomber wing, and eight fighter squadrons were flying over Korea, while 10 fighter squadrons remained in Japan to provide air defense for Japan, Okinawa, and the Philippines.⁷¹ For one way distances, the aircraft travelled as far as 738 miles from Yokota, Japan, and as close as 346 miles from Kyushu, Japan. Typical flight times for a

⁷¹Wayland, 6.

B-29 Superfortress leaving Yokota, Japan was 15 hours.⁷² Not as significant an issue for the propeller driven F-82 Twin Mustangs, the distances considerably limited the utility of the jet powered F-80 Shooting Stars of the 35th Fighter Interceptor Wing (Yokota, Japan) and the 51st Fighter Interceptor Wing (Okinawa). The jet engines were fuel inefficient compared to the propeller driven aircraft and could not remain over the skies of Korea long enough to conduct more than one engagement with the enemy, whether dog fighting or close air support.⁷³ Designers and contractors did not solve efficiency issues in the jet aircraft during the interwar years, and the Air Force leadership failed to organize and recognize that forward basing of jet aircraft to the point of conflict was as important as having the faster platforms capable of delivering munitions.

The operational structure of MacArthur's command and his assessments of the enemy unnecessarily delayed operational fixes to the issues by FEAF. Major General Earle E. Partridge, Commander of Fifth Air Force, ordered aircraft to conduct the civilian evacuation mission on short notice. However, MacArthur had to authorize military action. In a briefing to John Foster Dulles, a special representative to Secretary of State Dean Acheson, MacArthur mistakenly believed the attacks by North Korea were not an all-out effort to subjugate South Korea and that the ROK would handily defeat the North.⁷⁴ MacArthur ordered Fifth Air Force to support the evacuation by Norwegian

⁷²Rear Admiral Arleigh Burke, U.S Navy, "Burke Speaks Out On Korea," *Proceedings Magazine* 126, no. 167 (May 2000): 68-72.

⁷³Colonel Charles G. Teschner, "The Fighter-Bomber in Korea in *Airpower, The Decisive Force in Korea*, ed. Colonel James T. Stewart (Princeton, NJ: D. Van Nostrand Company, Inc., 1957), 108.

⁷⁴Blair, 73; This was contrary to a briefing General MacArthur's G2, Major General Charles Willoughby, had given to the Joint Chiefs of Staff in the Pentagon.

freighters of 2,000 American civilians from Seoul via Inchon on 26 June, but they were not to overfly the mainland and could not attack North Korean forces unless they were threatening the ships directly.

This required a rethink about the air combat power needed to support these operations, since the distances from Japan to the west side of the peninsula exceeded the operational combat range of most the aircraft assigned in the region. The F-82 Twin Mustang provided the necessary endurance; however, there were only 12 available from the 68th Fighter-Bomber Wing. In order to maintain the required combat power and endurance for patrol operations, the 338th Fighter All-Weather Squadron and the Twentieth Air Force moved their F-82s to Itazuke, Japan.⁷⁵ The jet engine was incapable of supporting long-range missions and attacks without a fueling stop close to the fight. The reliable fighter planes of World War II provided the necessary endurance, supporting long transits, and troop support. Their speed and armament, dwarfed by their jet adversaries, were adequate for the limited ground war in Korea but did not meet the Air Force's vision of defeating the enemy's air forces and bombing the enemy to force surrender of forces. The jet aircraft designed in the late 1940s intended to meet the Air Force's vision, but fuel consumption and lack of forward basing prevented attempts to prove this vision.

On 27 June, MacArthur approved the airlift of civilians from Seoul. F-82 Twin Mustangs provided air cover for the evacuation. The previous day there was only one instance of NKAF interference of the sea evacuation through Inchon, and it was a minor event as the Soviet made Yak-9 made a diving maneuver on a group of F-82s then flew

⁷⁵Jackson, 13-15.

away. However, during the air evacuation from Kimp'o airfield in Seoul, F-82s and F-80s patrolling the area defeated two attempts by the NKAF to bomb the airfield. The Allied aircraft destroyed seven of the thirteen North Korean aircraft engaged in the bombing attempts in one-sided dogfights.⁷⁶ As stated before, the NKAF demonstrated their superiority over the South Koreans in the air. The severely outmatched propeller driven aircraft they possessed proved inferior to the performance of the F-82s. The design of the jet fighter, with its faster speeds, higher capable altitudes, and smaller turning radiuses provided an advantage over the NKAF. This advantage greatly assisted the unprepared United States Air Force in overcoming tactical combat training failures.

