Enough Space Control to Rule the Air:

The Recommended Future of the Air Force

BY

Edemumo K. Oboho

A Thesis Presented to the Faculty of

the School of Advanced Air and Space Studies

for completion of graduation requirements

Air University

Maxwell Air Force Base, Alabama

June 2020

DISCLAIMER

The conclusion and opinions expressed in this document are those of the author. They do not reflect the official position of the US Government, Department of Defense, the United States Air Force, or Air University.

ABOUT THE AUTHOR

Lieutenant Colonel Edemumo Oboho is a 2005 graduate of the USAF Academy, where he majored in aeronautical engineering. His Air Force career has included one operation assignment as a pilot in the F-15C Eagle, one operational assignment as an instructor in the F-15E Strike Eagle, and an instructor tour in the T-38C at Euro-NATO Joint Jet Pilot Training at Sheppard Air Force Base, Wichita Falls, Texas. His next assignment will be in San Antonio, TX as an Air Education and Training Command strategist.

ACKNOWLEDGMENTS

I am grateful to my thesis advisor, Col Jeff Donnithorne, for his constant guidance, suggestions, and patience throughout this process. Without his inspiration, this thesis would never have gotten off the ground and without his belief in me, this thesis would never have reached completion. I thank Dr. Wendy Whitman Cobb for faithfully reading my working drafts, sharing her insights from her space background, and putting up with my interesting sentence structures.

Finally, I offer my sincerest thanks to the cast of instructors, mentors, classmates, friends, and family who helped me to steer this project from brainstorming to completion.

ABSTRACT

This thesis examines the impact of the creation of the Space Force on the Air Force. The creation of the Space Force removed space war-fighting from the responsibility of the Air Force. This thesis poses the question of what should be the ensuing identity of the Air Force and what elements of space should the Air Force retain. The thesis draws upon professional evolution theory for an overall theoretical framework and characterizes the services as professions that gain and maintain jurisdiction over tasks in domains crucial to mission accomplishment. Using a developed framework of four analytical lenses—organization, technology, physical environment, and culture—the thesis uses a historical analysis of the birth of the Air Force and analyzes how the Army and Navy responded to the arrival of a new service. After analyzing the Army and Navy's reactions, the thesis filters potential lessons through two key differences—the enduring effects of the 1986 Goldwater-Nichols Act and the unique nature of the space domain. Finally, the thesis provides recommendations in the four analytical areas regarding what space capabilities the Air Force should retain. The thesis identifies driving motivations around the birth of the Air Force to provide insights about a future Air Force identity, and provides recommendations using organizational culture theory as to how to achieve an air-centric identity.

CONTENTS

LIST OF ILLUSTRATIONS

Chapter 1

Introduction

> *If there is one attitude more dangerous than to assume that a future war will be just like the last one, it is to imagine that it will be so utterly different we can afford to ignore all the lessons of the last one.*
>
> *John C. Slessor*

On December 17, 2019, with the flourish of a pen, President Trump signed the United States Space Force (USSF) into existence. The launching of the USSF within the Department of the Air Force expelled the United States Air Force (USAF) from the decision-making role of determining the future of the US military in space. However, the establishment of the USSF raises a critical question. What will the USAF look like as the burden of space warfighting is removed from its plate? Although the USAF is no longer responsible for fighting the nation's wars in space, access to the space domain is essential to realize full USAF capabilities. This thesis explores the question of what the USAF will look like now that the USSF exists.

Audience and Research Question

The intended audience of this thesis is the decision-makers that will determine the future of the USAF. The decision-makers consist primarily of the Secretary of the Air Force (SECAF) and the Chief of Staff of the Air Force (CSAF). What will the USAF look like after the creation of the USSF? This question's answer resides in the hands of the SECAF. As the chief adjudicator for the Department of the Air Force, the SECAF plays the role of a judge deciding which spouse gets what after a divorce. The Fiscal Year (FY) 2020 National Defense Authorization Act (NDAA) has already declared that the initial assets and personnel of the USSF shall come from the Department of the Air Force alone.[1] The SECAF will have to decide which Air Force Specialty Codes (AFSCs) transition over to the USSF. Similarly, the SECAF will decide which assets, roles, and missions shall reside solely within the USSF's domain. As the USSF grows and the USAF thins, what needs to remain within the USAF? To answer the question of what the USAF will look like after the creation of the USSF, this thesis divides the initial question

[1] United States Congress, "National Defense Authorization Act For Fiscal Year 2020," December 17, 2019, 904.

into two sub-questions: what elements of space should the USAF retain and what should be the ensuing identity of the USAF?

What are the space capabilities the USAF should retain to remain a fighting force? The NDAA currently apportions all USAF assets that were under Air Force Space Command to the USSF. With the stroke of a pen, Air Force Space Command ceased to exist. The lead command for space in the USAF, with its top tier of space personnel, all exited the service. This thesis will explore the effect of this action on the space capabilities and assets left in the USAF. Will the USAF need to establish a new space command? As the SECAF transitions more personnel to the USSF from the USAF, will the USAF replace that personnel?

The creation of the USSF is compared to the establishment of the USAF as a new service in 1947.[2] However, the National Security Act (NSA) of 1947 established the Department of the Air Force and the USAF as its sole military branch. The FY 2020 NDAA does not establish a new department but instead splits the Department of the Air Force into the USAF and the USSF. The Space Force is akin to the Marine Corps within the Department of the Navy.[3] Does placing the USSF within the Department of the Air Force ensure stronger ties between the USAF and the USSF, thereby reducing the need for redundant capabilities? Does the USAF not need to retain organic space assets because the space capabilities of the USSF still reside within the Department of the Air Force? These are all questions that SECAF needs to answer. While SECAF holds the solutions to the first sub-question, the CSAF is responsible for the identity sub-question.

As the senior military member within the service, the CSAF shapes the identity of the USAF. Removing the space mission from the USAF will undoubtedly have an impact on the identity of Airmen. Like children after a divorce, the Airmen left behind in the USAF after the USSF-split are different. They are no longer members of the world's greatest Air and Space Force but just the world's greatest Air Force. While the Department of the Air Force still embraces its air and space identity, the space portion of that identity resides in the USSF and not the USAF. Airmen are merely that, Airmen, not

[2] Sandra Erwin, "U.S. Space Force Has Lifted off, Now the Journey Begins - SpaceNews.Com," SpaceNews, January 24, 2020, https://spacenews.com/u-s-space-force-has-lifted-off-now-the-journey-begins/.
[3] Erwin.

aerospace warriors. This shift goes beyond nomenclature but encompasses the domains in which Airmen held sway and supremacy. Previously, Air and Space dominance was the responsibility of the CSAF and his or her Airmen. Now the CSAF must balance the supporting-supported relationship of air dominance, relying on and supporting the Chief of Space Operations. To reconstruct the Air Force's identity, the CSAF must answer the question of what are the central tenets around which the Air Force coalesced. The answer to this question should lead to an air-centric identity rooted in the ability of the Air Force to deliver strategic capability from and within the air domain.

Limitations

The topical nature of this thesis, due to the recent signing of the NDAA and the rapidly evolving environment, poses limitations to this thesis. Service leaders are currently making decisions regarding the future of the USAF and, as such, concerns and recommendations raised in this thesis may already be in the works behind closed doors. This thesis also does not conduct an in-depth cultural study of the Air Force but relies on information from other sources.[4] Future studies should explore the Air Force's culture in greater detail to determine more specific culture and identity recommendations.

As a rated pilot with 14 years of active duty service, this author's bias and focus on the rated aspects of the USAF shines brightly in this thesis. Non-rated personnel in the USAF are important. Every Airman is essential to the USAF mission. When discussing USAF identity and culture, this thesis focuses on the rated identity and culture, as the rated mission was the determining factor in establishing the USAF. The author acknowledges that the USAF mission has evolved beyond the realm of aircraft. The USAF would benefit from a much larger study tackling the effect of the split of the USSF on the USAF as a whole and not just the rated aspect of its mission.

Background

Previous SAASS theses regarding space and the USAF have focused on topics

[4] Alfred Goldberg, *A History of the United States Air Force 1907-1957* (Princeton, N.J: D. Van Nostrand Company, INC, 1957); James W Williams, *A History of Army Aviation: From Its Beginnings to the War on Terror* (New York: iUniverse, 2005); Walter J. Boyne, *Beyond the Wild Blue: A History of the United States Air Force, 1947-1997*, 1st ed (New York: St. Martin's Press, 1997); Air Force Historical Research Agency, "The Birth of the United States Air Force," January 9, 2008, https://www.afhra.af.mil/About-Us/Fact-Sheets/Display/Article/433914/the-birth-of-the-united-states-air-force/; Benjamin S. Lambeth, *Mastering the Ultimate High Ground: Next Steps in the Military Uses of Space* (Santa Monica, CA: RAND, Project Air Force, 2003).

spanning from advocacy of a space power theory to why the US needs an independent Space Force, to what that Space Force should look like. Lieutenant Colonel Brian Fredrickson's *Globalness: Toward a Space Power Theory* argues the need for a global space power theory that best maximizes the advantages offered by space.[5] Major Brent Ziarnick's *Tough Tommy's Space Force: General Thomas S. Power and The Air Force Space Program* reflects on the work of General Power, his influence on the space program, and a better way forward for the space program.[6] Both theses are excellent, but they both benefit USSF strategists looking for a compass to the future of the USSF, not the USAF.

Lieutenant Colonel Peter Norsky's *The Unites States Space Force: Not If, But When* is an excellent document that argues the inevitability of the space force while detailing the USAF's efforts to develop and advance space capability.[7] Norsky's thesis argues that, much like the USAF needed independence to realize the possibilities of the aerial domain fully, so does the Space Force need its independence to capitalize on the benefits of space fully. However, Norsky does not delve into the span of control and identity of an amputated USAF. *Space Capabilities and Functional Organizations: An Analysis of Space Integration Since Desert Storm* by Major Robert Ramsden is a superb thesis on the best way to maximize space capabilities via integration into organizational structures.[8] Ramsden does not delve into the creation of a new service but instead focuses on changing existing organizational structures to reap the rewards of space fully. Focusing on the USAF, this thesis synthesizes these perspectives to provide recommendations on how the USAF can adapt and excel in its redefined mission, dominating the air while integrating effectively with space.

Method of Analysis

This thesis uses a historical analysis of past events to distill lessons learned to

[5] Brian E. Fredrikson and Air University, *Globalness: Toward a Space Power Theory [.Mil Access Only]* (Maxwell AFB, Ala.: School of Advanced Air and Space Studies, 2006), Web.
[6] Brent D. Ziarnick, *Tough Tommy's Space Force: General Thomas S. Power and the Air Force Space Program [.Mil Access Only]* (Maxwell AFB, Ala.: School of Advanced Air and Space Studies, 2016), web.
[7] Peter C. Norsky, *The United States Space Force: Not If, but When [.Mil Access Only]* (Maxwell AFB, Ala.: School of Advanced Air and Space Studies, 2016), web.
[8] Robert L. Ramsden, *Space Capabilities and Functional Organizations: An Analysis of Space Integration since Desert Storm [.Mil Access Only]* (Maxwell AFB, Ala.: School of Advanced Air and Space Studies, 2006), Web.

provide recommendations. This thesis draws upon Andrew Abbott's theory of professional evolution as an overall explanatory framework. In *System of Professions,* Abbott explores the nature of professions and builds a theory explaining how professions evolve through stages of growth, splitting, adaptation, and sometimes death. Abbott's treatment of professional tasks, power, and jurisdiction is especially relevant to this thesis. By treating the Air Force as a profession, this thesis applies Abbott's theory to provide recommendations regarding the future of the Air Force. The framework develops from Abbott's theory but incorporates ideas from the fields of organizational culture and organizational identity. Edgar H. Schein's *Organizational Culture and Leadership* explains the essence of organizational culture: what it is, how it is established, and how to change or reinforce culture. In "The Dynamics of Organizational Identity," Mary Jo Hatch and Majken Schultz develop an interrelated model of organizational identity that entwines culture, identity, and image into an iterative relationship. Building on these works, this thesis settles on four lenses through which to view relevant historical events: organization, technology, physical environment, and culture.

To determine what the USAF will look like after the USSF, it is helpful for one to project 10-20 years into the future and imagine the desired AF and then build a bridge that connects the AF of today with the desired AF of 2030. The bridge is best built with history. The abutments of our bridge are the Air Force of today and the Air Force of the future. The beams of the bridge are the historical precedents: the establishment of the United States Army Air Corps (USAAC) in 1926, General Headquarters Air Force in 1935, the United States Army Air Forces (USAAF) in 1941, the creation of the USAF as an independent service by the National Security Act (NSA) of 1947, the Key West Agreement of 1948, the Pace-Finletter Agreements of 1951 and 1952, and the Wilson Memorandum of 1957. Upon the beams of the bridge, the spans are the lessons learned framed in the context of the four lenses. The spans rest upon the beams of historical precedents to bridge the gap between the Air Force of today and the Air Force of the future. Since the creation of the USSF is both like and unlike the establishment of the USAF in 1947, the specific lessons learned must be robust but adaptable enough to accommodate the uncertainties of the future. From analyzing the lessons learned, one can begin to answer the questions necessary to make recommendations for the USAF to

bridge the gap across the uncertainties of the future.

The USAF's identity was born out of a fight for independence to pursue missions in the air free from the operational constraints of the Army. Over time, the identity of the USAF evolved beyond missions in the air domain to include the space domain. However, the USAF has solidified its independence, and with the separation of the USSF, the Air Force needs to reconstruct itself around what it can do that no other service can. The goal of this identity reconstruction is not independence, but a return to the essential missions that made the USAF what it is. This thesis will provide recommendations to shape the course of the USAF's future.

Organization

This thesis will traverse the historical bridge and proceeds as follows. Chapter 2 expands upon the theoretical framework used for analysis. Chapter 3 looks at the origins of the Air Force and the Air Force's identify as the provider of strategic airpower. While the NSA of 1947 established the Department of the Air Force, advocates conceived of and began lobbying for an independent air force much earlier. Chapter 4 explores the challenges associated with dividing roles and missions in aviation. Both the Army and Navy had aviation components and the creation of the USAF threatened each service's autonomy. The NSA of 1947 converted the USAAF into the USAF; it did not allocate naval air assets to the USAF. As the services continued to fight over jurisdiction of the air, the Key West Agreement of 1948, the Pace-Finletter Agreements of 1951 and 1952, and the Wilson Memorandum of 1957 attempted to resolve the question of which service owned what aviation assets and missions. The reasoning behind the allocation of roles and missions bears relevance in the current discussion regarding the USSF. Much like subsequent agreements tackled leftover problems from the NSA of 1947, there will be future agreements to settle disputes over space jurisdiction. Chapter 5 of the thesis examines the potential impact of the Goldwater-Nichols Department of Defense Reorganization Act of 1986 as well as the nature of the space domain on future Air Force considerations. Chapter 6 concludes the thesis by using applicable lessons learned from the Army in the 1950s with the added consideration of the Goldwater-Nichols Act and unique nature of space to provide recommendations for the Air Force.

The Air Force should retain some space capabilities. However, the USAF must do

so while balancing joint integration, eliminating redundancy, and fulfilling core service missions. This thesis concludes that the USAF will need to recreate a space component within the USAF. It should not have the same scope as the previous AFSPC, but the USAF needs a place to train and employ space professionals. Additionally, personnel from a recreated space component can serve as the USAF's representation in US Space Command.

To answer the question of what should be the ensuing USAF identity, the CSAF should look back to the origins of the USAF. The Air Force was born out of a fight for independence and the strategic use of airpower. By going back to the origins of the USAF in the era before space, the CSAF can find an identity to coalesce around. To chart a course for the future identity of the Air Force, one must first understand the birth of the Air Force.

Chapter 2

Theoretical Background

Theory then becomes a guide to anyone who wants to learn about war from books.

Carl Von Clausewitz

This chapter expands upon the theoretical framework used for the remainder of the paper. This thesis uses Abbott's theory of professions to provide recommendations to the two sub-questions regarding future Air Force identity and tasks. This thesis argues that the separation of the United States Space Force (USSF) from the United States Air Force (USAF) results in a change of the tasks and jurisdiction of the USAF. This thesis uses Abbott's work to analyze how these jurisdictional and task changes shape the future of the USAF. The first part of the chapter expands upon the relevant ideas from *System of Professions.* The chapter then introduces complementary ideas regarding organizational culture from Edgar Schein's *Organizational Culture and Leadership* and organizational identity from Mary Jo Hatch and Majken Schultz's article "The Dynamics of Organizational Identity."[1] Finally, the chapter concludes with a synthesized definition of the four lenses to view the historical events presented in later chapters.

Abbott's theory of professions

Abbott defines professions as "exclusive occupational groups applying somewhat abstract knowledge to particular cases."[2] Unpacking this definition yields three distinct components: exclusive groups, abstract knowledge, and a specific purpose or case to

[1] Abbott's System of Professions best captures the tension inherent in determining jurisdictional control of military space. Schein's Organizational Culture and Leadership is a seminal work that has stood the test of time and is on its fifth edition. Hatch and Schultz's model provides a great relationship between culture and identity. These three works best capture a holistic path to view the USAF's current situation. Beyond these three chosen works, there are other influential works on organizational culture. Davide Ravasi and Majken Schultz's article titled "Responding to Organizational Identity Threats: Exploring the Role of Organizational Culture" explores organizational responses to environmental changes that force members to question their organization's identity. William Ouchi and Alan Wilkins's "Organizational Culture" uses sociology to explore such questions as can organizational culture be intentionally managed. William G. Ouchi and Alan L. Wilkins, "Organizational Culture," *Annual Reviews of Sociology* 11 (1985): 457–83; Davide Ravasi and Majken Schultz, "Responding to Organizational Identity Threats: Exploring the Role of Organizational Culture," *The Academy of Management Journal* Vol. 49, no. No. 3 (June 2006): 433–58.