MacArthur received word that the United Nations Security Council approved the resolution to provide support to South Korea, and he directed Partridge to attack enemy armor, artillery, convoys, supply dumps, bridges, and troop concentrations south of the 38th parallel, opening the first of four interdiction operations occurring during the war.⁷⁷ Early on 28 June, the Fifth Air Force went to work. F-80 and F-82 fighter-bombers conducted armed reconnaissance missions, attacking columns of enemy supplies, equipment, and personnel. Though these attacks were successful, in that they destroyed North Korean Army soldiers and equipment, their on-station or target loiter time was limited to minutes due to fuel constraints.⁷⁸ On the same day, 12 B-26s successfully attacked a rail complex at Munsan followed, later in the evening, by four B-29s

⁷⁶Jackson, 13-16.

⁷⁷Robert F. Futrell, *The United States Air Force in Korea 1950-1953* (New York: Duell, Sloan and Pearce, 1961), 30-31.

⁷⁸Teschner, 108.

destroying bridges north of Seoul. The B-26 bombing of Munsan rail was not an uneventful attack. Ground fire damaged all aircraft and one aircraft crashed upon landing in Japan due to the damage sustained, resulting in loss of the crew.⁷⁹ The early bombing operations were successful in destroying most of their targets; however, the cost was high and the immediate effect minimal. Combat air power did not stop the North Korean Army from continuing the attack. Rear Admiral Arleigh Burke, Chief of Staff to Admiral Turner Joy, summed up the early issues of 1950 in stating the need for continuous assessment of the conduct of war from the beginning. Air Force doctrine required review during the war and recognition that bombing effects are not immediate, cannot win the war in total, and are expensive.⁸⁰

As the American combat aircraft demonstrated their capabilities to North Korean soldiers, the NKAF gave the South Koreans and Americans a similar showing. Yak-9s attacked Suwon airfield on 28 and 29 June 1950. Four Yak-9s attempted to attack the airfield while MacArthur's aircraft was landing. The attacking aircraft demonstrated to the commander that the air threat from North Korea was real. The same day, MacArthur gave the green light and General George E. Stratemeyer, the FEAF commander, ordered strikes against North Korean airfields.⁸¹

The Air Force responded to the order by conducting a bombing mission utilizing eighteen B-26s against the North Korean airfield at Pyongyang, destroying 25 enemy aircraft on the ground. Only one Yak-9 made it to the air to defend and an American

⁷⁹Jackson, 16.

⁸⁰Burke, 68-72.

⁸¹Douglas MacArthur, *Reminiscences* (New York: McGraw-Hill, 1964), 377.

fighter-bomber aircraft destroyed it. Other than reconnaissance flights over other airfields north of the 38th parallel, no other Allied bombing occurred until offensive actions began. Instead, diverted bombers, originally bound for airfields throughout the north, supported attacks on convoys and enemy troops found north of the Han River.⁸²

For the Air Force, the interwar period failed to address the initial scenario presented by the Korean War—the necessity to provide air support to soldiers and marines on the ground. As bombers conducted their runs on ground targets attacking the retreating army, fighter-bomber aircraft conducted combat patrols over the battle area. Little in the way of enemy air threats occurred during this time, but the leadership realized an issue with the ability of the jet aircraft to remain on patrol after traversing from Japan.⁸³ The jets needed forward operating airfields on the peninsula to allow flight times and engagement of the enemy on the ground. However, Suwon became unattainable as a forward operating base during the North Korean pursuit south. Taegu and Pohang airfields, located south of the Han River, became the only forward bases available. This limited the number of aircraft forward based on mainland Korea, and resulted in inadequate on-station time for the jets in theater (specifically the F-80 Shooting Star) for the crisis at hand.⁸⁴ The durability, payload, and endurance of the World War II era F-51 Mustang better suited the requirements of interdiction and close air support that the Air Force found itself conducting.⁸⁵ Additionally, the Air National

⁸²Jackson, 19.

⁸³Teschner, 109.

⁸⁴Ibid.

⁸⁵Uhlig, 292.

Guard units activated to support the conflict in Korea could provide parts and maintenance for these aircraft.⁸⁶ As such, FEAF received 154 F-51s off the USS *Boxer* at the end of July 1950.⁸⁷ However, the susceptibility of the aircraft coolant lines and radiator to anti-aircraft fire and small arms made the close support needed during the war a dangerous venture for the pilots conducting these missions.⁸⁸ In addition, the pilots had spent little time, and even less prioritization, on training for close air support.⁸⁹ Designed in the interwar period, the fighter jets and fighter bomber jets intended to defeat incoming enemy aircraft, protect bombers, and release massive amounts of ordnance on fixed strategic targets in the enemy's rear lines. Instead, World War II era aircraft carried the brunt of the work during the defense of Pusan providing air support to ground units as North Korea massed its forces north of the Han River.

By 3 July 1950, the Navy provided Task Force 77, commanded by Vice Admiral Arthur D. Struble, and comprised of American and British vessels, including aircraft carriers. The American ships brought two squadrons of F9F Panther jet fighters, two squadrons with the older propeller F4U Corsairs, and one squadron of the A-1 Skyraider propeller fighter aircraft. The British brought the Fairey Firefly, a propeller anti-submarine aircraft, and Supermarine Seafires, a propeller driven aircraft utilized for air defense and combat air patrols. Prior to setting sail for operations on the Korean peninsula, Vice Admiral Struble met with Vice Admiral Turner Joy, Commander of

⁸⁶Teschner, 109.