[2] Andrew Delano Abbott, *The System of Professions: An Essay on the Division of Expert Labor* (Chicago: University of Chicago Press, 1988), 8.

apply said knowledge. The exclusiveness component of a profession is necessary to distinguish the practitioners of a profession from similar professions and the rest of the population. The professional group shares and controls some esoteric knowledge. The abstraction of the knowledge—the second element in Abbott's definition—is central to the exclusivity of the group. The knowledge cannot be something commonplace, or else the group risks losing its exclusivity and the ability to control the dissemination of knowledge. By controlling the knowledge regarding the profession, the group controls the practical techniques which stem from applying the knowledge. According to Abbott, the control stemming from abstract knowledge is what enables survival in a competitive system of professions.[3]

The third and final component of Abbott's definition relates to the specific purpose, or core tasks, of the controlled knowledge. Recombining these three components results in professions as exclusive groups that retain control over a specific knowledge system to accomplish specific tasks free from competitors and interlopers. As a profession, the USAF controls multiple knowledge sets besides aviation. However, the thesis will focus on aviation as that is the core knowledge set around which the USAF coalesces. As such, as a profession, the USAF applies the knowledge of military aviation to employ force in defense of the United States through exclusive technology and mission sets.

To determine the USAF's future organic space capabilities is to ask what are the space roles and missions the Air Force should retain. Abbott's framework provides a means to answer this question by viewing the Air Force as a profession and roles and missions as the foundational means of accomplishing professional tasks. Abbott describes tasks and jurisdiction as two essential aspects of professions. To understand what organic space capabilities the USAF should retain, one must first understand the tasks and jurisdiction of the USAF.

Tasks are one of the defining characteristics of a profession as they indicate areas of sole responsibility within a profession. Abbott defines tasks as having objective and subjective qualities. Objective qualities of a task are those that derive from natural and

[3] Abbott, 9.

technological constraints.[4] Abbott further breaks down objective qualities of tasks into four foundational areas: organization, technology, natural objects and facts, and slow-changing cultural structure.[5] Organization accounts for how organizational structures affect the efficacy of a profession in accomplishing its tasks. For example, Air Combat Command and Air Education and Training Command are organizational structures within the Air Force that focus on specific tasks in support of the overall Air Force mission. Technology refers to the technology necessary to accomplish professional tasks: for example, bomber and fighter aircraft used by the Air Force. Natural objects and facts relate to the physical aspects of the environment that affect the profession: the air through which aircraft fly. Finally, slow-changing cultural structures encompass the objective aspect of a profession's culture that affect task accomplishment. The objective aspect of culture refers to the concepts regarding the classification of natural objects and facts that have evolved into a seemingly tangible objective nature: the concept of territorial airspace. For simplicity, this thesis categorizes these four foundations as organization, technology, physical environment, and culture. Differentiating objective and subjective qualities is difficult as they are inter-related and are both affected by culture.

Subjective qualities stem from the past and present culture of a profession.[6] Abbott writes that the subjective qualities of a task arise from the cultural aspects of the profession that holds jurisdiction of the task. Jurisdiction is the link between a profession and its task.[7] As such, investigating the subjective qualities of a task necessitates analyzing the jurisdictional mechanisms of a task. Formal and informal social structures can anchor jurisdiction.[8] Formal jurisdiction refers to legally granted authority, and informal jurisdiction relies on norms or public acceptance.[9] Competition between professions ensues over jurisdictional claims. Abbott writes that jurisdictional claims have three parts: "claims to classify a problem, to reason about it, and to take action on it: in more formal terms, to diagnose, to infer, and to treat."[10]

---

[4] Abbott, 36.
[5] Abbott, *The System of Professions*, 39.
[6] Abbott, 36.
[7] Abbott, 20.
[8] Abbott, 20.
[9] Abbott, 70–72.
[10] Abbott, 40.

Diagnosing a problem "takes information into the professional knowledge system," inference "indicates a range of treatments with predicted outcomes," and treatment provides specific instructions to remedy the problem.[11] Abbott refers to diagnosis and treatment as mediating acts; this is because these parts require interaction outside the profession.[12] Inference, by contrast, lies solely within the jurisdiction of a profession. During diagnosis, the aspects of the problem not specific to the profession are diagnosed away. As such, only the aspects that require the abstract knowledge set are left to be inferred upon. Inference refers to the considerations that only a profession can make. The variety of possible treatments produced after inference may be implemented by the profession or decided upon by another profession. While the three parts may occur in parallel or sequence, Abbott argues that the sequence and jurisdictional nature of these three parts embody the cultural aspects of a profession.[13] Figure 1 is a diagram depicting the relationship between tasks and jurisdiction.

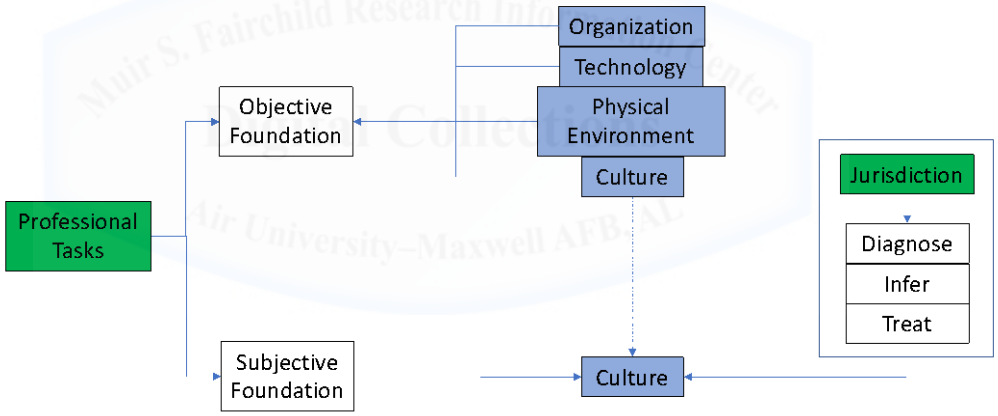

Figure 1: A Diagram of the relationship between Abbott's tasks and jurisdiction
Source: Adapted from Andrew Delano Abbott, The System of Professions: An Essay on the Division of Expert Labor (Chicago: University of Chicago Press, 1988), 8.

How much jurisdiction a profession has over these three parts affect the culture of a profession. While a profession is always in charge of inference, the degree of control over the information presented to diagnose and the decision to implement a presented

[11] Abbott, 40.
[12] Abbott, 40.
[13] Abbott, 40.

treatment determine the structure of a profession's jurisdictional claim.[14] Abbott is writing based on lessons extrapolated primarily from the medical field, hence his choice of words. This thesis shall use terms more amenable to the Air Force to describe the three parts of jurisdictional claim and subjective culture: to define, to theorize, and to implement. By combining the subjective expansion of culture to the objective aspect of culture, the expanded task foundation encompasses entrenched cultural concepts and the claim to define problems, theorize and present solutions to problems, and implement those solutions.

Abbott's framework provides the four lenses – organization, technology, physical environment, and culture – that help answer the question of USAF roles and missions in space. As a profession, the USAF has jurisdictional claim to the task of defending the US using from and within the air domain. The ubiquitous nature of space means that implementing theorized solutions to diagnosed problems may require the Air Force to rely on organic space assets. The USAF's objective qualities of organization, technology, and physical environment should support its jurisdictional claim by incorporating space. The Air Force's changing roles and missions will also affect its culture.

Abbott's exploration of culture, both objective and subjective, focuses on external factors and the effect on a profession. Both objective and subjective qualities make professions vulnerable to change, but Abbott goes further to state that objective qualities resist reconstruction.[15] The inertia presented by objective qualities results from the tangible aspect of the profession. For example, even if a profession wants to change and gains control of the abstract knowledge, change is impossible without gaining the tangible physical components required to accomplish the task. This thesis argues that subjective qualities resist changes too, as Edgar Schein also argues. This chapter now delves into Schein's work on organizational culture to illuminate the internal aspects of culture.

Understanding organizational culture

Organizational culture, according to Schein, is "a pattern of shared basic

[14] Abbott, 41.
[15] Abbott, 36–37.

assumptions learned by a group as it solved its problems of external adaptation and internal integration, which has worked well enough to be considered valid, and therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems."[16] Schein argues that culture can be analyzed at three major levels based on the degree to which a cultural phenomenon is visible to an observer. His three levels are artifacts, espoused beliefs and values, and basic underlying assumptions.[17] Figure 2 depicts the three levels and their respective characteristics. Identifying those characteristics within an organization or profession will aid in illuminating the respective culture.

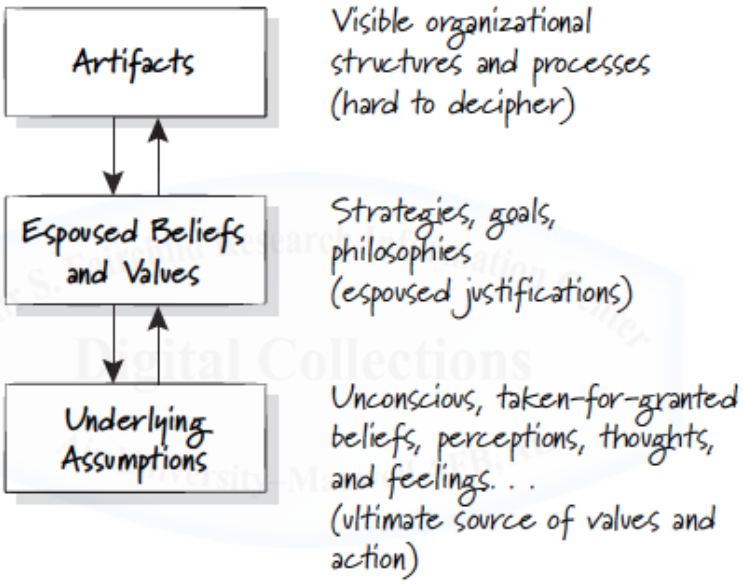

Figure 2: Schein's Three Levels of Culture
Source: Edgar H. Schein, Organizational Culture and Leadership, 3rd ed, The Jossey-Bass Business & Management Series (San Francisco: Jossey-Bass, 2004), 26.

Artifacts are the most visible and include language, technology, observed behavior, and the resultant processes that make behavior routine, charters, and formal descriptions of how organizations work.[18] Espoused beliefs and values require a more in-depth observation and help to understand the reason behind observed behavior. They are the conscious reasons why an organization behaves a certain way. Basic underlying assumptions refer to the unconscious reasons why an organization operates as it does.

[16] Edgar H. Schein, *Organizational Culture and Leadership*, 4. ed, The Jossey-Bass Business & Management Series (San Francisco, Calif: Jossey-Bass, 2010), 18.
[17] Schein, 24.
[18] Schein, 23–24.

Schein concludes that to understand an organization's culture, one must understand the shared basic assumptions and the learning process through which such assumptions evolve.[19] One must look beyond easily recognizable artifacts and proclaimed beliefs and values.

Another aspect of Schein's work relevant to the recommendations of this thesis explores cultural change. Schein describes cultural change as occurring naturally based on the life-cycle of an organization or in response to a crisis. Figure 3 depicts Schein's characterization of the stages of change. This thesis shall focus on a mature organization and turnarounds as best encapsulations of the conditions facing the Air Force with the creation of the Space Force.

Organizational Stage	*Change Mechanism*
Founding and early growth	1. Incremental change through general and specific evolution
	2. Insight
	3. Promotion of hybrids within the culture
Midlife	4. Systematic promotion from selected subcultures
	5. Technological seduction
	6. Infusion of outsiders
Maturity and decline	7. Scandal and explosion of myths
	8. Turnarounds
	9. Mergers and acquisitions
	10. Destruction and rebirth

Figure 3: Culture Change Mechanisms
Source: Edgar H. Schein, Organizational Culture and Leadership, 3rd ed, The Jossey-Bass Business & Management Series (San Francisco: Jossey-Bass, 2004), 292

According to Schein, cultural change is difficult and more difficult in mature organizations because of continued success.[20] As organizations succeed, basic assumptions become more entrenched, and espoused values and beliefs are increasingly out of sync with actual assumptions by which they operate. These entrenched assumptions become a liability in dynamic environments as assumptions lose their validity. Crises create dynamic environments and present an opportunity to assess

[19] Schein, 32.
[20] Schein, 289.

assumptions. The removal of space warfighting from USAF control is a crisis for the Air Force; while not a crisis of existential nature, the change in USAF missions creates a dynamic environment for the USAF to assess assumptions. Schein states that after a crisis, an organization can choose between turnaround or destruction. Turnaround makes the organization adaptive via a rapid transformation of parts of the culture.[21] Destruction is a total reorganization of the organization and its culture.[22] This thesis recommends turnaround as the ideal choice for the Air Force. Turnarounds require the involvement of the entire organization, but especially leadership.

Cultural change requires strong leaders able to unfreeze the organization, implement necessary changes via cognitive restructuring, and finally refreeze the new changes.[23] Figure 4 depicts Schein's stages of learning/change.

Stage 1 Unfreezing: Creating the Motivation to Change

- Disconfirmation
- Creation of survival anxiety or guilt
- Creation of psychological safety to overcome learning anxiety

Stage 2 Learning New Concepts, New Meanings for Old Concepts, and New Standards for Judgment

- Imitation of and identification with role models
- Scanning for solutions and trial-and-error learning

Stage 3 Internalizing New Concepts, Meanings, and Standards

- Incorporation into self-concept and identity
- Incorporation into ongoing relationships

Figure 4: The Stages of Learning/Change
Source: Edgar H. Schein, Organizational Culture and Leadership, 3rd ed, The Jossey-Bass Business & Management Series (San Francisco: Jossey-Bass, 2004), 300.

Unfreezing refers to the creation of disequilibrium to create a motivation to change. Schein deconstructs unfreezing to three components that must be present for an organization to develop the motivation to change: "enough disconfirming data to cause serious discomfort and disequilibrium; the connection of disconfirming data to important goals and ideals, causing anxiety and/or guilt; and enough psychological safety, in the sense of being able to see a possibility of solving the problem and learning something

[21] Schein, 293.
[22] Schein, 293.
[23] Schein, 300.

new without loss of identity or integrity."[24] The disequilibrium resulting from the creation of the Space Force and the loss of the space mission and AFSCs satisfies the first component. Connecting the resulting change brought on by the Space Force to the Air Force mission of national security fulfils the second component.

Regarding the third component, Schein provides leaders with techniques on creating psychological safety. Schein lists eight activities a leader must execute almost simultaneously to provide adequate psychological safety. These are a "compelling positive vision; formal training; involvement of the learner; informal training of relevant family groups and teams; practice fields, coaches, and feedback; positive role models; support groups in which learning problems can be aired and discussed; and systems and structures that are consistent with the new way of thinking and working."[25] Schein argues that transformational cultural change fails because leaders do not create the eight conditions. The final chapter of this thesis will use some of Schein's points when discussing recommendations for the Air Force. Cognitive restructuring involves learning new concepts and new meanings to old concepts.[26] This thesis recommends imitation to provide new meanings to old concepts. Imitation requires a leader that is a role model for the organization.[27] The final step in the change process is refreezing. Refreezing requires actual results to stabilize the organization. If the implemented changes do not provide adequate results, the resulting disconfirming information will launch a new change process.[28] Organizational culture change is an iterative process that seeks to establish organizational identity. This chapter shall now delve into organizational identity.

Understanding Organizational Identity

In "The Dynamics of Organizational Identity," Hatch and Schultz define organizational identity as constituted by a dynamic set of processes that interrelate culture and image.[29] Similar to Schein's definition, Hatch and Schultz define culture as the

[24] Schein, 301.
[25] Schein, 305–7.
[26] Schein, 309.
[27] Schein, 310.
[28] Edgar H. Schein, *Organizational Culture and Leadership*, 3rd ed, The Jossey-Bass Business & Management Series (San Francisco: Jossey-Bass, 2004), 310.
[29] Mary Jo Hatch and Majken Schultz, "The Dynamics of Organizational Identity," *Human Relations* 55 (2002): 997.

assumptions, beliefs, and values that give meaning to organizations' actions, including self-definition.[30] Image is the set of views on the organization held by clients or customers, an external view that matters to the organization.[31] Figure 5 depicts Hatch and Schultz's model of organizational identity.

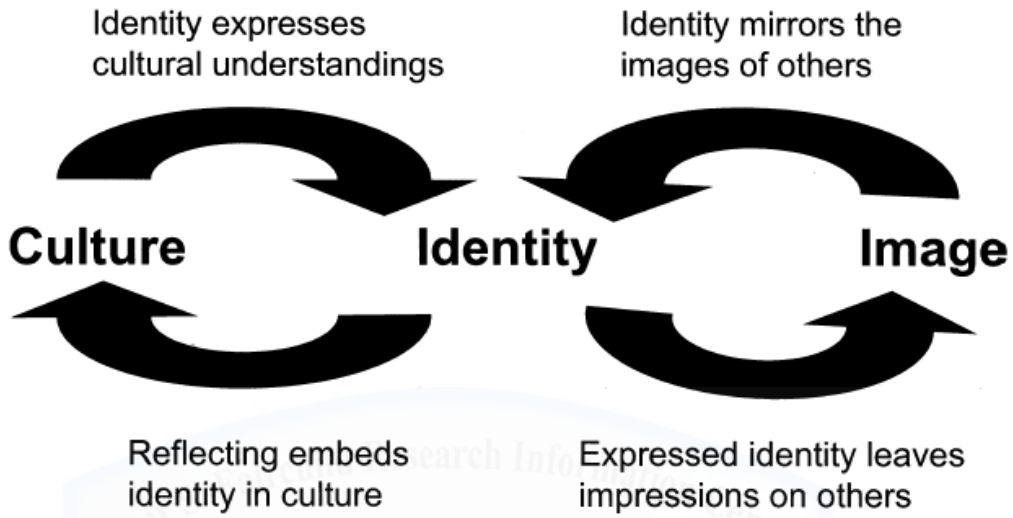

Figure 5: Organizational Identity Dynamics Model
Source: Mary Jo Hatch and Majken Schultz, "The Dynamics of Organizational Identity," Human Relations 55 (2002): 991.

The model depicts the identity-mediated relationship between cultural understandings and externally-held images. Four processes characterize the interrelated nature of organizational identity, culture, and image: mirroring, identity is mirrored in the image of others; reflecting, identity is embedded in cultural understandings; expressing, culture makes itself known through identity claims; and impressing, expressions of identity leave impressions on others.[32] Mirroring and reflecting describe the influence of image on organizational culture, and expressing and impressing describe the influence of organizational culture on externally-held images of the organization.[33] The constant interplay of image and culture continually creates, sustains, and changes identity; an organization's identity is never static but could be consistently reinforced.

Although not explicitly depicted, Hatch and Schultz's model also depicts power.

[30] Hatch and Schultz, 996.
[31] Hatch and Schultz, 995.
[32] Hatch and Schultz, 991.
[33] Hatch and Schultz, 998.

Power is present in the influence, size of the arrow, of the different processes.[34] The power differential between the internal views of the organization (culture) and the external views of stakeholders (image) determines the effect of the Hatch and Schultz's four processes. For example, civilian leaders (stakeholders) could be unwilling to listen to the advice of Air Force leaders (culture) when considering a decision. The resulting decision would impact the Air Force's identity but would also reflect on the Air Force's culture. Power can be applied for good or for ill; it can disrupt the dynamics of organizational identity or encourage the continuous interplay between all the processes.[35]

Hatch and Schultz's work gives us a causal relationship between culture and identity. To answer the second sub-question of what should be the ensuing identity of the USAF, this thesis will focus on the expression of culture on identity. This thesis argues that the Chief of Staff of the Air Force has more power than external stakeholders to affect the USAF's identity. The power imbalance stems from the formal and informal jurisdiction imbued in the position of Chief of Staff. The recommendations in this thesis focus on internal cultural changes. The identity-mediated relationship between culture, identity, and image, although a continuous loop, should start with internal cultural changes.

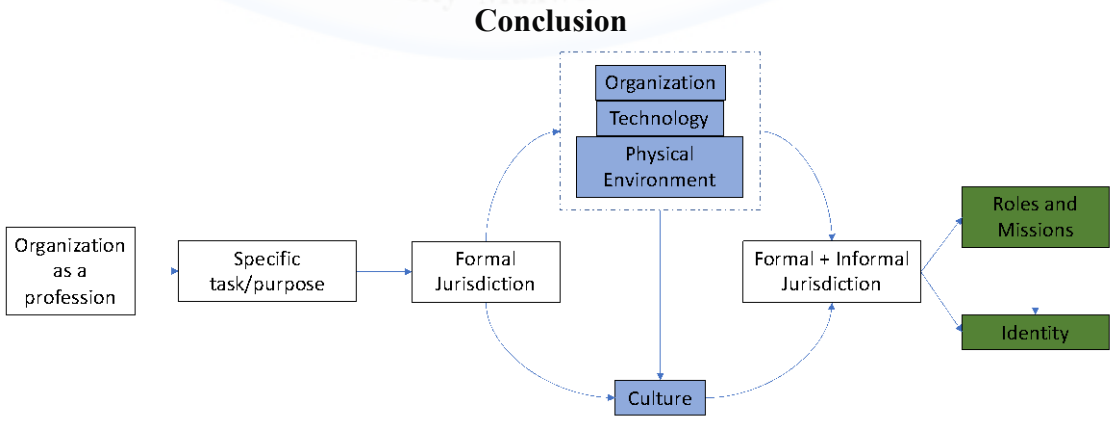

Figure 6: Consolidated Theoretical Framework
Source: Author's Original Work

The three works explored above coalesce into a framework for the remainder of

[34] Hatch and Schultz, 1005.
[35] Hatch and Schultz, 1005.

this thesis depicted in Figure 6. To determine the roles and missions and identity of the Air Force, this framework treats the Air Force organization as a profession. Professions have specific tasks they must achieve and are granted formal jurisdictional rights over specific knowledge and assets necessary to accomplish that task. From that formal jurisdictional authority, the profession builds an organizational structure, acquires technology, determines its physical environment, and establishes a culture necessary to accomplish its task. The informal jurisdiction stems from the interaction of the four areas and other proximate professions. Of the four areas, a profession's culture most heavily influences its informal jurisdiction. From the amended jurisdiction, the organization creates roles and missions necessary to fulfill its task. The organization's identity is the amalgamation of its roles and missions and overall jurisdiction. This framework uses organizational structure, technology, physical environment, and culture as lenses to determine roles and missions and identity. These lenses filter the organization's formal jurisdiction to ascertain the informal jurisdiction and resulting roles and missions necessary to achieve the purpose behind jurisdictional authority. The cultural lens best illuminates identity.

The cultural lens is a combination of different theories. Abbott's objective quality of culture nests suitably within Schein's definition of cultural artifacts. Schein's definition of culture melds with that of Hatch and Schultz. However, Schein's premise of changing culture as to keep identity static contrasts with Hatch and Schultz's position that identity is and should be dynamic. A bridge between these two positions is that cultural change should be geared towards an intentional identity. Although the resulting identity is dynamic, identity variation should be minimal to appear static. Hatch and Schultz's concept of power also dovetails well with Abbott's concept of jurisdiction. Just as power determines the influences of identity and image on culture, so too does professional jurisdiction determine a profession's cultural qualities. Power and jurisdiction may stem from formal or informal sources.

This thesis is concerned with answering the two sub-questions of what elements of space should the USAF retain, and what should be the ensuing identity of the USAF? The discussed theories help answer these questions by providing an analytical lens. Simplifying the applicable parts of the different theories into a manageable framework

yields the four sections of our analytical lens: organization, technology, physical environment, and culture. Organization, technology, and physical environment encompass Abbott's objective qualities and Schein's cultural artifacts. Culture enfolds Abbott's objective and subjective aspects of culture, Abbott's concept of jurisdiction, Schein's espoused beliefs and underlying assumptions, and Hatch and Schultz's cultural effects on identity.

Organization will explore the hierarchy, command structure, and personnel makeup. Technology will explore the number, types, and capabilities of aircraft and weapon systems, available and desired. Physical environment will delve into the effect of the constraints imposed by the domains of air, land, sea, and space. Culture is the most expansive category and will cover the ability to define, theorize, and implement solutions to problems; artifacts; espoused beliefs and values, underlying basic assumptions. Analyzing the Army's Organic Aviation using our analytical lens will yield recommendations for Air Force organic space capabilities. Analyzing the Air Force's culture and its resulting identity during its formative years will yield recommendations for cultural changes going forward. This thesis will now begin building our historical bridge with selected historical lessons in our four focus areas.

Chapter 3

The Birth of an Air Force

The future of our nation is forever bound up in the development of Air Power.

Colonel William 'Billy' Mitchell

The United States Air Force (USAF) was born on September 18, 1947,[1] authorized under the National Security Act (NSA) of 1947.[2] The NSA established the Department of the Air Force as a coequal branch to the newly named Department of the Army and the Department of the Navy within the National Military Establishment (NME), headed by the Secretary of Defense.[3] The NME was renamed as the Department of Defense (DoD) in 1949.[4] The NSA of 1947 separated the Army Air Forces from the Department of the Army and established the USAF within the Department of the Air Force. Although the USAF celebrates its creation as occurring in 1947, the conception date of the USAF occurred much earlier as the fight for an independent air force dates to the burgeoning phase of military aviation. While seeking to understand the best use of airpower, early airpower advocates sought autonomy and freedom from restrictive and ground-centric notions of airpower's use. These early actions included the establishment of the Army Air Service in 1920, Army Air Corps in 1926, General Headquarters Air Force in 1935, and the Army Air Forces in 1941.

This chapter uses the origins of the Air Force and its fight for independence to show how the USAF cemented its role and identity as an independent provider of airpower for the DoD. This thesis seeks to analyze these events using the previously developed lenses: organization, technology, physical environment, and culture. This chapter will summarize significant events in the birth of the USAF. The chapter then delves into notable aspects of the evolution of the USAF within each of the four

---

[1] The NSA of 1947 was signed on July 26. (The first secretary of the USAF, W. Stuart Symington, was sworn in on September 18, 1947, a day the USAF marks as its official birthday.)

[2] Air Force Historical Research Agency, "The Birth of the United States Air Force," January 9, 2008, https://www.afhra.af.mil/About-Us/Fact-Sheets/Display/Article/433914/the-birth-of-the-united-states-air-force/.

[3] Alfred Goldberg, *A History of the United States Air Force 1907-1957* (Princeton, N.J: D. Van Nostrand Company, INC, 1957), 102.

[4] Herman S. Wolk, *The Struggle for Air Force Independence, 1943-1947*, Rev. ed. (Washington, D.C: Air Force History and Museums Program, 1997), 326.

identified lenses. By parsing out the specifics of these four areas, one can understand the mission and identity of USAF that should persist in the future.

The Air Service of the US Army (1907-1926)

The origin and purpose of the USAF revolve around the belief that true pursuit and exploitation of the air domain requires an autonomous and independent service. This belief in autonomy dates to as early as 1916 when Congressman Charles Lieb introduced the first bills calling for a department of aviation as a separate and coequal department within the national defense establishment.[5] At that time, military aviation resided primarily with the US Army. Since 1907, army aviation fell under the command of the US Army Signal Corps within the War Department. War Department Office Memorandum No. 6 created an aeronautical division responsible for all aspects "pertaining to military ballooning, air machines, and all kindred subjects."[6] At its maximum strength, the Signal Corps maintained an aviation section that consisted of an Aeronautical Division, the Signal Corps Aviation School, and 24 squadrons.[7] However, a lack of efficacy resulted in an extensive reorganization of the aviation structure of the War Department.[8] On May 21, 1918, President Woodrow Wilson ordered the transfer of responsibility of army aviation from the Signal Corps to two newly created agencies: the Bureau of Aircraft Production and the Division of Military Aeronautics.[9] Subsequently, on May 24, 1918, the War Department formally recognized these two agencies as encompassing a new organization called the Air Service of the US Army.[10] In order to facilitate coordination between the two interdependent agencies, President Wilson appointed Mr. John D. Ryan as the Director of Air Service and Second Assistant Secretary of War on August 27, 1918.[11] The Army Reorganization Act of 1920 established the Air Service as a combatant arm of the Army.[12] The other combatant arms

[5] Goldberg, *A History of the United States Air Force 1907-1957*, 99.
[6] *The Question of Autonomy for the United States Air Arm 1907-1945: Pt 2* (Maxwell AFB, Ala.: Air University, 1950), 255.
[7] Air Force Historical Research Agency, "The Birth of the United States Air Force."
[8] Goldberg, *A History of the United States Air Force 1907-1957*, 15.
[9] Goldberg, 15.
[10] Air Force Historical Research Agency, "The Birth of the United States Air Force."
[11] Goldberg, *A History of the United States Air Force 1907-1957*, 15.
[12] Goldberg, 29.

were Infantry, Cavalry, Field Artillery, Coast Artillery Corps, Corps of Engineers, and the Signal Corps.[13] The Air Service of the US Army was the first official step in the long march towards an independent air force organization and identity.

Organization

The War Department created the Air Service as a combatant arm, established the Chief of the Air Service as a Major General, and the Assistant Chief as a Brigadier General as a means to streamline operations and development.[14] The Air Service established formal training schools for officers and enlisted, emphasizing flying training and technical skills.[15] Compared to other combatant arms, the Air Service was unique in that the Chief of the Air Service retained control of research and development, procurement, and supply of aircraft, personnel and training functions.[16] Under congressional authority, the authorized strength of the Air Service was 1,516 officers and 16,000 enlisted.[17] The planned organization comprised 27 squadrons comprised of 15 observation squadrons, four surveillance squadrons, four pursuit squadrons, and four bombardment squadrons.[18] However, budgetary cutbacks and ground support prioritization limited implementation. For example, for most of the 1920s, one pursuit, one attack, and one bombardment group made up the combined offensive strength of the Air Service in the United States.[19] Even though the Reorganization Act placed tactical units under the command of flyers, tactical air units operated under the control of group commanders within the nine USA corps areas.[20] Placing the tactical units of the air service underneath ground-focused group commanders curtailed the autonomy of the Air Service.

Technology

Budgetary cutbacks and intraorganizational resource competition within the US Army stymied the technological growth of the Air Service. In 1921, the Air Service aircraft inventory entailed 1,500 training aircraft, 1,100 observation aircraft, 179 pursuit

---

[13] *The Question of Autonomy for the United States Air Arm 1907-1945: Pt 2*, 270.
[14] Air Force Historical Research Agency, "The Birth of the United States Air Force."
[15] Air Force Historical Research Agency.
[16] Goldberg, *A History of the United States Air Force 1907-1957*, 29.
[17] *The Question of Autonomy for the United States Air Arm 1907-1945: Pt 2*, 270.
[18] Goldberg, *A History of the United States Air Force 1907-1957*, 30.
[19] Goldberg, 32.
[20] Goldberg, 30.

aircraft, and twelve bombers.[21] By 1924, aircraft inventory fell to 1,364 aircraft, with only 754 in serviceable condition.[22] Of these 754 aircraft, 457 were observation aircraft with only 59 bomber, 78 pursuit, and eight attack aircraft. The hefty percentage of observation aircraft stemmed from an emphasis on World War I (WWI). Maj. Gen. Mason Patrick, Chief of the Air Service from 1921 to 1927, sought to create a properly balanced Air Service consisting of 20 percent observation units and the remaining 80 percent devoted to combat aviation.[23] However, budget constraints prevented reversing the imbalance by inhibiting the purchase of any significant number of new aircraft. As such, the Air Service focused on research and experimentation.

A central thread that connected all the different mission sets was the need for more capable aircraft. Technological advancements centered around long-distance and endurance flights, which demanded faster and more capable aircraft. Attempts to develop bombers with significant payloads failed as the available engines could not provide adequate performance. The best bomber developed by the Air Service was the NBS-4 Condor, a two-engine aircraft with a top speed of 100 miles per hour, a combat radius of 300 miles, and a service ceiling of 13,000 feet.[24] In contrast, the best pursuit aircraft developed was the PW-8 Hawk, which had a top speed of 178 miles per hour, a combat radius of 335 miles, and a service ceiling of 22,000 feet.[25] The performance differential between pursuit aircraft and bombers reinforced beliefs that the future lay in pursuit aircraft. During this period, the Air Service also introduced attack aircraft. The A-3 Falcon, designed for immediate support of ground troops via low-altitude attack, had a top speed of 140 miles per hour and a combat range of 630 miles.[26] Seeking to further extend the range of aircraft, in June 1923, the Air Service completed its first successful aerial refueling test.[27] The Air Service also made advances in day and night aerial photography, transport aviation, postal delivery, and aided the forest service in fire

[21] Goldberg, 32.
[22] Goldberg, 32.
[23] Goldberg, 32.
[24] Goldberg, 33.
[25] Goldberg, 33.
[26] Goldberg, 33.
[27] Goldberg, 34.

detection.[28] Overall, the technological foundations during the time of the Air Service sought to explore new frontiers of aviation.

Physical Environment

The air domain is the primary physical environment of the aviation profession. At this time, the air domain began at the surface of the earth and extended as high as technology allowed. The challenge for the Air Service was how to attain mastery of the air domain. During the era of the Air Service, the budding combat arm sought to conquer the air by relying on technological advances and pilot proficiency. As engineers made advances in engines and aircraft design, aircraft were able to fly higher, faster and over longer distances. The Air Service set various records for altitude, speed, and distance.[29] In 1923, Lt Oakley Kelly and Lt John Macready made a 2,520-mile flight from New York to San Diego in twenty-six hours and fifty minutes. Later in 1923, Lt. Lowell H. Smith and Lt. John P. Righter set a new endurance record by staying airborne for 37 hours and 15 minutes using aerial refueling.[30] In 1924, Air Service flyers completed the first around-the-world flight in 175 days, starting and ending in Seattle, Washington. The Air Service's exploits expanded the area of the air domain useable in conflict. The expanded physical environment would, in turn, affect the culture and missions of the Air Service.