⁸⁷Wayland, 7.

⁸⁸Hallion, 40.

⁸⁹Blair, 99.

Naval Forces Far East, General MacArthur, and Lieutenant General Stratemeyer and took on the task of attacking targets in the vicinity of Pyongyang as part of the first deep interdiction operation, to include railroad yard, airfields, and bridges.⁹⁰

The Navy did not waste any time in carrying out this task. Twelve Skyraiders, sixteen Corsairs, and eight jet Panthers attacked and destroyed an airfield at Haeju, and Pyongyang. The launch sequence of these aircraft provides an insight into the operational thinking of the United States Navy. The propeller driven aircraft launched first. The faster jets launched last and passed the propeller fighters routed to the target area. The Corsairs and Skyraiders, heavily armed, provided firepower to the target area and the Panthers conducted offensive counter air operations protecting the attacking aircraft. This first use of naval jet aircraft showed two principles of naval operations. One was that the superior air to air combat performance of the jet not only led to destruction of enemy propeller driven aircraft, but the psychological effects these air combat actions had on the enemy pilots was great enough to prevent their attacking the main air strike.⁹¹

Additionally, the Navy could arm the slower, but more fuel-efficient propeller aircraft with more firepower and heavier bombs while utilizing another component of the air group to provide protection without having to overly account for on station time. Several reasons contribute to the Navy's ability to integrate jet aircraft with the older propeller driven. The limited numbers of jets forced the Navy to operationally plan the jet into the entire construct of their air arsenal. The Navy produced few jets during the interwar years

⁹⁰Allan R. Millett, *Semper Fidelis: The Story of the United States Marine Corps*, in *The Macmillan Wars of the United States* series (New York: Macmillan Publishing Co., 1980), 461.

⁹¹Hallion, 31-35.

as the Navy slowly and methodically developed aircraft carriers and jet aircraft they carried. Additionally, the Key West Agreement of 1948 ensured the Navy and the Marine Corps coordinated and planned for amphibious operations, which leaders inferred required support from seaborne aircraft. This is a distinction from the Air Force, handcuffed in balancing armament weights and effective stay time of their aircraft launching from distant airfields. The Navy could essentially drive its airfields to the most effective locations off the North Korean part of the peninsula because Pyongyang had neither the air nor naval power to prevent or disrupt these maritime power projection operations. Further, North Korean pilots were not trained in overwater navigation or flying. The seaward flanks proved to be bastions for the Navy's aircraft carriers. Unfortunately, at the start of the war, the Navy only had four aircraft carriers in commission and only one of them, when the North Koreans invaded, was in the Western Pacific theater.⁹²

In order to maintain an open port of entry, and stop the southward progress of North Korea, General MacArthur established a new defensive line along the latitude of 36 degrees and focused on protection of the port of Pusan and the airfields at Taegu.⁹³ For the Army, this meant bringing over from Japan portions of the Eighth Army under Task Force Smith, commanded by Colonel Charles B. Smith. The piecemeal execution of this endeavor in many professional opinions contributed to the failures of Task Force Smith and demonstrated a failure to understand the limitations and risks associated with

⁹²George Baer, *One Hundred Years of Sea Power: The U.S. Navy, 1890-1990* (Stanford, CA: Stanford University Press, 1994), 320-332.

⁹³Jackson, 20.

airlifting troops into combat in unknown territory.⁹⁴ For the Army, this would not be the only planning failure and miscue. However, the importance to the utilization of combat aircraft during the Korean War of this initial operation is that it demonstrated a theme that would repeat itself often in the opening months of the conflict: the Army and the Air Force struggled to effectively communicate, coordinate, and prioritize.⁹⁵

The interservice rivalry, as described in chapters 3 and 4 of this thesis, was a significant contributor to the operational and tactical difficulties in the opening months of the Korean War. Each service entered the summer of 1950 with differing understanding of the capabilities required for air combat tactics and operations, and prioritizations of airpower utilization in a non-nuclear scenario.

CAS highlights doctrinal differences between the Navy and the Air Force. CAS is defined as: “Air action against hostile surface targets which are so close to friendly forces as to require detailed integration of each air mission with the fire and movement of those forces.”⁹⁶ The Air Force, partly because of its desire to maintain autonomy, interpreted this definition based upon its priorities of tactical use of aircraft and the lessons the Army Air Force learned in the European Theater during World War II in which aircraft were required to cover several miles of broad front.⁹⁷ The priority for CAS was last for the Air

⁹⁴Blair, 94.