Culture

The organizational structure of the Air Service imposed cultural constraints on the young service. Although the Air Service had its own Chief and Assistant Chief, placing tactical units under the command of ground commanders created tension between air offices and the General Staff. The hierarchical structure limited the Air Service's ability to define, theorize, and implement in the best means of accomplishing its task. Air officers argued that dividing up air wings amongst various army corps ignored the lessons from World War I: centralized control of air assets with a priority focus of operations against the enemy air force.[31] The decentralization of air assets emphasized ground commander control and relegated the Air Service to a subordinate combat arm.

The cultural challenge for the Air Service was determining its primary mission to

[28] Goldberg, 35.
[29] Goldberg, 34.
[30] Goldberg, 34.
[31] Goldberg, 30.

establish its own artifacts, espoused beliefs and values, and underlying basic assumptions unique from a ground-centric War Department. The War Department supported an emphasis on observation and pursuit missions, essentially using airpower as an auxiliary to ground forces. While some Air Service officers accepted the roles foisted upon them, others believed that an Air Service could provide independent utility separate from its ground mission. Brigadier General Billy Mitchell, Assistant Chief of the Air Service from 1920 to 1925, lobbied for the air arm to receive a significant role in national defense owing to the potential of strategic bombing.

Mitchell argued that strategic bombardment was a mission that belonged solely to an air force and should not be subservient to the army or navy. Beyond lobbying for independence from the Army, General Mitchell also believed that bombers negated sea power.[32] General Mitchell advocated for an independent service responsible for the coastal defense of the nation, as well as power projection to defeat the nation's enemies. Both Army and Navy leaders disagreed and denounced the effectiveness of strategic bombardment. Mitchell eventually obtained the chance to demonstrate the effectiveness of aerial bombardment, culminating with the sinking of the *Ostfriesland* in July 1921.[33] Despite the success of Mitchell's demonstration, the Army, Navy, and a bulk of the political leadership resisted efforts to create an independent air force. As a combatant arm within the USA, air officers belonged to two worlds. One world was the emerging one of daring, brash aviation explorers; the other was the tradition-laden ground-focused US Army. The cultural tension regarding the mission and identity of the Air Service would persist into the eventual United States Army Air Corps.

The United States Army Air Corps (USAAC) (1926 -1947)

In more of a lateral than a forward step, the Air Corps Act of July 2, 1926, created the United States Army Air Corps (USAAC) within the War Department by upgrading the Air Service to the Air Corps.[34] The USAAC transitioned the previous Air Service to a position in the War Department similar to that of the Marine Corps in the Navy Department. Following WWI, the persistent lobbying efforts of Air Force independence

[32] Goldberg, 31.
[33] Goldberg, 31.
[34] Goldberg, 36.

advocates such as Brigadier General Billy Mitchell, including his very public court-martial, demanded congressional action addressing the independence of the Air Service. Congress convened several boards to review the status of the air arm and provide recommendations on a way forward. In December 1925, the Lampert Committee commissioned by the House of Representatives "proposed a unified air force independent of the Army and Navy, plus a department of defense to coordinate the three armed forces."[35] While foreshadowing the eventual legislation of 1947, the recommendations of the Lampert Committee were untenable in an environment dominated by the War Department. The USAAC was a result of a counter-proposal by another board.

The Morrow Board, convened in September 1925 by President Calvin Coolidge, recommended renaming the Air Service as the Air Corps to give it more prestige.[36] President Coolidge created the board to study the best method of using aircraft in defense of the nation. Rejecting the proposal of the Lampert Committee, the Morrow Board argued that the new Air Corps should have increased representation via an Assistant Secretary of War for air affairs and special representation on the General Staff. Congress adopted the ideas of the Morrow Board when it officially created the USAAC. While not the definitive independent service crusaded for by General Mitchell, the USAAC did create an avenue of autonomy that Air Corps leaders could build upon towards independence.

Organization

The Air Corps Act of 1926 did not change the role of USAAC within the USA but sought to increase the prestige of the air arm and impede calls for an independent air force. The act created a new position of Assistant Secretary of War for Air as well as positions for two additional brigadier generals on the General Staff.[37] Additionally, the Air Corps Act established an air section in each of the divisions of the War Department under the leadership of an Air Corps Officer.[38] The Air Corps Act also authorized the USAAC to execute a five-year expansion program. The five-year expansion program enabled the USAAC to counter budgetary constraints imposed by the War Department

[35] Goldberg, 36.
[36] Goldberg, 36.
[37] Goldberg, 37.
[38] *The Question of Autonomy for the United States Air Arm 1907-1945: Pt 2*, 272.

and grow the organization as needed to fulfill its mission. The expansion authorized an increase of 403 officers and 6240 enlisted.[39] Also, the expansion authorized the Air Corps to maintain up to 1,800 airplanes and as many airships or balloons necessary for training.

Although the USAAC never attained its end strength goal in personnel and aircraft, it did grow significantly. The Air Corps increased from 919 officers, 8,725 enlisted personnel, and less than 1,000 total aircraft in 1926 to 1,305 officers, 13,400 enlisted personnel, and 1,709 aircraft by 1932.[40] The number of squadrons increased from 27 to 45, made up of four attack, 12 bombardment, 16 pursuit, and 13 observation squadrons.[41] The Air Corps Act renamed the Air Service Tactical School located at Langley Field, Virginia to the Air Corps Tactical School. Continuing the emphasis in training, the Air Corps Training Center opened at Randolph Air Force Base, San Antonio, Texas, in 1930 as the centralized location for primary and advanced flight training, as well as a school for aviation medicine.[42] The continued focus on training and education enabled the Air Corps to increase the caliber and quantity of air officers.

Technology

The focus on aircraft research and design that began with the Air Service continued in the Air Corps, resulting in bigger and faster airplane bombers. Aircraft transition to all-metal airframes and engines produced more horsepower. As such, the performance gap between bombers and pursuit aircraft shrank noticeably. For example, the B-10 two-engine all-metal monoplane featured a top speed above 200 miles per hour and a service ceiling of 28,000 feet.[43] Better engines also resulted in increased range for observation aircraft. Other significant technological advances during the Air Corps era included the controllable pitch propeller, retractable landing gear, and improved bombsight. The successful production of bigger and faster bombers, in turn, fueled the demand for even more performance from aircraft. The sky was no longer the limit, but merely a challenge to be conquered.

Physical Environment

Air officers in the Air Corps capitalized on technological advances to set new

[39] *The Question of Autonomy for the United States Air Arm 1907-1945: Pt 2*, 275.
[40] Goldberg, *A History of the United States Air Force 1907-1957*, 36–37.
[41] Goldberg, 36–37.
[42] Goldberg, 37.
[43] Goldberg, 38.

records and increase mastery of the air domain. On June 28, 1927, Lt Lester Maitland and Lt Albert Hegenberger flew 2,418 miles nonstop in a Fokker monoplane from Oakland, California, to Hawaii.[44] In January 1929, the Air Corps set a new endurance record when the *Question Mark*[45] stayed aloft for 151 hours using aerial refueling.[46] Not to be outdone, Lt Col Arnold completed an 8,290-mile round trip in 1934 using B-10 bombers as transport aircraft to test the possibility of resupplying outposts via the air.[47] One leg of the journey included flying non-stop over water from Juneau, Alaska to Seattle, Washington. The aviation spirit was in full bloom in the Air Corps era, and aviators continued to push boundaries. Technology and daring freed aircraft from overland restrictions. As confidence in overwater operations increased, the domain of the Air Corps encroached upon Naval Aviation. The Navy considered all airspace over water as within the purview of Naval aviation. Army planes could transition through it, but combat operations over water belonged to the Navy. The tension arose because, before operations in the air, domains were clearly defined between the War Department (land) and the Department of the Navy (water). The sharing of the air domain was a new tension that threatened the Navy. Chapter 4 will delve deeper into this issue.

Culture

The era of the Army Air Corps experienced significant cultural changes that permeated the USAF. Air officers continued to take risks and seek new exploits in the air domain. Despite the dangers inherent in flying, young men flocked to join the ranks as aviation cadets. The Air Corps Training Center, referred to as the "West Point of the Air," went a long way in changing the culture of the Air Corps.[48] The close coordination enabled by concentration at one location under a single commander fostered a sense of cohesion. Additionally, the doctrinal focus of the Air Corps Tactical School (ACTS) changed. ACTS moved from Langley Field, Virginia to Maxwell Field, Alabama in 1931 in a search for better infrastructure. The move coincided with doctrinal changes.

ACTS previously emphasized pursuit aviation as the most essential air mission.

---

[44] Goldberg, 37.

[45] The Question Mark was a modified Atlantic-Fokker C-2A transport airplane. The crew included future USAF leaders such as Maj. Carl Spaatz, Capt. Ira Eaker and Lt. Elwood R. Quesada

[46] Goldberg, *A History of the United States Air Force 1907-1957*, 37.

[47] Goldberg, 38.

[48] Air Force Historical Research Agency, "The Birth of the United States Air Force."

Shortly after the passage of the Air Corps Act, ACTS began emphasizing the importance of attacking vital points deep within enemy territory rather than a war of attrition focused on attacking the enemy's military forces. Confidence in emerging bomber technology encouraged the doctrinal preaching that the bomber would always get through. The Air Corps changed its espoused beliefs and underlying assumptions, eroding the importance of pursuit aviation and advancing independent strategic bombing as a foundational principle. By 1931, technology made the theoretical aspirations of Giulio Douhet a near-certain reality.

Douhet was an Italian airpower theorist whose seminal work, *The Command of the Air,* had a lasting impact on airpower employment. Douhet posited that airpower provided a means of achieving a quick victory in war by bombing the enemy's vital centers.[49] Douhet stated that enemies could not adequately defend against a massive bombing campaign.[50] Writing in 1921, Douhet overestimated the efficacy of bombs based on accuracy and destructive power. However, technological advancements increased the feasibility of Douhet's theories. ACTS doctrines encouraged the belief and assumption that a well-coordinated air attack was near-impossible to defeat. Additionally, two policy changes bolstered the cultural change of the Air Corps.

Increased confidence in Air Corps capabilities increased the Air Corps' ability to implement its theorized solutions air defense. In January 1931, General Douglas Macarthur, Chief of Staff of the US Army, and Admiral William V. Pratt, Chief of Naval Operations for the US Navy, agreed that the Army Air Corps would assume responsibility for land-based air defense of the coasts of the United States and its overseas possessions.[51] Furthermore, in January 1933, the War Department formally specified the role of Army aviation to include long-range reconnaissance and operations limited only by the range of aircraft.[52] Capitalizing on the capabilities of long-range aircraft, the Air Corps was free to pursue operations well beyond the front lines. These changes freed the Air Corps to implement the solutions theorized at ACTS. No longer were operations limited to the scope of ground commanders. General Mitchell's dreams

[49] Giulio Douhet, *The Command of the Air* (Tuscaloosa, A.L.: The University of Alabama Press, 2009), 28.
[50] Douhet, 37.
[51] Goldberg, *A History of the United States Air Force 1907-1957*, 38.
[52] Goldberg, 38.

were becoming a reality. The freedom to pursue missions not tied directly to ground forces emboldened the Air Corps to form a striking force that relied on long-range observation and bombardment aircraft to defend against seaborne attacks.[53] This desire for a strike force under the top command of the US Army coalesced into the General Headquarters Air Force.

General Headquarters Air Force (GHQAF) (1935-1941)

On March 1, 1935, the War Department established the General Headquarters Air Force (GHQAF) as a means to increase the autonomy of the Air Corps while staving off full independence. The idea for the GHQAF started in 1933. While the Army was considering a departmental reorganization, the Air Corps floated the proposal of a GHQ Air Force. For the Air Corps, the motivation behind the GHQAF was the desire to pursue missions not tied directly to ground forces. Enabled by the emergence of long-range heavy bombers, airmen sought to create a striking force that relied on long-range observation and bombardment aircraft to defend against seaborne attacks. A War Department board chaired by Deputy Chief of Staff Maj Gen Hugh Drum reviewed the Air Corps proposal. The board endorsed the idea of a GHQ Air Force used for "tactical and strategic operations, including attacks on major installations in enemy territory."[54] A subsequent board in 1934 chaired by former Secretary of War Newton D. Baker rejected the idea of an independent air force but recommended the creation of a GHQAF "comprised of air combat units and capable of operating either independently or in cooperation with the ground forces."[55] Following these two recommendations, the GHQAF was born. The GHQAF assumed command over the Air Corps tactical units.[56]

Organization

The War Department created the GHQAF as an adjunct combat organization to the Air Corps. GHQAF did not replace the Air Corps. Eventually renamed Air Force Combat Command in 1938, the GHQAF and the Air Corps were at times co-equal he and

[53] Goldberg, 39.
[54] Goldberg, 39.
[55] Goldberg, 40.
[56] Air Force Historical Research Agency, "The Birth of the United States Air Force."

at other times GHQAF reported to the Air Corps.[57] The Chief of the Air Corps and the GHQAF both reported to the Chief of Staff of the Army. In a convoluted chain of command, the GHQAF was under the control of the General Staff in peacetime and a theatre commander in time of war for tactical training and employment. Administrative matters on tactical bases were handled by Army Corps area commanders. Finally, GHQAF supply and training came under the control of the Chief of Air Corps.[58] To resolve the discordant organizational structure, the Chief of the Air Corps assumed control over the GHQAF in March 1939.[59] This organizational change eliminated administrative and operational tension between GHQAF and the rest of the Air Corps. The entire Air Corps was under the direction of a single leader. The GHQAF comprised of three combat wings located at Langley Field, Virginia, Barksdale Field, Louisiana, and March Field, California.[60]

Technology

The technological focus of the GHQAF was on heavy bombers. The GHQAF sought to develop a suitable heavy bomber that would prove the belief in an offensive, independent mission for the GHQAF. The GHQAF invested heavily in developing numerous bombers. The most successful heavy, long-range bomber at this time was the B-17. The B-17 was a four-engine bomber that demonstrated its capability by flying non-stop from Seattle to Dayton, 2,100 miles, at an average speed of 232 miles per hour.[61] Besides the B-17, the Air Corps also invested in the XB-15 and the XB-19. The XB-15, termed Project A, was a bomber with a 5,000-mile range, an average speed of 200 miles per hour, and a 2,000-pound bomb payload.[62] The XB-19 was an experimental bomber with a 212-foot wingspan and a 160,000-pound gross weight. Both the XB-15 and the XB-19 got to the prototype phase but were too heavy to go into mass production. The experimental airplanes were too big and heavy for the limited performance capability of exiting engines. The GHQAF did not abandon the efforts but continued research into

[57] John L. Frisbee, "The GHQ Air Force," Air Force Magazine, August 29, 2008, https://www.airforcemag.com/article/0983ghq/.
[58] Goldberg, *A History of the United States Air Force 1907-1957*, 41.
[59] Goldberg, 41.
[60] Goldberg, 40.
[61] Goldberg, 41.
[62] Goldberg, 40.

developing better engines. The XB-15 and XB-19 contributed significantly to the eventual production of the B-29 and B-36 heavy bombers.

The GHQAF emphasis on heavy bombers meant a decreased emphasis on attack and pursuit aircraft. Research and development funneled funding into bigger and faster attack and pursuit aircraft but at a much lower rate than bombers. Designs for the P-39, P-40, and P-38 aircraft began in 1936-37. The decreased funding meant that by 1941, the previously built P-36 was still the standard fighter for the Air Corps. Attack aircraft received more emphasis from the War Department and as such the Air Corps than fighter aircraft. The A-17 was the standard attack plane, but the Air Corps also had the B-20, B-25, and B-26 for use as tactical bombers; the B-20, B-25, and B-26 were two-engine bombers purchased ready for use off the production line.[63] Limitations on B-17 funding by the War Department meant that by late 1939, the B-18 was the standard bomber for the Air Corps as there were only 23 B-17s. As the war in Europe erupted, only the B-17 was superior to any airplane possessed by allies and adversaries.

Physical Environment

The GHQAF era furthered the battle over ownership of the air domain. In May 1938, a verbal agreement between the Chief of Staff of the Army and the Chief of Naval operations limited the Air Corps to operational flights no further than 100 miles offshore.[64] The restriction imposed on the Air Corps stemmed from naval complaints following the successful interception by three GHQAF B-17s of the Italian liner *Rex* over 700 miles off the coast of New York.[65] The Navy felt that GHQAFs operations strayed too far into the Navy's domain. Going forward, operations in the air above the ocean resided squarely in the domain of the Navy.

Culture

During the GHQAF era, the espoused beliefs and underlying assumptions of the Air Corps clashed with those of the Army. The Army maintained a mindset of organizing and equipping the force for defensive operations. As such, the War Department countered Air Corps attempts to further research and development efforts into long-range bombers. In 1938, Secretary of War Harry H. Woodring directed the Air Corps to confine its

[63] Goldberg, 44.
[64] Goldberg, 43.
[65] Goldberg, 43.

bomber estimates to light, medium, and attack bombers.[66] The Army pushed for more B-18 two-engine bombers versus the more expensive four-engine B-17 bomber. The Air Corps countered that the B-17 was necessary for coastal defense. The eventual 100-mile agreement between the Army and the Navy blunted the Air Corps' claim that it needed long-range bombers for coastal defense. The Army imposed its defensive assumptions on the Air Corps; the Air Corps struggled to find a means to advocate for its offensive belief in the primary of long-range bombers.

Although the Air Corps acknowledged a need to perform pursuit, attack, and reconnaissance missions, its doctrinal focus and underlying assumptions focused on strategic bombing. Technological advances increased the speed of bombers to that matching pursuit aircraft. Air Corps doctrine at ACTS lagged in the areas of tactical aviation. Assumptions emerged that increased bomber performance negated fighter escorts. The Air Corps' emphasis on defining, theorizing, and implementing solutions sought an expeditious victory through strategic bombing. The War Department sought to use funding restrictions to force the Air Corps into changing its priorities, and the Air Corps searched for a way to prove their position. The war in Europe was an appropriate justification for Air Corps priorities. In response to international threats, the US needed to increase and extend the range of its defensive capabilities. The solution was long-range bombers.

United States Army Air Forces (USAAF) (1941-1947)

On June 20, 1941, the War Department created the Army Air Forces (AAF) to increase the autonomy of the air arm and provide centralized command of the Air Corps and the Air Force Combat Command.[67] Army Regulation 95-5 created the AAF headed by a Chief, General Henry "Hap" Arnold, who was dual-hatted as the Deputy Chief of Staff for Air for the US Army.[68] A subsequent reorganization of the War Department in March 1942 made the Army Air Forces coequal with the Army Ground Forces and Army Service Forces. In 1943, Army Field Manual 100-20, Command and Employment of Air Power, acknowledged land power and air power as coequal and interdependent, with

[66] Goldberg, 43.
[67] Goldberg, 99.
[68] Goldberg, 51.

neither being auxiliary to the other.[69] The newly elevated AAF also merged all elements of the air arm under one commander and dissolved the position of Chief of the Air Corps and Air Force Combat Command. The War Department reorganization could not do away with the Air Corps as it was ordained by law and would require legal change to eliminate it.

Although they did not have an independent air force, General Arnold and other AAF leaders contented themselves with the quasi-autonomy of the AAF as they felt that World War II (WWII) took precedence to undertaking a massive reorganization. The mission of the AAF was to "procure and maintain equipment peculiar to the Army Air Force, and to provide air force units for assignment to combat."[70] Blossoming during WWII, the AAF significantly contributed to the Allied victory. General Arnold argued that one of the greatest lessons of WWII was that "air superiority was a prerequisite to any successful ground or naval action."[71] As WWII concluded, political leaders and senior military leadership in the war department did not want to revert to the prewar organization. The First War Powers act of 1941 enabled President Wilson to delegate authority to the War Department, which resulted in the establishment of the AAF. To become a permanent fixture, the autonomy of the AAF required legislative action, or else the AAF would disband six months after the cessation of conflict.[72] Legislative action arrived in the form of the National Security Act of 1947.

Organization

The AAF bore the closest semblance to a separate air force. The elevation of the AAF as a co-equal force within the Army allowed it to operate with near autonomy. The AAF increased the role of the Assistant Secretary of War for Air. In 1941, the AAF established four numbered air forces split amongst the four corners of the US, driven by the concern over managing continental defense. Each numbered Air Force organized its own bomber and interceptor command to provide offensive and defensive task forces. The reorganization did not address the question of command relationships between the field army and the numbered air force; however, the war department expected

[69] Goldberg, 100.
[70] Goldberg, 96.
[71] Goldberg, 97.
[72] Goldberg, 100.

cooperation.[73] The AAF experienced multiple reorganizations to maximize efficiency and manage growth in the prelude and execution of WWII. For example, the AAF divided the Materiel Division into Air Corps Maintenance Command and Air Service Command; Air Corps Maintenance Command handled the increased volume of aircraft maintenance that accompanied the increase in the size of the AAF. As the AAF ascended to its quasi-autonomous status, the War Department responded by creating a division of Organic Aviation. Chapter 4 will delve further into the role of Organic Aviation in the army

Technology

The technological developments during the AAF era focused on the capabilities necessary to win WWII. The Axis powers presented a real threat that technologies could be tested against to get practical and not theoretical results. AAF increased funding for better bombers and fighters. The AAF successfully fielded the B-29 bomber and P-51 Mustang fighter. The AAF also implemented better bomb-sights, improved RADAR capabilities, drop-tanks for fighters, and incendiary munitions. Despite the varied development in technology, the bulk of AAF funding was still in long-range bombing. The B-29 and the bombs it dropped consumed the majority of AAF funding. This included the atomic bomb.

Physical Environment

The main change in the physical environment of the AAF was the expansion of overseas bases and air routes. The AAF built additional bases in Greenland, Puerto Rico, and Iceland.[74] The additional bases were an attempt to extend the defensive coverage of the AAF. The AAF could increase its coastal defense operational capability with more island and overseas bases than operating primarily from the continental US. Additionally, the AAF established and increased overseas air routes which enabled the ferrying of aircraft to overseas locations in support of the war effort. The air routes extended to Britain, Africa, South America, the South Pacific, the Middle East, and South-East Asia.

In support of the war effort, the AAF conducted operations over water. These included mining harbors and shipping interdiction. Most of the operations were within the 100-mile offshore range.

[73] Goldberg, 51.
[74] Goldberg, 52.

Culture

WWII provided a way for the AAF to implement its belief in the best use of Airpower. The organizational freeing of the AAF enabled the organization to further its underlying assumption that strategic bombing could provide command of the air. Doctrine advocated for self-defending bombers capable of accurately delivering deadly bombs.[75] The AAF advocated the use of strategic bombing to destroy the enemy's airpower by destroying airplanes and airfields.[76] Similarly, strategic bombing would destroy the enemy's war-making capability by attacking targets deep within enemy territory.[77] Air War Plans Division's (AWPD/1) chosen targets included oil refineries, munition factories, and aircraft production sites.[78] The ACTS did not advocate the intentional terror bombing of the populace; the intent was to erode the enemy's will to fight by crippling the enemy's war-making capability.[79] WWII enabled the AAF to test out and refine theories developed at ACTS.

The AAF overestimated the success of bomber attacks. Enemy air defenses, fighters, and anti-aircraft guns destroyed more aircraft than ACTS expected.[80] The bomber did not always get through by itself, and bombs were not as accurate nor as destructive as expected.[81] Bombing technology still needed further development. The over-focus on bomber capabilities resulted in a lag in fighter capabilities.[82] Severe aircraft losses during WWII forced the AAF to rebalance its focus. For example, in 1943, during a bombing mission on a German ball-bearing factory in Schweinfurt, the attacking AAF bomber force suffered severe losses—198 of the 291 bombers launched were either shot down or damaged.[83] The AAF lost 16 percent of the attacking bomber force to enemy defenses. In response, the AAF changed tactics to ensure bombers had fighter escorts.[84] Doctrinally, the AAF realized the importance of attaining command of the air through a

[75] Tami Davis Biddle, *Rhetoric and Reality in Air Warfare: The Evolution of British and American Ideas about Strategic Bombing, 1914-1945*, Princeton Studies in International History and Politics (Princeton, N.J.: Princeton University Press, 2004), 205.
[76] Biddle, 168.
[77] Biddle, 209.
[78] Biddle, 206.
[79] Biddle, 206.
[80] Biddle, 291.
[81] Biddle, 211.
[82] Biddle, 207.
[83] Biddle, 224.
[84] Biddle, 227.

balanced force. Effective strategic bombing required air superiority. Air superiority could be achieved either by negating or overwhelming the enemy's air defenses. As bombers had to fly within the threat area of the enemy's air defenses, fighter escort increased in priority. The AAF adapted its espoused beliefs to increase the importance of fighter escorts.

The United States Air Force (USAF) (1947 – Present)

The NSA of 1947 was the culmination of the long-waged war for a separate air force. Title II, Section 207 of the NSA established the Department of the Air Force within the National Military Establishment.[85] Section 208 created the USAF under the Department of the Air Force and transferred the AAF, Air Corps, and GHQAF (Air Combat Command) to the USAF.[86] The new service's organization, technology, physical environment, and culture reflected its evolution from its Signal Corps beginnings.

Organization

The USAF's organization reflected efforts begun under the AAF during the war. AAF leaders such as Generals Arnold and Spaatz started post-war organizational planning for an eventual independent Air Force. The AAF organized combat forces under strategic air command (SAC), tactical air command (TAC), and air defense command (ADC).[87] The USAF maintained the bulk of AAF's organizational efforts and maintained SAC, TAC, and ADC as the major combat commands.[88] After the war, SAC continued to grow in prominence and eventually became the dominant command within the USAF.[89] The growth of SAC resulted in a decrease in emphasis on TAC.

In mid-1947, General Spaatz activated a plan for 70 groups in the AAF anticipating the creation of the USAF: 21 very heavy bomber, 22 fighter, five light bomber, four tactical reconnaissance, 10 troop carrier, three all-weather fighter, two long-range photo-reconnaissance, one long-range mapping, and two long-range weather

---

[85] "The National Security Act of 1947 – July 26, 1947," CIA.GOV, accessed January 30, 2020, https://www.cia.gov/library/readingroom/docs/1947-07-26.pdf.
[86] "The National Security Act of 1947."
[87] Walter J. Boyne, *Beyond the Wild Blue: A History of the United States Air Force, 1947-1997*, 1st ed (New York: St. Martin's Press, 1997), 29–30.
[88] Wolk, *The Struggle for Air Force Independence, 1943-1947*, 197.
[89] Boyne, *Beyond the Wild Blue*, 30.

reconnaissance.[90] Only 55 of the 70 groups were actively manned and only 36 of those were operational. The operational groups comprised eight heavy bomber, 15 fighter, three light bomber, two tactical reconnaissance, six troop carrier, one long-range photo-reconnaissance, and one long-range mapping.[91] After the establishment of the USAF, Spaatz and SECAF Symington advocated for 70 groups, but budget constraints prevented the USAF from ever attaining its plan for 70 groups. The USAF requested a budget of $4.21 billion but only received $2.904 billion.[92] By December 1947, the budget limitations enabled only 47 operational groups. Suffering under budget limitations, the USAF made technological compromises in line with its stated mission.

Technology

During its early period, the USAF's technological focus resided in bombers and fighters. The USAF sought long-range bombers that could penetrate deep into enemy territory to deliver devastating atomic munitions. For example, the B-47 was a six-jet engine strategic bomber with high-mounted swept wings, a maximum gross weight of 204,000-pounds, a 3,500-nm range, and could carry up to 20,000-pounds of munitions internally.[93] B-47 Stratojet research began in 1945, achieved its first flight in December 1947, and entered operational service in 1952.[94] The end of WWII ushered in the age of atomic warfare. The US continued research in atomic weapons and developed larger and more devastating thermonuclear bombs. The MK-17, the first operational thermonuclear bomb in the USAF, was in service from 1954 to 1957.[95] The USAF sought to maintain the edge in nuclear weapons over the Soviets by continuing to research more powerful bombs. Continued research into thermonuclear weapons resulted in smaller munitions with equally devastating results.[96] The decrease in size of munitions meant that B-47s could carry more individual thermonuclear weapons on strategic missions. Similarly, the

[90] Herman S. Wolk, "Planning and Organizing the Postwar Air Force 1943-1947" (Office of Air Force History, USAF, 1984), 215, https://media.defense.gov/2010/Sep/28/2001329803/-1/-1/0/planning_and_organizing_the_postwar_af.pdf.
[91] Wolk, 215.
[92] Wolk, 218.
[93] "B-47 Stratojet United States Nuclear Forces," Federation of American Scientists, accessed April 6, 2020, https://fas.org/nuke/guide/usa/bomber/b-47.htm.
[94] "B-47 Stratojet United States Nuclear Forces."
[95] "Mark 17 Thermonuclear Bomb," National Museum of the United States Air Force™, May 29, 2015, http://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/197628/mark-17-thermonuclear-bomb/.
[96] "B-47 Stratojet United States Nuclear Forces."

USAF continued research in faster and more capable fighters.

Physical Environment

The establishment of the USAF did not change the domain claim of the USAF. As the USAF received its writ of ownership to the air domain, the service had to decide what to emphasize within the air domain. The USAF emphasized using the air domain for long-range, high-speed, and high-altitude missions over low-altitude and slow-speed missions. As aircraft capability increased, over-water aviation capability increased and the USAF's physical domain clashed with the Navy's. This competition over physical domain jurisdictional claim was a focus item of the Key West Agreement of 1948 and will be covered in detail in the next chapter.

Culture

Establishing the USAF solidified the culture of the USAF that was established by the AAF. Most of the USAF's cultural artifacts stemmed from the US Army: airplanes, bases, stories, and history. The new service sought to establish its own culture through uniforms, organizational layout, and patterns of organizational behavior.[97] The USAF sought to bake in its belief about the proper use of airpower and the role of the USAF in its culture. The USAF's espoused beliefs were that airpower was best when centrally controlled and strategic airpower was the appropriate way to win wars. These beliefs coalesced within the major command of SAC. The SAC mindset centered around the importance of the bomber force and strategic airpower in defending the nation and winning the nation's wars.[98] SAC presented a war-winning capability and supported the underlying assumptions that the USAF could win the nation's wars alone.

The end of WWII and the advent of atomic weapons supported the devastating air power theories of Douhet. Atomic weapons delivered by long-range bombers could destroy entire cities and destroy the enemy's will and war-making capability. Likewise, enemy long-range bombers threatened the US and could not be stopped by the natural barriers of the Atlantic and Pacific Oceans. The Air Force pushed the notion that future wars would be fast and devastating, and the USAF, SAC, needed to be ever-ready to

[97] Boyne, *Beyond the Wild Blue*, 38.
[98] Boyne, 99–100.

respond.[99] Outside the USAF, others held similar views. Army Generals Marshall and Eisenhower fully supported an independent Air Force, coequal with the Army and Navy.[100] Congress and the public also supported a separate Air Force that could fully exploit the advantage of the air domain.[101] The Air Force and its bomber force were the nation's guards ready to wage war at a moment's notice. The resulting Air Force identity was both an expression of the USAF's culture and a mirroring of the service's external image. The USAF's identity was rooted in strategic airpower.

Conclusion

By the time the NSA of 1947 established the USAF, the new service's identity was that of an independent force capable of providing decisive war-winning effects. The evolution of the eventual USAF identity illustrates the identity-mediated relationship of culture and image depicted by Hatch and Schultz. The Air Service's identity mirrored the externally held image of the Air Service as an auxiliary to ground forces. The resulting mirrored identity attempted to embed itself within the Air Service's culture. Air officers who adopted the War Department's underlying assumption of the auxiliary role of airpower reflected the image-laden identity on the air component's culture. In the Air Service, the cultural clash occurred between air officers who espoused different beliefs. Air officers seeking autonomy eventually gained more power as they moved up the ranks. The growth in power of autonomy-seeking air officers expressed new cultural understandings on the air component's identity. In turn, the independence-seeking identity expressed left an expression on politicians. This expressed identity changed the externally-held image held by politicians and some within the War Department.

The iterative culture-identity-image cycle continued through the Air Corps, GHQAF, and the AAF. Air officers advocating independence gained more power and slowly changed the cultural expressions of the air arm. The identity of the air component changed as the externally-held image of the air component changed. The successful contribution of the AAF in WWII helped shape the image of the AAF. The signing of the NSA of 1947 and the establishment of the USAF revealed the synchronization of the

[99] Boyne, 97.
[100] Wolk, "Planning and Organizing the Postwar Air Force 1943-1947," 210.
[101] Wolk, 210.

USAF's culture and the image of the USAF held by others. Although there was agreement on the need to establish a separate service, there was still disagreement over the roles and missions of the new service.

The professional tasks that comprised the USAF evolved from the time of the Air Service through the AAF. As the objective and subjective foundations of the air component's tasks evolved, the burgeoning service adopted increasingly complex roles and missions. The Signal Corps Act gave the Signal Corps jurisdiction of military aviation. Responsibility for defining the roles and missions for the profession of military aviation resided with the Air Service. Charting the evolution of the USAF from the Air Service to the AAF, the driving force for change was the underlying assumption that airpower could provide decisive results independent of ground and naval forces.

The underlying assumption of independence spurred the organizational changes that accompanied the responsibilities and size. Similarly, the cultural belief in the capability of airpower charted the course of technological innovations. Upon learning the limits of strategic bombing imposed by technological limits, the AAF increased its development of fighter and aviation to increase overall AAF mission effectiveness. The US Army Signal Corps established the initial physical environment of the USAF as from the surface of the earth and above. The challenge by the Navy to prevent AAF operations above the ocean would continue into the USAF. The importance of airpower as a war-winning effort threatened sacred naval missions such as sea interdiction. Similarly, as the Navy sought to increases its share of budget funding, it would battle the USAF over aerial authority in littoral areas.

WWII established the USAF's identity as an independent force capable of providing decisive war-winning effects. The USAF felt that it could work with the other services but was best able to defend the nation against long-range bombers, as well as project power to destroy the nation's enemies. The AAF explored the limits of strategic bombing, and the atomic age reinvigorated the belief in strategic bombing. The USAF's role as the nation's Air Force required the USAF to win the nation's war via the air, defend against enemy air forces, and provide support to the other services.