⁹⁵Ibid. The Army and the Navy had similar issues in the conveying of troop equipment and personnel early in the war, but that was due more to previous budget constraints and ship availability than coordination and is not germane to the air combat story.

⁹⁶Secretary of Defense, “U.S. Navy, Commander-in-Chief Pacific Fleet, Interim Evaluation Report No. 1,” 223.

⁹⁷Hallion, 34-35.

Force, following air interdiction then battlefield interdiction.⁹⁸ Additionally, the Air Force doctrinally avoided becoming the artillery for the Army and considered CAS a means to enable artillery. Aircraft operating closer than 1,000 yards was considered excessively dangerous and only to be used in emergencies. The Navy and Marine Corps considered CAS an artillery (or fire support) substitute and employed CAS as a means to attack targets usually within 200 yards of front line troops.⁹⁹

Miscommunication and poor planning between the pilots in the cockpit and the soldiers on the ground directly resulted from the difference in doctrines. When Task Force 77 began providing air support to troops in contact, the pilots launched from the decks of their ships with maps that did not match the maps the troop utilized to coordinate attacks. Therefore, when the pilots could not find the target area given by the Army ground force, they proceeded to look for targets of opportunity in a troop interdiction capacity and failed to provide the much needed close contact aerial support the Americans and South Koreans required.¹⁰⁰ The Air Force in Japan and the Army in Korea also did not train or organize for communicating coordination of strikes, and on at least two occasions found it detrimental to the lives of retreating soldiers as friendly fire incidents occurred during the chaos of the retreat to Pusan. The first notable occurrence on 3 July resulted in more than 200 South Korean troop and civilian deaths as frustrated

⁹⁸War Department, War Department Field Manual 100-20, *Command and Employment of Air Power* (Washington, DC: Government Printing Office, 21 July 1943), Section III, "Tactical Air Force." This reference was revised in August 1946 and re-titled FM 31-35.

⁹⁹Hallion, 42-43.

¹⁰⁰Uhlig, 296.

pilots, looking for targets to support the retreating armies, attacked a South Korean ammo train. A similar event occurred on 10 July, when portions of the American Army's supporting task force retreated from a North Korean T-34 tank attack, and friendly F-80 Shooting Stars that believed they were attacking advancing North Korean troops in the open and mistakenly strafed them with machine gun fire.¹⁰¹

These examples highlight the failures of the Air Force and Navy to prepare in the late 1940s for, and understand, CAS as it presented itself in the early 1950s. CAS had to be conducted utilizing a bottom up concept, in which the ground component fed targeting to the pilots overhead and the pilot responded to strike the requested target. The frontline trooper controlled what he needed to enhance his fighting ability. During the interwar period, neither the Army nor the Air Force trained to this standard. The Navy did to an extent, although it concentrated only on supporting Marines ashore. The results, as discussed above, were detrimental to the soldiers' survival. The Korean War was a ground war and a limited war, due to political directives to not bring Russia directly into the fight and the mountainous, temperamental climate of the country. The Air Force believed winning future wars involved meeting the enemy in the air, defeating them in the air, and striking targets behind enemy lines with the maximum force available to force the enemy to surrender. CAS would not be required, and if it was, it provided time for the Air Force to move bombers and munitions to the fight. The Navy realized it had to support Marines on the ground as the amphibious landings established points of entry into the enemy's country, but the support of the Army would be minimal as artillery and

¹⁰¹Blair, 99-113.

Air Force fighters would keep the Army moving inland. Korea proved that the approach to limited war had to be a joint endeavor, encompassing all facets of air combat.¹⁰²

A directive issued on 15 July 1950 attempted to resolve aircraft coordination control arguments between Admiral Joy and General Stratemeyer.¹⁰³ The Air Force wanted control of all air assets involved in combat operations on the Korean peninsula, the Navy needed to maintain autonomy of its aircraft to ensure self-protection of the aircraft carriers. The underlying issue was a difference in the theorists the services followed. For the Air Force, Giulio Douhet's theory of air power influenced their approach to war. According to this theory, no defense in the air could win a war and the first air force to attack and destroy components of the centers of gravity won. Any aircraft flying was necessary to carry out this action and the Air Force were the professionals most qualified to control the air fight. During World War II, the Army Air Force found the necessity for fighter coverage to ensure bombers arrived at the target. However, with the advent of the atomic bomb, interwar thinking turned toward utilizing all aircraft to move the bomb over the elements of the center of gravity to destroy. The Navy followed the theory of Alfred Thayer Mahan, as modified by experience in World War II, and the air arm of the Navy was required to protect the fleet and sea lines of communication and then provide excess sorties for the fight ashore. Any sorties in excess of defensive counter air enabled ground forces moving from the shoreline inward. Only a naval officer, trained in the maritime environment, was qualified to control aircraft launched

¹⁰²Burke, 68-72.

¹⁰³Winnefeld and Johnson, 42-43.

from aircraft carriers. These theories were incompatible with other, and placed severe strains on the development and implementation of joint doctrine for air operations.