Chapter 4

Dividing the Air

> *In order to assure an adequate national defense, it is necessary — and sufficient — to be in a position in case of war to conquer the command of the air.*
>
> *General Giulio Douhet*

The establishment of the USAF reverberated within the Department of Defense. The newly minted service upended long-established traditions built around two warfighting departments. The introduction of the Department of the Air Force affected budget allocation, roles, and missions of the Departments of the Army and Navy. As a young service, the USAF fought to assert its role within the DoD. The USAF asserted its independence by emphasizing its strategic war-winning capability provided by long-range bombers and nuclear weapons. The USAF fought off attempts by the Army and Navy to intrude on strategic mission sets. This chapter delves into the challenges of dividing the roles and missions of aviation. Budgetary concerns affected all three services as they sought to lay claim to more responsibilities. The bulk of budget dollars went to support aviation. The tension between the Army and Air Force offers lessons for the Air Force and Space Force going forward.

The Army did not challenge the USAF's role as the nation's air force, but the Army still wanted to retain aspects of aviation. The Army is a better case study for the Air Force than the Navy because the establishment of the Air Force directly eliminated Army Air Forces (AAF) but did not eliminate naval aviation. The Navy, and by extension the Marine Corps, retained control of naval aviation. This chapter helps to explain how and why. However, this chapter will not individually breakout each of the four theoretical lenses when analyzing Naval Aviation. The establishment of the Air Force affected the Navy as an entire service and not naval aviation specifically as naval aviation was always separate from the AAF. Mark Vital's paper, *The Key West Agreement of 1948: A Milestone for Naval Aviation*, provides a superb and sufficient in-depth analysis of the effects of the Air Force on naval aviation.[1] This chapter delves into the relevant aspects

[1] Mark D. Vital, "The Key West Agreement of 1948: A Milestone for Naval Aviation" (Master's Thesis, Florida Atlantic University, 1999).

of the Air Force and Navy jurisdictional battles without recreating a detailed analysis of naval aviation as the focus of this work is the effects on Army Aviation.

Section 208(f) of the NSA of 1947 detailed the mission of the USAF in vague terms: “In general the United States Air Force shall include aviation forces both combat and service not otherwise assigned. It shall be organized, trained, and equipped primarily for prompt and sustained offensive and defensive air operations. The Air Force shall be responsible for the preparation of the air forces necessary for the effective prosecution of war except as otherwise assigned and, in accordance with integrated joint mobilization plans, for the expansion of the peacetime components of the Air Force to meet the needs of war.”[2] While it specifically assigned the USAF combat aviation forces, it did not award the USAF *all* aviation forces. The Army and Navy retained organic aviation components as “otherwise assigned.”

The interservice competition between the Army, Navy, and Air Force was a fight for professional jurisdictional control. All three services served to protect the nation, and all three services wanted to use airpower to achieve their purpose. The formal jurisdiction granted by the NSA of 1947 did not erode the informal structures already in existence. Viewing each service as a profession, all three services competed for an expanded share of formal aviation jurisdictional rights. The following sections on naval aviation and organic Army aviation illustrate the multiple attempts to clarify which service had jurisdictional control over specific elements of airpower. The sections will use historical examples to show how the Navy and Army adapted their organization, technology, and physical environment to support their claims over specific aviation roles and missions. Leaders in each service sought to meld the culture of their respective service with external demands stemming from legislation.

Naval Aviation

According to the NSA of 1947, naval aviation retained its autonomy from the newly minted USAF. Section 205(b) of the NSA stated the following: "All naval aviation shall be integrated with the naval service as part thereof within the Department of the

[2] “The National Security Act of 1947 – July 26, 1947,” CIA.GOV, accessed January 30, 2020, https://www.cia.gov/library/readingroom/docs/1947-07-26.pdf.

Navy. Naval aviation shall consist of combat and service and training forces and shall include land-based naval aviation, air transport essential for naval operations, all air weapons and air techniques involved in the operations and activities of the United States Navy, and the entire remainder of the aeronautical organization of the United States Navy, together with the personnel necessary therefor."[3] In an attempt to elucidate the functions of the USAF, President Truman signed Executive Order 9877. The specific function of the USAF included "air support to land forces and naval forces, including support of occupation forces;" air transport for the armed forces, except as provided by the Navy;" "to assist the Army and Navy in accomplishment of their missions, including the provision of common services and supplies as determined by proper authority."[4] The convergence of Air Force and Navy missions created inter-service tension.

The primary tensions between the Air Force and naval aviation revolved around budgetary concerns and the role of strategic airpower. WWII demonstrated air as a dominant element in future warfare. Additionally, the inclusion of atomic weapons in warfare increased the demand and importance of strategic warfare. The Navy sought to accomplish its air mission through aircraft carriers; the Air Force viewed large carrier task forces as incapable of accomplishing long-range strategic air operation and advocated for long-range bombers. One of the primary supporting arguments for the USAF's independence was the promise of the independent war-winning capability of strategic bombing. Although the USAF fielded assets that accomplished other missions that supported the other two services, strategic bombing was a unique mission that the Air Force argued only it was suited to perform.

The destructive power of atomic weapons and the necessity of long-range bombers capable of delivering atomic weapons increased the priority of funding strategic warfare in the defense budget. The USAF argued that executing strategic bombing demanded research and development of long-range bombers such as the B-36.[5] The large cost of such projects placed budgetary concerns at the forefront of interservice disputes. The military services understood that all three services had to divide limited defense

[3] "The National Security Act of 1947."
[4] Alfred Goldberg, *A History of the United States Air Force 1907-1957* (Princeton, N.J: D. Van Nostrand Company, INC, 1957), 103.
[5] Goldberg, 116.

funds amongst themselves. However, the lack of clear delineation between the functions of the different services meant that both the Navy and the Air Force retained legitimate claims to pursuing their different strategies. To resolve differences regarding the delineation of missions, Secretary of Defense James Forrestal held conferences in Key West, Florida, and Newport, Rhode Island, with the Joint Chiefs of Staff in 1948. The result of these conferences was a document titled *Functions of the Armed Forces and the Joint Chiefs of Staff,* colloquially referred to as the Key West Agreement of 1948.[6]

The Key West Agreement of 1948 sought to define the functions of the armed forces clearly, but it did not end the inter-service rivalry over missions and budget. As a result of the Key West agreement, President Truman revoked Executive Order 9877, which had previously specified the functions and roles of all three services. Although the agreement listed specific functions for the different services, Forrestal demanded that each service assist the operations and provide mutual support for each other's mission.[7] Forrestal demanded a "consonance and correlation of policies and procedures" to "produce an effective, economical, harmonious and businesslike organization" within the NME.[8] The agreement assigned primary responsibility for strategic warfare to the Air Force and control of the seas, and the air above the seas, to the Navy.[9] Although the Navy signed on to the agreement, it continued to fight the strategic warfare problem.

The Key West agreement achieved its objective of delineating service functions, but it did not end interservice rivalry stemming from roles and missions. Service functions are akin to Abbott's specific purpose of a profession. Just as professions use controlled knowledge to accomplish a specific purpose or core tasks, so too do the services use controlled knowledge and resources to achieve a specific function. Jurisdictional authority gives a service the power to define, theorize, and implement means to achieve its assigned functions via roles and missions. While the Key West agreement delineated which service was responsible for which functions, it did not resolve the ambiguity inherent in services arriving at the same roles and missions to

---

[6] Goldberg, 116.
[7] Harry S Truman, "Key West Agreement of 1948: Functions of the Armed Forces and the Joint Chiefs of Staff," April 21, 1948, 4, http://cgsc.cdmhost.com/utils/getfile/collection/p4013coll11/id/729/filename/730.pdf.
[8] Truman, 3.
[9] Truman, 11.

fulfill *different* functions. For example, one of the Navy's assigned functions was to conduct land and air operations as necessary for a naval campaign.[10] While the Navy retained autonomous control over its air arm, it was excluded from developing strategic air assets. Both the Air Force and the Navy developed bombers for interdiction missions. The Navy argued that it should be allowed to use atomic weapons -- tactically and strategically-- in pursuit of achieving the objectives of a naval campaign and in accordance with the functions of naval carriers.[11] Challenges to the USAF's aviation control were not exclusive to the Navy but also existed from the Army.

Organic Army Aviation

On June 6, 1942, the War Department established Organic Army Aviation based on recommendations within the Army Ground Forces (AGF).[12] As the autonomy of the AAF increased, the AAF increased its focus on strategic airpower and decreased its emphasis on ground support.[13] Army ground commanders demanded more support from the air arm. The concept of organic aviation—aviation assets embedded with ground forces and owned by the ground force commander—sought to fill the gap between ground commanders' needs and support from the air arm.[14] In January 1942, the Army Field Artillery School organized a flight-detachment designated as the Air Training Detachment to explore the possibilities of using light airplanes to improve fire adjustment for artillery units. Artillerymen were unhappy with the support provided by AAF and ran tests of aerial observation using light aircraft. The results of the tests proved that Army observation units performed better than AAF observation squadrons.[15] During the tests, Army artillery pilots brought fire on targets in an average of two minutes compared to 25 minutes from AAF pilots.[16] The performance of the artillery pilots emboldened the War Department and spurred the creation of Organic Army Aviation.

The AAF vehemently opposed Organic Aviation; LTG Hap Arnold argued that

[10] Truman, 9.
[11] Goldberg, *A History of the United States Air Force 1907-1957*, 116.
[12] James W Williams, *A History of Army Aviation: From Its Beginnings to the War on Terror* (New York: iUniverse, 2005), 36.
[13] Williams, 33.
[14] Williams, 33.
[15] Williams, 36.
[16] Williams, 36.

giving light aircraft to ground forces would create a separate Air Force within the Army.[17] The AAF believed in the centralization of air power under one commander. Despite arguments from the AAF, Assistant Secretary of War John McCloy overruled the AAF's complaints and thought that the benefits of aviation were too important to be confined within the AAF. McCloy also supported the increased production of light aircraft to support manufacturers and maintain the industrial base.[18] Organic Aviation coexisted with the AAF during WWII. Following the NSA of 1947, the role of Organic Aviation remained uncertain and the Key West agreements did little to resolve the existing uncertainty.

The Key West agreements barely addressed the division of roles and missions between the Air Force and Army. The agreement assigned the USAF a specific function "to furnish close combat and logistical air support to the Army, to include air lift, support, and resupply of airborne operations."[19] Regarding Organic Aviation, the agreement permitted the Army to maintain land combat and service forces and aviation as may be organic to those forces.[20] A 1949 amendment to the NSA of 1947 allowed the Army to retain aviation assets as part of ground combat units. [21] The term organic elements was open to interpretation, and as such, the Army maintained a small air fleet intended for use within the battle zone.[22] The Army's air fleet conflicted with the Air Force. The Army argued that it needed more air support to accomplish its ground missions and the Air Force argued that the Army was developing capabilities beyond those explicitly authorized. The tension between the Air Force and Army over roles and missions sparked several agreements between their respective Chiefs of Staff.

In May 1949, Generals Omar Bradley and Hoyt Vandenberg, respectively Chiefs of Staff of the Army and Air Force, agreed on limitations to Organic Aviation.[23] Bradley and Vandenberg's agreements limited fixed-wing aircraft to less than 2500 pounds and

[17] Williams, 37.
[18] Williams, 37.
[19] Truman, "Key West Agreement," 11.
[20] Williams, *A History of Army Aviation*, 50.
[21] Goldberg, *A History of the United States Air Force 1907-1957*, 118.
[22] Goldberg, 118.
[23] Williams, *A History of Army Aviation*, 51.

helicopters to less than 4000 pounds.[24] The Chiefs' limitations allowed the Army to maintain aircraft capable of performing tasks necessary to improve ground combat. The task permitted to Organic Aviation included route reconnaissance, fire adjustment, and courier services.[25] The Army's Organic Aviation served to supplement Air Force liaison units that performed the same functions. Joint Army and Air Force Adjustment Regulation 5-10-1 incorporated the Bradley-Vandenberg agreement into official policy.[26] Additionally, Regulation 5-10-1 permitted Organic Aviation to conduct aerial surveillance of enemy forward areas. Regulation 5-10-1 limited Organic Aviation to non-offensive aerial action. The duplication of functions by Organic Aviation and the Air Force and the prohibition against offensive action continued to feed the tension between ground commanders who demanded more tactical support from the Air Force. The respective secretaries of the Army and Air Force intervened to resolve a conflict that the service chiefs had failed to resolve.

On 2 October 1951, Secretary of the Air Force Thomas Finletter and Secretary of the Army Frank Pace agreed to replace the weight limits on Organic Aviation with functional definitions on the roles and missions of Organic Aviation. The Pace-Finletter Agreement of 1951 sought to eliminate duplication of effort and clarify ownership of roles and missions. However, it failed to distinguish between the responsibilities of the Army and the Air Force. The agreement limited Organic Aviation to within 70 miles of the front lines. The agreement prohibited certain missions but then emphasized immediate responsiveness and authorized ground commanders to use Organic Aviation as they deem necessary to accomplish their mission. Pace-Finletter prohibited Organic Aviation from conducting close combat support, troop carrier airlift, assault transport, reconnaissance, and interdiction.[27]

The charge to use Organic Aviation as necessary and the emphasis on responsiveness established a gray area regarding rapid battlefield transport. As the Korean War waged, ground commanders relied on the Air Force for troop transport and medical evacuation (MEDEVAC). Ground commanders lamented that lack of control

[24] Williams, 51.
[25] Williams, 51.
[26] Williams, 51.
[27] Williams, 53.

over these functions impeded their ability to accomplish their mission. The Army envied the span of control that the Navy and Marines had over their air assets. Army ground commanders wanted to expand the functions of Organic Aviation to increase battlefield responsiveness. Over time, much to the alarm of the USAF, the size and number of the Army aviation fleet increased. The increase in the size of army aviation stemmed from a desire for increased tactical control. During the Korean war, the Army increased the number of its liaison and aircraft and helicopters due to the increased mobility available to ground commanders.[28] Pace and Finletter had to intervene again to mediate conflict.

On 4 November 1952, Pace and Finletter signed a second agreement to balance the desires of ground commanders and the Air Force. The Pace-Finletter memorandum re-imposed a 5,000-pound weight restriction on all Army aircraft except helicopters and defined the meaning of Organic Aviation.[29] According to the agreement, Organic Aviation consisted of aircraft used for expediting and improving ground combat and logistic procedures but did not duplicate USAF functions.[30] The 1952 agreement expanded the range of organic aviation to within 100-miles of the front lines and assigned MEDEVAC as an authorized mission.[31] Pace pacified the Air Force by reintroducing weight limits on Organic Aviation, and Finletter sought to allay the Army's concerns by expanding its area of operations. The Pace-Finletter negotiations settled on the 5,000-pound weight limitation as the heaviest Army aircraft at the time was 4,000 pounds. The hope was that the buffer within the agreement would give the Army room to expand without encroaching on the USAF's domain. The Army still clamored for larger fixed-wing aircraft as Army spokesmen felt that the USAF was not providing enough tactical support.

Disputes over the importance of tactical air support between the Army and Air Force necessitated the involvement of the Secretary of Defense. The Army argued that the Air Force was not doing enough to support tactical aviation. Furthermore, Army leaders believed that the Air Force could not provide enough air transportation to support mobile atomic forces. The belief of Army commanders stemmed from the Air Force's

[28] Goldberg, *A History of the United States Air Force 1907-1957*, 118.
[29] Goldberg, 118.
[30] Goldberg, 118.
[31] Goldberg, 53.

prioritization of other missions over troop transport. Budget constraints and SAC prioritization required the Air Force to readjust its force allocation. In 1953, the Air Force reduced its planned troop carrier wings from 17 to 11. In response, the Army expanded the fleet size and responsibilities of Organic Aviation. As the tension continued to ratchet up, Secretary of Defense Charles Wilson intervened in 1957. Wilson issued a memorandum that superseded but re-affirmed most of the Pace-Finletter provisions.

The Wilson memorandum retained the 5,000-pound limitation on fixed-wing aircraft and imposed a 20,000-pound limit on helicopters.[32] The Air Force retained responsibility for strategic and tactical airlift, tactical reconnaissance, battlefield interdiction, and close combat support.[33] Organic Aviation could conduct airlift of Army personnel and materiel within 100 miles of the front lines, aeromedical evacuation, fire-adjustment, and reconnaissance. The difference between the responsibilities of the Air Force and Organic Aviation resided in the tactical use of the air domain. Organic aviation could transit the air domain to support and augment ground commanders. The Air Force was responsible for using the air domain to directly pursue objectives that could only be pursued from the air domain. The nebulous distinction between the Air Force responsibilities of tactical reconnaissance and tactical airlift and Organic Aviation's role of reconnaissance and battlefield airlift continued to create tension between the services. The ubiquitous nature of the air domain negated the ability to draw clear lines of responsibility despite attempts by the Chiefs of Staff and the Secretary of Defense.

Organization

Organic Aviation did not duplicate the organizational structure of the AAF. Organic Aviation implemented an organizational structure that best met the needs of ground commanders. The War Department's directive to create Organic Aviation embedded two aircraft, two pilots, and one mechanic in each medium and light field artillery battalion, division artillery headquarters, headquarters battery, and field artillery brigade headquarters.[34] This force structure endured until the Korean War. The increased demand for air support during the Korean War resulted in establishing divisional aviation companies. As a result, the number of aircraft assigned to Army divisions swelled from

[32] Goldberg, 118.
[33] Goldberg, 118.
[34] Williams, *A History of Army Aviation*, 37.