The Air Force interpreted the directive to mean all aircraft flying over Korea were subject to the Commanding General of the FEAF. They sought absolute control of the air war in Korea. The Navy wanted operational control of their aircraft, but were willing to allot sorties in excess of defensive counter air missions for tactical control by the Air Force. They believed the directive applied to sorties it provided to the Air Force, but not to those Navy specific missions assigned to its organic aircraft.¹⁰⁴ This incompatibility of theories and operational control drew the attention of Navy leaders, specifically Admiral Burke. His assessment, not limited to Air Force and Navy differences, concluded that the experiment of limited war provided the Communist details to defeat the American military fighting without a joint doctrine for planning, organizing, and training. Until the American military figured out methods to confront enemies jointly, successes in limited war today could not be guaranteed in similar future conflicts.¹⁰⁵

Operation Chromite, commonly referred to as the landing at Inchon, provides a case study for why this operational control enabled the Navy and Marine Corps air forces, but failed the Air Force and Army idea for control of the war. Chromite cut the North Korean lines of communication and allowed a breakout of the Eighth Army from the Pusan perimeter. The Navy, specifically Task Force 77, controlled combat air during the initial stages of the operation, until the First Marine Division was ashore, and then the Marines Aircraft Group 33 controlled airpower. Tactical Air Control Squadron One

¹⁰⁴Winnefeld and Johnson, 42-43.

¹⁰⁵Burke, 68-72.

established onboard the USS *Mount McKinley*, provided direct control of the Skyraiders and Corsairs in close air support roles and the Panthers provided offensive counter air as well as secondary strikes.¹⁰⁶ The Fifth Air Force, in a supporting role, controlled B-29 Superfortresses to interdict Northern communications and industrial targets.

The morning of 15 September 1950 the assault commenced as Marines landed on the Wolmi-Do Island. Close air support was instrumental in enabling the assault force. Corsairs flew as close as 50 yards in front of the advancing troops, and Skyraiders flew so close to the advancing invasion force that several Marine troop boats were peppered with 20-millimeter shell casings as the aircraft fired into enemy troops defending the city. The timing of the operation occurred exactly as planned, and the continued advance to Seoul and Kimpo airfield continued this precedent. However, the defenses of the North Koreans were formidable enough to cause significant Allied losses. Anti-aircraft flak and larger caliber machine guns from the North Koreans inflicted losses at a higher than anticipated rate. The major contributing factor to the difference in planned versus actual aircraft losses was the necessity to provide slower low flying close air support to advancing Marines as the Soviet T-34 medium tanks wreaked havoc, giving anti-aircraft fires better access to its targets.¹⁰⁷

The Eighth Army and Fifth Air Force did not share Operation Chromite's success of timing in attempting to break out from the Pusan perimeter. Weather was the factor that prevented Fifth Air Force B-29 bombers from making pre-planned bombing runs on troops built up near Waegwan. The delay inhibited Eighth Army's planned timeline,

¹⁰⁶Hallion, 57-60.

¹⁰⁷Ibid., 64-65.

frustrating leaders.¹⁰⁸ The two-day delay did not have any significant consequence for the Eighth Army, because once the Fifth Air Force bombers and fighter-bombers commenced bombing pre-planned targets, the effect on the enemy was immediately discernable. The Air Force's ability to catch North Koreans in the open and bottleneck their retreat by destroying bridges and dropping immense numbers of napalm bombs in the vicinity of crossing sites, allowed Eighth Army to pursue the enemy with limited resistance.¹⁰⁹

Operation Chromite displayed the successful pre-war preparations for amphibious operations by the Navy and Marine Corps. Directives out of the 1948 Key West Agreement forced the Navy to embrace its responsibilities to amphibious landing support. Navy and Marine Corps air squadrons and wings were effective at supporting amphibious landings.¹¹⁰ Chromite also demonstrated that the Air Force, in a supporting role, enhanced the firepower needed for an Army fight. The Air Force did not organize, design aircraft, or train for this role. The Air Force doctrine involved meeting the enemy in the air and bombing to victory. Its leaders eschewed the concept of assuming a supporting role at the conclusion of Operation Chromite. The Air Force continued to support CAS throughout the war, but instituted policies and procedures to ensure it dictated the priority of missions and, as will be shown, focused efforts toward interdiction over CAS.

¹⁰⁸Blair, 99-113.

¹⁰⁹Jackson, 49-51

¹¹⁰James Forrestal, Secretary of Defense Memo, "Functions of the Armed Forces and the Joint Chiefs of Staff," 21 April 1948.