10 to 18.[35]

In 1942, the War Department also established a Department of Air Training at the Field Artillery School. The AAF accomplished primary training for pilots, and the AGF was responsible for operational training for mechanics, observers, and pilots.[36] The AGF initially recruited enlisted pilots as observation aircraft pilots. Increased use of light attack aircraft showed that experienced officer pilots and qualified artillery officers were more effective as observation pilots than enlisted pilots.[37] In 1953, the Department of the Army replaced the Department of Air Training with an Aviation School at Fort Rucker, Alabama. In 1955, Fort Rucker became the US Army aviation center, equivalent to other combat arms centers. Fort Rucker rapidly expanded to become the center of Organic Aviation, taking on primary training for Army aviators and service test boards.[38] Establishing and growing Fort Rucker gave Organic Aviation a place to develop its own doctrine and culture separate from the Air Force.

The success of Organic Aviation required representation beyond the War Department. Initially, the War Department placed an artillery officer on higher staff in the Pentagon to coordinate aviation-related actions. The AAF was responsible for the supply, repairs, and primary flight training, but AGF was responsible for supply, repairs, and operational training. The Organic Aviation representative at the Pentagon worked with the AAF to provide support for deployed aircraft, maintenance, and supply needs. Since the Army still relied on the Air Force for aircraft procurement, Organic Aviation representation increased within the Pentagon as interservice coordination became more important

Technology

The technological focus of Organic Aviation resided in light fixed-wing aircraft and helicopters. Per the NSA of 1947, the Air Force was responsible for procuring aircraft for the Army. Relying on the Air Force for procurement limited the growth of Organic Aviation. The Air Force did not see much utility in helicopters. James Williams writes that, in 1948, the Air Force director of requirements refused to obtain helicopters

[35] Williams, 56.
[36] Williams, 37.
[37] Williams, 37.
[38] Williams, 66–67.

when requested by the Army Airborne Panel.[39] Procurement limitations forced the Army to experiment with existing technology to improve the efficiency of Organic Aviation. Army Captain Glenn Goodhand developed night flying techniques for adjusting long-range artillery fire and techniques for light aircraft to direct fighter-bomber attacks beyond the range of artillery.[40] The Army also experimented with using helicopters as Sky Cavalry. The original stated purpose of Army helicopters was for transport and MEDEVAC. Army officers sought to expand the role of helicopters within the Army by placing 105mm howitzer guns on helicopters.[41] The expansion of Sky Cavalry able to use armed helicopters in support of ground troops clashed with the Air Force's role as providers of combat airpower. In 1957, the Secretary of Defense ordered the Army to cease armament experiments.

Physical Environment

The physical environment for Organic Aviation resided within that of the Air Force. Organic Aviation transited through the air domain to provide support to ground commanders. The Pace-Finletter and Wilson memorandums tied Organic Aviation to the front lines. The 100-mile limit and mission responsibilities limited Organic Aviation to low-altitude and slow speed use of the air domain.

Culture

The culture of Organic Aviation evolved quickly between its birth in 1942 and the establishment of the Air Force in 1947. One of the observable artifacts of Organic Aviation was its integration into units at all levels of the Army. Unlike the centralized control demanded by the AAF and eventually the Air Force, Organic Aviation believed in dedicating aircraft to ground units. Another artifact of Organic Aviation was helicopters. Unlike the Army, the Air Force did not see the utility in helicopters. Organic Aviation sought to explore the limits of the use of helicopters. The artifacts of Organic Aviation supported the espoused belief that aviation should provide support for ground commanders under the control of ground commanders.

The Army believed that it could provide better observation and reconnaissance than the AAF. The initial emphasis in Organic Aviation was on observation and artillery

[39] Williams, 54–55.
[40] Williams, 41.
[41] Williams, 77.

support. Observation pilots developed doctrine on the fly by exploring techniques to improve artillery observation. Some of the best practices codified as standard operating procedures differed from those taught at the artillery school at Fort Sill.[42] Army liaison pilots' flexibility also clashed with the AAF. Observation pilots often exceeded approved responsibilities to meet the ground commander's intent. For example, Army liaison pilots started flying night missions to improve nighttime artillery observation. General Hap Arnold complained that night flying exceeded the intent of Organic Aviation.[43] The success of Organic Aviation resulted in more demand by ground commanders which drove the expansion of Organic Aviation. Additionally, the strategic focus of the AAF equated to a decrease in focus in tactical aviation. The growth of Organic Aviation echoed an evolution in its espoused beliefs; Army commanders believed that the Army should develop its own transport and aerial combat units.[44] In 1956, Army General Taylor advocated for expanding Organic Aviation into air superiority and inter-theatre airlift.[45] The Army operated with the underlying assumption that mission success required tactical air support, and the Army believed the Air Force was not doing enough to support tactical aviation. The lack of responsiveness in Air Force battlefield response could be overcome by giving more responsibility to Organic Aviation. The tension between the Air Force and Organic Aviation shaped the external image of Organic Aviation.

The Air Force viewed Organic Aviation chiefly as an unnecessary duplication of effort. Organic Aviation encroached on Air Force responsibilities and diverted funds from the Air Force. Civilians, such as the Secretary of Defense, intervened to negotiate a compromise. Organic Aviation strove to express its cultural understandings and convince others as to its importance. Outside of the Air Force, others recognized the need for Organic Aviation and agreed that the Air Force should retain its strategic focus and leave organic elements of the aviation to the Army. The Key West Agreements, Pace-Finletter Agreements, and Wilson Memorandums all sought to balance the responsibilities of the two entities while minimizing duplication. The resulting identity of Organic Aviation was that of a necessary, responsive non-combat unit directly under the control of ground

[42] Williams, 40.
[43] Williams, 42–43.
[44] Williams, 78.
[45] Williams, 78.

commanders. Organic Aviation enhanced battlefield effectiveness. Army pilots innovated as necessary to meet the needs of ground commanders. Organic Aviation enabled the Army to preserve its core identity as predominantly self-reliant in ground operations.

Conclusion

Airpower was a force multiplier for ground and naval combat, and the Army and Navy did not want to relinquish control of their air assets to the Air Force. Both the Army and Navy believed that they should retain control of aviation assets that fell under respective local commanders. Also, both services recognized the importance of aviation to securing budgetary resources. The rising cost of technology meant that airpower assets secured a larger portion of the budget.[46] The differences between the Army and Navy cases resided in their jurisdictional claim. From the advent of airpower, Army and Navy aviation developed independently from each other. Both services pursued various aviation capabilities to increase their prowess in battle. Naval aviation developed in tandem with naval vessels and was tied to carriers.[47] Naval aviators trained to all aspects of naval functions, from administrative work to ship command, not just aviation-specific functions.[48] The embedded nature of naval aviation to regular naval operations prevented the separation of naval aviation in 1947.

In contrast, as discussed in chapter 3, Army aviation developed towards an independent air force. The air component grew from working in tandem with the ground-centric Army to working separately from those core land components. AAF aviators and their predecessors trained in aviation tactics and not ground combat tactics. When the Air Force lobbied for centralized control, the Navy argued instead that dispersed control of aviation assets to fleet commanders made more sense for naval aviation.[49] One of the reasons the Navy retained naval aviation was because giving control of naval aviation to the Air Force would result in jurisdictional issues in areas beyond aviation. Separating naval aviation from the Navy would affect the Navy's ability to define, theorize, and

---

[46] Goldberg, *A History of the United States Air Force 1907-1957*, 117.
[47] Herman S. Wolk, *The Struggle for Air Force Independence, 1943-1947*, Rev. ed. (Washington, D.C: Air Force History and Museums Program, 1997), 165.
[48] Paul R. Schartz, *Evolution of the American Military Establishment Since World War II* (Lexington, VA.: George C. Marshall Research Foundation, 1978), 1.
[49] Wolk, *The Struggle for Air Force Independence, 1943-1947*, 166.

implement in naval areas where it had formal jurisdiction. Since the AAF that became the Air Force never had jurisdiction in naval aviation, the NSA of 1947 and the Key West Agreement built upon existing jurisdictional divisions.

The Army's competition with the Air Force concerned the importance and control of battlefield aviation: armed reconnaissance, close air support, and battlefield interdiction. The Army did not want to contend with the Air Force in providing strategic airpower. The Navy, on the other hand, sought to contend with the Air Force in the strategic realm. The Navy viewed the Air Force's long-range bombers as a challenge to the strategic claim of the carrier fleet. The Navy argued that it could provide strategic capability if given a chance, but the Air Force was siphoning off resources. For example, the Navy argued that the Air Force inflated the capability of the B-36 and drained much-needed resources.[50]

The jurisdictional conflicts between the Air Force and the other services provides broad lessons that may apply to the Space Force. As mentioned in Chapter 2, jurisdictional claims can be formal or informal. If services are granted formal jurisdiction, previous structures of informal jurisdiction persist particularly within a service's culture. Apportioning formal jurisdictional rights to one service does not prevent competition, especially when the missions assigned to the different services are so similar. Similarities in missions blur the boundaries between jurisdictional claims and provide plausible deniability when a service strays beyond its formal authorization. Interservice competition over aviation roles and missions persisted despite multiple attempts from civilian leaders to intervene.

The Air Force lobbied for formal jurisdiction of the strategic air mission and combat air operations over land. However, budget constraints meant that the Air Force had to prioritize which roles and missions received the most attention. Prosecuting and defending against strategic air threats was the most critical mission. Prioritizing the strategic mission, mostly residing in SAC, made sense. Strategic warfare was a mission that the Air Force alone could do and failure had significant consequences. A gain for strategic missions meant a loss for tactical missions directly supporting ground commanders. Although the Air Force still performed these missions, it was not to the

[50] Goldberg, *A History of the United States Air Force 1907-1957*, 116.

satisfaction of ground commanders, hence the reliance on Organic Aviation. Organic aviation filled the gaps in capability generated by the Air Force strategic focus. Additionally, Organic Aviation gave Army commanders direct control of embedded units as opposed to the centralized control of Air Force assets.

While fighting for its independence, the Air Force took the pure theory of airpower to an ideological extreme by lobbying for centralized control of all air assets besides organic assets.[51] Airplanes are different from conventional ground weapons in that giving each unit an airplane is inefficient. The Air Force believed that centralized control and decentralized execution was a better way to allocate and use limited resources.[52] The Air Force focused on achieving air objectives, which did not always consider ground commanders. The Army argued that a centralized approach was top-down focused and did not adequately benefit ground commanders.[53] The Army believed the Air Force had a blind spot for the tactical combined-arms aspect of airpower.[54] The Army was concerned with missions from the air and believed that decentralized control and execution was the best means to support ground commanders.[55] The ensuing combined approach of Air Force strategic focus and Army Organic Aviation was a good solution. Although it created jurisdictional tension and grey areas, having both entities best met the needs of the Army and Air Force.

The positions of both services make sense as both services pursued appropriate means to achieve their professional purpose. On balance, Army Organic Aviation was a net positive for national security, as it provided a way to meet the airpower needs of the Army while freeing the Air Force to focus on strategic missions. The cross-domain applicability of airpower meant that it could not remain confined to one service. The Navy retained naval aviation. It made sense that the Army would have Organic Aviation; its mission was not the same as that of the Air Force. The tension between Organic Aviation and the Air Force arose when Organic Aviation encroached into armed operations and started duplicating Air Force capability. The existence of Organic Aviation and the tension with the Air Force provides lessons for the Air Force in its

[51] Wolk, *The Struggle for Air Force Independence, 1943-1947*, 166.
[52] Goldberg, *A History of the United States Air Force 1907-1957*, 118.
[53] Goldberg, 118.
[54] Williams, *A History of Army Aviation*, 33.
[55] Williams, 42.

future dealings with the Space Force. Organic Aviation grew out of a need for the Army to retain ground combat lethality when the Air Force did not meet the Army's needs. The Army established an aviation organization, developed associated technology, and claimed a physical environment to support its jurisdictional claim of Organic Aviation. Organic Aviation has since become Army Aviation, a staple of Army operations. Does today's environment necessitate the Air Force to prepare to grow its own organic space capabilities following a similar path of the Army?

Chapter 5

Operating Above the Air

Changes in military systems come about only through the pressure of public opinion or disaster in war.

Colonel William 'Billy' Mitchell

The jurisdictional struggles of the Army in the 1950s are both like and unlike the struggles currently facing the Air Force in relation to space domain. They are similar in that both the Army and Air Force ceded formal jurisdictional control of certain functions within a ubiquitous domain to a new service, while still relying on capabilities in that domain to be successful. The Army's response in the 1950s was to grow organic aviation capabilities. Should that be the Air Force's response today?

Two key differences prevent direct comparison between the Army's aviation challenge and the Air Force's space challenge. The first is the renewed operationally joint environment spurred by the Goldwater-Nichols Department of Defense Reorganization Act of 1986,[1] and the second involves the unique characteristics of the space domain. Both differences carry significant weight above Air Force desires to create an organic space organization and suggest that the Air Force of today should not directly emulate the actions of the Army in the 1950s. The changes in the Department of Defense (DoD) resulting from the Goldwater-Nichols Act means that what worked for the Army may not work for the Air Force. This chapter explores the significance of the Goldwater-Nichols Act and compares the nature of the air domain to the space domain.

Goldwater-Nichols Department of Defense Reorganization Act of 1986

Considered "the watershed event for the military since [World War II]," the Goldwater-Nichols Act was the broadest reorganization of the Department of Defense since its establishment by the NSA of 1947.[2] The Honorable James Locher writes that the Goldwater-Nichols Act strengthened civilian authority over the military, improved military advice provided to civilian leadership, and of primary concern to this thesis,

[1] Will be referred to as the Goldwater-Nichols Act for brevity sake

[2] James R. Locher III, "Taking Stock of Goldwater-Nichols," *JFQ: Joint Force Quarterly* Autumn, no. 34 (1996): 16. The quote belongs to former Vice CJCS Admiral William Owens.

elucidated the responsibility and authority of combatant commanders while enhancing the efficiency and effectiveness of military operations.[3] Archie Barrett writes that the reorganization envisioned by the Goldwater-Nichols act was very similar to already enacted amendments to the NSA of 1947 undertaken in 1949,1953, and 1958.[4] Under the post-1958 organizational model, service chiefs were responsible to organize, train, equip (OT&E) forces in preparation for war, and joint combatant commanders were responsible for employing forces to win the nation's wars.[5] The real success in the Goldwater-Nichols Act resided in weakening the authority of service chiefs while strengthening the authority of combatant commanders and the Chairman of the Joint Chiefs of Staff (CJCS).

Despite the de jure organization model mandated by amendments to the NSA of 1947, the de facto reality was that service chiefs dominated the DoD. Service chiefs unofficially retained responsibility for planning, preparing, and employing forces and entrenched parochial traditions made the services unwilling to relinquish operational warfighting control to joint commanders.[6] The Goldwater-Nichols act sought to unify de jure and de facto organization models by strengthening the authority of joint entities such as the CJCS and combatant commanders. The Goldwater-Nichols act transferred the responsibility of principal military adviser from the Joint Chiefs collectively to the CJCS personally.[7] To remove undue influence of service chiefs on combatant commanders, Congress removed the CJCS and Joint Chiefs from the chain of command of combatant commanders; the new chain of command ran from the President to the Secretary of Defense and then to combatant commanders.[8] The result was a more efficient and effective fighting force that prioritized joint employment and success over interservice rivalry. According to historian Ronald Cole, the DoD had long recognized the need for joint operational reform following challenges in Vietnam, the failed Iranian hostage rescue in Operation Eagle Claw (1980), and Operation Urgent Fury in Grenada (1983).[9]

---

[3] Locher III, 10–11.
[4] Locher III, 13.
[5] Locher III, 13.
[6] Locher III, 13.
[7] Locher III, 12.
[8] Locher III, 13.
[9] Ronald H. Cole, "Grenada, Panama, and Haiti: Joint Operational Reform," *JFQ: Joint Force Quarterly* Autumn/Winter (99 1998): 57.

The subsequent successes of Operation Just Cause in Panama and Operation Desert Storm in the Persian Gulf illustrated impactful and beneficial changes of the Goldwater-Nichols Act.[10]

Under Goldwater-Nichols, services in the DoD no longer go to war as a "weak confederation of sovereign military units."[11] Combatant commanders exercise full operational control over all assigned air, land, and sea assets and personnel without requiring approval from service chiefs. Goldwater-Nichols changed the character of jurisdictional disputes between services. When applied to the growth of organic aviation, ground commanders clamoring for more air support would have taken their complaints to the combatant commander and not the Air Force as a service. Organic Army aviation grew because ground commanders believed that Air Force decision-makers did not correctly prioritize tactical aviation. Under Goldwater-Nichols, the Air Force does not get to make that decision during combat operations. Goldwater-Nichols increases joint-effectiveness by shifting the decision-making authority of airpower allocation from service chiefs to joint commanders. Combatant commanders allocate Air Force assets to perform tactical missions as needed in support of the war effort. By focusing on overall joint capability, Goldwater-Nichols seeks to reduce redundant capabilities.