The Air Force argued that Fifth Air Force should have complete coordination control of tactical aircraft, and MacArthur agreed.¹¹¹ This instituted the dawn of the Joint Operations Center (JOC) and in the initial phases of institution worked more like a “functional multi-service center.”¹¹² In practice, a list of air support task requests submitted to the JOC by each of the services provided the input to the orders for all tactical aircraft each day.¹¹³ The Navy provided a liaison officer from Task Force 77 to the JOC. This individual ensured support of the air war with the available sorties provided, and the missions assigned matched the desires of the Task Force 77 commander.¹¹⁴ The Marine Air Wing worked through Task Force 77, Eighth Army, and Fifth Air Force to provide their lists for assignment in support of X Corps. This was a cumbersome process, but was manageable throughout the war.¹¹⁵

The JOC did not become a joint entity until two months prior to the armistice in 1953, when the Navy and Air Force agreed to a permanent staff officer presence on the JOC with the same duties and responsibilities of the Fifth Air Force director within the JOC coordinating maritime air tasking.¹¹⁶ The JOC evolved throughout the course of the war, but it supported the Air Force’s theory of top down operational control by one air

¹¹¹Hallion, 67.

¹¹²Winnefeld and Johnson, 49.

¹¹³Futrell, 213.

¹¹⁴Winnefeld and Johnson, 49.

¹¹⁵Hallion, 67.

¹¹⁶Winnefeld and Johnson, 49.

commander. As long as there was a JOC, the Air Force influenced the conduct of air warfare in a top down method of command throughout the theater of operation.

The Air Force designed and utilized aircraft to bomb deep in the enemy's rear, preferably with nuclear weapons. The B-29 Superfortress carried the fight from Okinawa and Guam early in the war with sufficient payload, fuel, and self-protection to make multiple bombing runs on targets in North Korea. In comparison to the latter two years of the war, 1951 to 1953, the B-29 effectively influenced the war effort from the air in operations such as the 17 and 18 September 1950 bombing of the Naktong bridges. This mission resulted in 1,600 bombs dropped with precision accuracy, trapping the retreating North Koreans. However, subsequent intervention by both the USSR and China provided anti-aircraft firepower, radar interceptors, and enemy fighter jet capability. This prevented execution of bomb runs with accuracy and verification of target damage or destruction.¹¹⁷ The presence of the Soviet-built MiG-15s in the northwest corner of the Korean Peninsula, coupled with improved anti-aircraft defenses around bridges and communications, risked the bombers safety. As a result, all subsequent bomb runs occurred above 20,000 feet and only one run on a given target.¹¹⁸

As a relic of World War II, the B-29 was incapable of overcoming these improvements by the enemy. There were several air battles toward the end of the war to support this contention, for example, one pilot, after surviving a 23 October 1951 entanglement with MiG-15s and anti-aircraft flak remarked, "Those SOB's, they came in so fast we could hardly shoot. What a lousy deal!" The B-29 central fire control system

¹¹⁷Jackson, 130-132.

¹¹⁸Ibid., 99.

could not keep up with the enemy jet to provide accurate shooting.¹¹⁹ Though other bombers had entered service by the time of the war, the numbers were insufficient to support the conflict and simultaneously provide the nuclear deterrence necessitated by the United States against the Soviet Union. Additionally, as General Curtis Lemay stated, the B-29 crews' training and aircraft design prevented successful conduct of night raids. Night bombing was necessary in order to protect them while conducting an economic evaluation of viable targets that were lit up with flares overhead, and then make the bomb run to destroy the target.¹²⁰

Operation Strangle provided further evidence of inadequacies in the bombers' design and utilization in Korea. From May 1951 to March 1952, Operation Strangle intended to destroy the enemy's lines of communication through the rest of North Korea. The plan split the road system into eight routes and targets were any bridge, embankment, choke point, or tunnel and attempted interdict and destroy lines of communication by method of attacking key points on the lines of communication. The Air Force directed attacks in the western portion of the strip, and the Navy, with Marine Corps included, attacked in the northeastern portion.¹²¹ Initial results were promising, as evidenced by left in place Communist supply dumps still intact discovered by Allied forces moving north. However, the ability of the North Koreans to rebuild damaged routes and expeditiously resolve road blockages frustrated operational planners and resulted in a necessity to

¹¹⁹Douglas K. Evans, *Sabre Jets Over Korea: A Firsthand Account* (Blue Ridge Summit, PA: Tab Books Inc., 1984), 102.

¹²⁰Lemay with Kantor, 458-459.

¹²¹Jackson, 102.

attack targets multiple times with different aircraft and ordnance. Operation Strangle failed to permanently sever the lines of communication as the large manpower force and use of off-road movement allowed the North Koreans to operate their logistical train even without the use of key bridges, tunnels, and railways.¹²² Additionally, the Allies were unable to target the sources of Communist supply in the USSR and Manchuria, and the ability of the Communists to house and conceal forward deployed logistics in caves and tunnels that were virtually impenetrable.¹²³

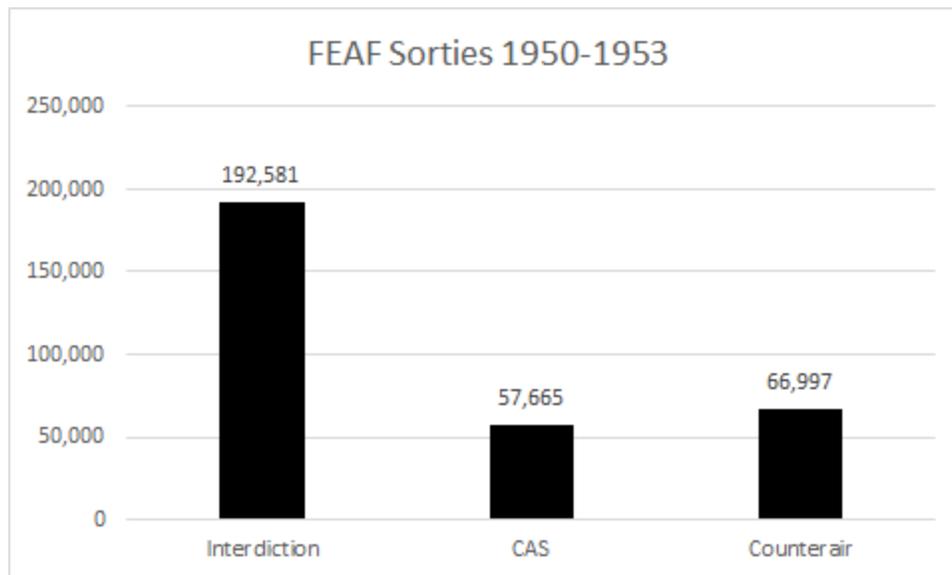


Figure 4. Sorties by Mission

Source: Robert Jackson, *Air War Over Korea* (New York: Charles Scribner's Sons, 1973); Richard P. Hallion, *The Naval Air War in Korea* (Baltimore, MD: The Nautical and Aviation Publishing Company of America, 1986).

¹²²Hallion, 94.

¹²³Jackson, 102.

Figure 4 provides an indicator of the Air Force's unwillingness to comprehend the limited war fought in Korea. Through bombing and interdiction, the Air Force sought victory behind the enemy lines as far as possible. Operation Chromite provided evidence that CAS had done more to enable the progress of the Army and Marine Corps than had interdiction missions. The North Koreans and, later, the Chinese intended to improve their position at the war negotiation table by their fight for position on the ground. Manpower and soldier availability allowed them to overcome lines of communication disruption. The problem for the Allies encompassed stopping masses of troops from overrunning positions, not preventing the sustainment of the enemy forces. The Air Force never embraced this concept, and continued to send aircraft out to destroy lines of communication with minimal success.

The air power commanders failed to provide the promised results. Operation Saturate followed Operation Strangle in February of 1952. The details of the differences between the two operations, both interdiction operations, is not as important as the fact the results were similar; the enemy continued to find work-arounds and to prosecute the war against the south with or without intact roads, bridges, and railways. Improved counter air threats prevented the precision bombing American leaders designed for their aircraft in the interwar period. The enemy did not buckle under pressure from destruction of their lines of communication; instead, they worked around or through it. Allied improvisation failed to match the enemy's. The use of night bombing proved to be difficult, dangerous, and ineffective. The belief in winning the war before the enemy arrived at the front lines proved unattainable.

The American intervention into the Korean War instituted the dawn of the limited modern war in the American memory. The United States prepared for an unlimited nuclear war, with combat airpower poised to meet the threat of the Soviet Union and drop atomic bombs on the way to victory. The planning by air power leaders during the war did not focus on overcoming restrictions implied or directed in conducting limited war. Interdiction and bombing of cities continued to consume Air Force planning efforts. Joint doctrine did not exist, and attempts to compose doctrine on the fly provided a confusing and difficult climate to conduct air operations. The aircraft designed during the late 1940s did not produce the results envisioned at the time, and previously proven aircraft provided the brunt of the workload. Combat airpower in the Korean War did not operate as planned in the interwar period because limited war prevented use as designed.

CHAPTER 6

CONCLUSIONS

Air Force and Navy commanders and decision makers that participated in the Korean air war measured the effectiveness of the air campaign by the effects caused against the North Koreans. The Americans concluded air power kept the United Nations in the war. They also concluded politics and the reluctance to employ the atomic bomb as they had envisioned future wars constrained the ability to win the war outright.¹²⁴ However, looking at the design and planned use of aircraft versus the actual implementation during the Korea War paints a different picture.

Within the context of aircraft design, the two significant services for air power, the Navy and Air Force, demonstrated an inability to match the intended purpose of their aircraft to the requirements of the war in Korea as they unfolded. The Marine Corps air wings contributed and adapted adequately to support the troops on the ground. The Marine Corps discussion with regard to aircraft design and intention closely resembles the Navy, as it utilized the same aircraft, and its doctrine called for a close relationship between the air and ground forces.

The Air Force designs for bombers incorporated the capability to carry nuclear weapons, or a large amount of conventional munitions, long ranges. Strategic destruction and eventual capitulation of the enemy served as the basis for these designs. In theory, the Air Force provided a means to cutoff the North Korean's ability to support the war with industrial capabilities, and they could destroy the means to move troops and supplies

¹²⁴Wayland, 18-20.

during interdiction efforts. Except, the interdiction and bombing campaigns failed to bring a swift end to the war. The reasoning is twofold. First, the timing and location of the war prevented the use of more technologically advanced aircraft like the B-36, B-47, and B-52. Second, the North Korean and Chinese capabilities to restore bridges, roads, and railheads faster than anticipated and not having to rely on industrial manufacturing capabilities on the Korean Peninsula prevented bombers from single handedly allowing the United Nations to outright win the war.

The failures of Operation Strangle and Operation Saturate display the abilities of the Communists to restore or overcome destruction of their lines of communication. Both the Air Force and the Navy utilized multiple bomb drops on railways, roads, bridges, and waterways in an attempt to stop the flow of communist troops and their sustainment trains. However, the use of unconventional methods, by Western standards, and a mass of human workers enabled the Communists to either fix the damaged targets or go around the obstructions. The sophisticated aircraft utilized to evade counter air tactics; release high yielding munitions, and perform awe-inspiring aerial maneuvers could not solve the problem of enemy ingenuity.

The interservice rivalries that festered the working relationship between the services in the interwar years reared themselves to the detriment of conduct of the war. The Navy's desire to remain autonomous, and support only where it fit naval aviation, had a hand in the failures of the interdiction campaigns. This is evident during the months and years that the Air Force operated their jets out of Japan. Due to their fuel consumption, the Air Force fighters could only remain over the Korean Peninsula for a short time. The Navy, on the other hand, launched from off the coast of Korea, had much

longer stay times because they had not burned off as much fuel, and could provide adequate defensive cover for other aircraft equipped to interdict or provide multi-mission (CAS and interdiction) capabilities.

The Air Force's reluctance to commit aircraft to close air support for ground troops both elongated the war, and affected the result of the armistice. The different definitions of each service as to what close air support meant handcuffed the Army. The Air Force failed to recognize that the terrain, enemy, and political climate were not going to support an unlimited war, and the Soldier and Marine on the ground had to be the supported individuals. Post-war writings clearly demonstrate the attitude of the Air Force leaders toward this point and can be summed up in General Otto P. Weyland's article "The Air Campaign in Korea," "in order to be successful, air power must be exploited to the fullest, then the ground forces must support the air forces."¹²⁵

As the services fought for money and government support of their aircraft design and production, each talked about how their aircraft would win the next war. The major focus for the Air Force included adequate carrying capacity to hold nuclear weapons and fly fast enough and high enough to avoid the enemy's air defense capabilities. The Navy focused upon garnering aircraft flown off aircraft carriers, and aircraft carriers capable of supporting faster and heavier aircraft. They argued the Navy could get closer to the enemy and hit earlier with less time for the enemy to respond. During the Korean War, neither was completely correct in their promises. It is true that the United States aircraft managed to defeat the NKAF early in the war, but the war continued for three years and ended in an armistice. The analysis and evaluation of the war as it progressed would have

¹²⁵Wayland, 18-20.

demonstrated that interdiction was not going to defeat the North Koreans, and the Army and Marines had to be the supported force allowing their northerly movement in mountainous terrain with temperament weather.

As the Allies attempted to operate jointly in the air, Air Force leaders created and led the Joint Operations Center. Agreements between the services allowed some functionality early in the war, but the Navy and Air Force read the support and supporting command relationships differently. The Air Force, thinking they had operational control of all aircraft flying over the peninsula, dictated the sortie missions and target lists. The Navy, reading the agreement as to support with any excess sorties, focused on close air support missions, and when no targets found, they searched for interdiction type targets. The evolution of the JOC eventually provided equal footing for all services in Korea, but the joint employment of aircraft continued to be an elusive goal.

The war in Korea was a limited war. The first limited war since the advent of the atomic bomb. The United States learned lessons from the war forgotten by the 1960s in another Asian country. The Korean War demonstrated that the technological advances and superiority of weapons, specifically aircraft in this case, are not all that is required to win the war. The enemy's abilities, no matter how archaic, can overcome the strength of technology. Thorough and unbiased review of strategy, tactics, organization, and operations during the course of war need to verify that the war planned matches the events occurring during the conflict.

GLOSSARY

Speed of sound. Rate of propagation of a pressure pulse of infinitesimal strength through a fluid. This is a thermodynamic property of a fluid.

Subsonic. Air speed travel below the speed of sound.

Supersonic. Air speed travel greater than the speed of sound.

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