Goldwater-Nichols increased the effectiveness of wartime operations with the intent of eliminating peacetime redundancies. Services bear the responsibilities of organizing, training, and equipping their personnel in peacetime in preparation for wartime operations. As such, a service chief and service secretary decide what capabilities the service develops. However, the empowered position of the secretary of defense (SECDEF) makes the final decision for the DoD on budget allocations.[12] In an ideal scenario, individual services justify their budget requests to the SECDEF; the SECDEF holistically considers the entire requested capabilities of the DoD when approving budgets to reduce redundant capabilities across services. When considering required and desired capabilities, the SECDEF also considers the requests of combatant commanders. If services are not providing adequate forces and capabilities to combatant

[10] Cole, 64.
[11] Locher III, "Taking Stock of Goldwater-Nichols," 13. The quote belongs to President Eisenhower.
[12] 99th Congress, "Public Law 99-433 Goldwater-Nichols Department of Defense Reorganization Act of 1986," October 1, 1986, https://history.defense.gov/Portals/70/Documents/dod_reforms/Goldwater-NicholsDoDReordAct1986.pdf.

commanders, the SECDEF in turn pressures service secretaries and chiefs to adjust as required.

Casting forward and applying Goldwater-Nichols to the space domain, a strong joint warfighting culture in DoD changes the ways in which combatant commands and services relate to one another. Operations in and through space involve not only the services, but more importantly, empowered combatant commands. Combatant commanders will be responsible for using space assets in support of the war effort. As such, in the present era of improved joint operations and reduced redundancies, does the Air Force need to develop organic space capabilities in support of Air Force objectives? Or should the Air Force be content to let the Space Force bear the burden for meeting the needs of the combatant commander? Before answering these questions, one must delve into the nature of the space operations and how that nature affects warfighting.

The Unique Nature of Space

The launch of Sputnik I on October 4, 1957 ushered in the space age. Since Sputnik, space has become increasingly congested with over 2,200 satellites in orbit as of December 2019.[13] Space is a unique domain in that it resides outside the earth; its defining characteristics stems from its extraterrestrial location. The space domain begins at the upper reaches of the earth's atmosphere with no physical end point besides technology-imposed limitations.[14] To access the space domain, spacecraft[15] launched from the earth must achieve escape velocity to transit through the earth's atmosphere before establishing an orbit. Figure 7 depicts the four common terrestrial orbits: geosynchronous earth orbit (GEO), highly elliptical orbit (HEO), medium earth orbit (MEO), and low earth orbit (LEO). Launching a spacecraft into orbit requires significant investment. Developing, launching, and maintain spacecrafts in orbits requires a

[13] "Satellite Database | Union of Concerned Scientists," Union of Concerned Scientists, December 16, 2019, https://www.ucsusa.org/resources/satellite-database.
[14] Kenny Grosselin et al., "Space Capstone Publication - A: Spacepower (v2.0)," February 2020, 4. Although compiled by military space professionals, SCP-A is not officially sanctioned doctrine and does not reflect the views of the Space Force.
[15] "While any object in orbit is generically referred to as a satellite, the term spacecraft refers to an object that is controlled and deliberately employed in order to perform a useful purpose while traveling to, through, or from the space domain" from Kenny Grosselin et al., "Space Capstone Publication - A: Spacepower (v2.0)," February 2020, 3.

substantial commitment in finances, resources, and time.[16] Although the growth of commercial companies providing space-based services has lowered reduced the financial costs to access the space domain, the physics of the space make operations within the domain a challenge.[17]

Figure 7: Terrestrial Satellite Orbits
Source: Vasco Sequeira et al., "Improving HF Communications Efficiency Using Evolved Data Rate Change Algorithms," Revista de Ciências Militares VI (November 1, 2018): 241.

The physics of operating in space differ greatly from operating within the earth's atmosphere. Due to the earth's gravity, satellites orbiting the earth move in an elliptical orbit as described by Johannes Kepler's laws of planetary motion.[18] According to Kepler's second law, depicted in Figure 8, a satellite will cover equal areas in equal intervals of time as it orbits the earth. This means that a satellite's speed at its apogee—point furthest away from the earth—is slower that at its perigee when closest to the earth. Efficient satellite operations must account for a satellite's elliptical orbit.

[16] Joshua Hampson, "The Future of Space Commercialization" (Niskanen Center, January 25, 2017), 4–5.
[17] NASIC Public Affairs Office, "Competing in Space," 2.
[18] Kel Elkins, "SVS: Kepler's Laws of Planetary Motion Described Using Earth Satellites," NASA Scientific Visualization Studio, accessed April 16, 2020, https://svs.gsfc.nasa.gov/4642.

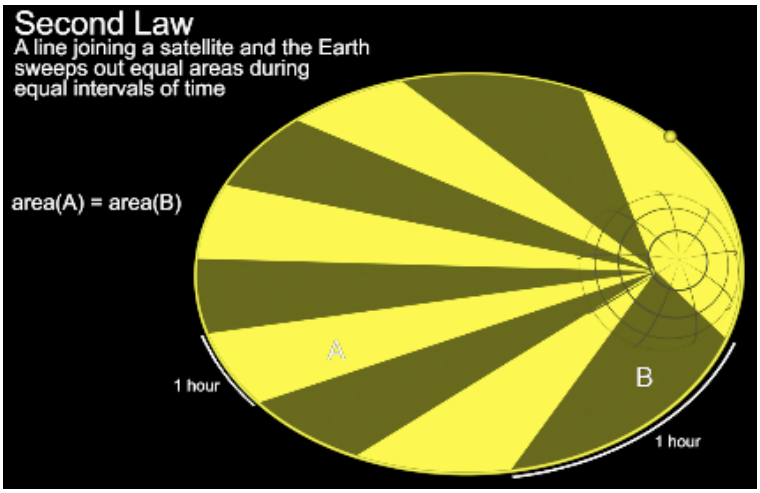

Figure 8: Kepler's Second Law of Planetary Motion
Source: Kel Elkins, "SVS: Kepler's Laws of Planetary Motion Described Using Earth Satellites," NASA Scientific Visualization Studio, accessed April 16, 2020, https://svs.gsfc.nasa.gov/4642.

A satellite's launch must account for its intended orbit and place the apogee and perigee appropriately to maximize sensor coverage over a desired region. Once established in orbit, satellites need to use propellant to maintain or change orbits. Satellites reside in the space domain for their entire operational cycle. When spacecraft can no longer maintain desired orbits, they fall into lower orbits, eventually plummeting to oblivion in the earth's atmosphere.[19] Space operators use precious on-board propellant to maneuver satellites to maintain orbits, provide on-demand coverage, and avoid collisions.[20] More fuel on board means a heavier satellite, and therefore, a more expensive satellite. As of 2017, space launches cost between $27,000 and $43,000 per pound.[21] Maintaining a spacecraft's desired orbit requires constant vigilance from ground-based space operators.

The physical location of space means that space operators are not collocated with the assets they control. Unlike traditional aircraft where pilots are physically located in the cockpit, the closest satellites in LEO begin at over 100 kilometers above the earth's

[19] Brian D. Green, "Space Situational Awareness Data Sharing: Safety Tool or Security Threat," *Air Force Law Review* 75 (2016): 56–57.
[20] Elbridge Colby, *From Sanctuary to Battlefield: A Framework for a U.S. Defense and Deterrence Strategy for Space*, 2016, 11.
[21] Hampson, "The Future of Space Commercialization," 4.

surface.[22] Whereas remotely piloted aircraft are the exception in the air domain, remote operations are the norm in space. Not being physically present in the domain increases the reliance of space operators on off- and on-board spacecraft sensors to maintain safe and effective operations. Space is a congested environment, and space operators rely on information compiled from various sources to maintain space situational awareness and ensure deconfliction from other spacecraft and space debris.[23] Efficient space operations depend on the ability to transmit information within the electro-magnetic between spacecraft and operator.[24] While the beyond-terrestrial location of the space domain has high entry and maintenance costs, the resultant benefits from operations in the domain justify the expense.

The air and space domains are ubiquitous domains, but space is even more ubiquitous. Assets in air and space support operation in other domains, but the beyond-terrestrial nature of space assets result in a wider field of view than air assets can provide. In the US, all the military services rely on space assets for functions such as communication, navigation, and intelligence, surveillance, and recognition (ISR).[25] The global perspective of space assets results in strategic compression, eroding the classification of satellites as tactical, operational, or strategic.[26] A single spacecraft can fulfill tactical, operational, and strategic roles for numerous organizations.[27] The same satellite that ensures successful communication between global strike assets may simultaneously support communication between ground controllers and close-air support aircraft.

One key implication of strategic compression is that a more useful way of thinking about space assets is about control and not ownership. Strategic compression, costs to field and replace, and combined strategic value combine to make spacecraft national assets and not service-specific assets.[28] Space assets fulfill national objectives

[22] Green, "Space Situational Awareness Data Sharing," 49.
[23] Green, 56.
[24] Grosselin et al., "Space Capstone Publication - A: Spacepower (v2.0)," 20.
[25] NASIC Public Affairs Office, "Competing in Space," 6.
[26] Grosselin et al., "Space Capstone Publication - A: Spacepower (v2.0)," 57.
[27] Grosselin et al., 57.
[28] Grosselin et al., 57.

across interdependent organizations beyond just the military.[29] Numerous government agencies, such as NASA, rely on commercial companies for both access to and operations in space.[30] While satellite ownership has regulatory considerations, operations are more concerned with capability. The lack of national borders and overflight restrictions in space means that any spacecraft-commercial or government—with the required sensor capability is an important information source.[31]

Conclusion

The Goldwater-Nichols Act sought to prevent the development of redundant capabilities amongst the services. The legislation sought to align DoD priorities in support of joint operations under the leadership of an empowered combatant commander and SECDEF. In principle, services would no longer develop capabilities based on parochial priorities but rather in support of providing necessary forces to combatant commanders. In reality, parochial concerns and redundant capabilities still exist within services. Military services justify these capabilities as crucial to the success of forces presented to joint commanders. Are they any such space capabilities for the Air Force?

The unique nature of space plays a large role in determining if such capabilities exist for any service besides the jurisdictionally sanctioned Space Force. Spacecraft require considerable resources to develop, deploy, and maintain. These resource barriers make it difficult to develop service-specific spacecraft. Strategic compression and the simultaneous reliance of numerous services prevent any service from owning full rights to spacecraft. Spacecraft are national assets intended for use in support of joint operations. Physically, the Space Force operates above the Air Force, and legally Goldwater-Nichols Act placed the prioritization of joint needs over service specific needs. Combining the nature of the space domain with the intent of the Goldwater-Nichols Act, one must ask, should the Air Force pursue organic space capabilities similar to how the Army pursued organic aviation?

---

[29] Grosselin et al., 58.
[30] Matthew Weinzierl, "Space, the Final Economic Frontier," *The Journal of Economic Perspectives* 32, no. 2 (2018): 182–83.
[31] Grosselin et al., "Space Capstone Publication - A: Spacepower (v2.0)," 24.

Chapter 6

Recommendations and Conclusion

> *As necessary, DoD Components may retain organic space capabilities uniquely required to support the core mission of that Military Service or Defense Agency.*
>
> *United States Space Force Strategic Overview*

We have constructed our historical bridge by looking back at the birth of the Air Force and the subsequent attempts to divide the air domain between the Army, Navy, and Air Force. Our historical bridge spans from the birth of the Air Service in 1907 to the Wilson Memorandum in 1957. At the end of our bridge, we have three services vying for jurisdictional control in the air domain. Creating an independent strategic-minded Air Force affected the roles and missions of the other two services. The creation of the Space Force is likewise forcing change upon the Air Force.

For better or for worse, the USAF is no longer in the business of space warfighting. This period of change provides an opportunity for the Air Force to reconstruct its identity and draw inspiration from its historical bridge. The case of the Air Force and the Army in 1947 illustrates the importance of settling compatible jurisdictions between services within a ubiquitous domain. A separate Space Force may not mean the end of the Air Force operating in, from, and through space; the Army retained aviation roles and missions despite the presence of an independent Air Force. However, a separate Space Force does change the jurisdictional purview of the Air Force in the space domain. The chapter will now filter applicable lessons learned from organic Army aviation through the two differences highlighted in chapter 5 to provide recommendations for the Air Force using our four analytical lenses. The recommendations in culture delve into reconstructing a new Air Force identity.

Organization

The Air Force relies on space to provide satellite-based weather, intelligence,

navigation, and communications.[1] Air Force Space Command (AFSPC) became the US Space Force because of the strategic importance of space as a warfighting domain.[2] Establishing the new service enables the full exploitation of space capabilities to defend US interests. The recency of separation of the Space Force from the Air Force means that the people in the Space Force are still performing the same missions they did when in the Air Force. Unlike the Army, which established Organic Aviation in 1942 to satisfy the unfilled needs of ground commanders, to date, the Air Force has not created a separate organization outside of AFSPC to meet the needs of air commanders. The concern for the Air Force is what happens if the missions of the Space Force grow to exclude the concerns of air commanders.

As mentioned in chapters 3 and 4, the Air Force believed that strategic airpower provided the best means to defend the nation from emerging threats. Historian James Williams asserts that, as the Air Force evolved from the Air Corps to the AAF and then the Air Force, it prioritized strategic airpower over tactical airpower.[3] The shift in focus did not eliminate the need for tactical airpower; the Army still demanded tactical air support for its mission success. The AAF's focus on strategic capabilities created a void in tactical aviation that the Army filled with Organic Aviation. Once established, Organic Aviation expanded in size as the Air Force ventured deeper into exploiting the air for strategic missions.

Currently, there is no agreed upon general theory of spacepower.[4] The Space Force does not seek to pursue a different path than it was placed on by the Air Force, but rather seeks to expand that path in support of combatant commanders and national objectives.[5] US Space Command (USSPACECOM), reestablished in August 2019, is a

[1] "AFSPC History," Air Force Space Command, accessed March 25, 2020, https://www.afspc.af.mil/About-Us/AFSPC-History/.
[2] Aubrey SrA Milks, "Vandenberg All Call Addresses Future of Space," United States Space Force, February 28, 2020, https://www.spaceforce.mil/News/Article/2101374/vandenberg-all-call-addresses-future-of-space.
[3] James W Williams, *A History of Army Aviation: From Its Beginnings to the War on Terror* (New York: iUniverse, 2005), 51, 71.
[4] Michael Martindale and David Deptula, "Organizing Spacepower: Conditions for Creating a US Space Force," *Mitchell Institute Policy Paper* 16 (August 2018): 3.
[5] "U.S. Space Force Fact Sheet," United States Space Force, accessed March 23, 2020, https://www.spaceforce.mil/About-Us/Fact-Sheet.

unified combatant command responsible for all military operations in space.[6] In accordance with the Goldwater-Nichols act, USSPACECOM employs assigned forces from each of the military services, and the Space Force is one of those military services that has the responsibility to organize, train, and equip ready space forces. As of April 2020, the Chief of Space Operations for the Space Force also serves as Commander of USSPACECOM. The intertwined relationship of USSPACECOM and the Space Force raises organizational questions for the Air Force.

Of the 11 combatant commands, USSPACECOM is the only unified command whose preponderance of forces may come from only one service. Prior to the creation of the Space Force, USSPACECOM consisted of components from the Army, Navy, and Air Force. The Air Force representation was through AFSPC. The Army provides forces via US Army Space and Missile Defense Command (USAMDC).[7] The Navy's representation resides in US TENTH Fleet or Fleet Cyber Command, specifically a subcomponent called Naval Satellite Operations Center (NAVSOC) nested in Naval Network Warfare Command (NETWARCOM). With the creation of the Space Force, the Air Force has no representation in USSPACECOM, and the Space Force has long-term plans to absorb Army and Navy space missions.

According to the "Comprehensive Plan for the Organizational Structure of the U.S. Space Force" released by the Department of the Air Force in February 2020, the Space Force plans to incorporate personnel and missions from the Army and Navy in FY 2022.[8] The guiding intent and directive for the Space Force has always been to become the single military repository for space forces. Space Policy Directive-4 (SPD-4) released on February 19, 2019, envisions a Space Force that consolidates "existing forces and authorities for military space activities, as appropriate in order to minimize duplication of effort and eliminate bureaucratic inefficiencies," and should include "the uniformed and civilian personnel conducting and directly supporting space operations from all

[6] "United States Space Command Fact Sheet," United States Space Command, accessed April 13, 2020, http://www.spacecom.mil/About/Fact-Sheets-Editor/Article/1948216/united-states-space-command-fact-sheet/. Space Command was previously established in 1985. In 2002 it merged with US Strategic Command.

[7] "U.S. Army Space & Missile Defense Command - About Us," accessed April 13, 2020, https://www.smdc.army.mil/ABOUT/.

[8] Department of the Air Force, "Comprehensive Plan for the Organizational Structure of the U.S. Space Force," February 2020, 12, https://velosteam.com/wp-content/uploads/2020/02/Space-Force-Report.pdf.

Department of Defense Armed Forces."[9] The "United States Space Force Strategic Overview" released in February 2019 is in alignment and advocates for "consolidating the preponderance of existing military space missions, forces, and authorities under the Space Force."[10] The SECDEF also affirmed the consolidated purpose of the Space Force after the enactment of the FY 2020 National Defense Authorization Act (NDAA).[11] The envisioned end result is a future Space Force with the responsibility of OT&E of space forces for all military branches.[12]

Despite the vision to absorb the preponderance of military space functions, the Space Force does not envision USSPACECOM transitioning to a specified command[13] but rather expects all military services to continue providing forces to USSPACECOM.[14] This would be a significant departure from the Goldwater-Service Act as it would require all services to relinquish OT&E responsibilities of their provided forces to the Space Force.[15] The Army, Navy, Air Force, and Marine Corps will have to coordinate their requirements through the Space Force and not through the Commander USSPACECOM. In essence, the Space Force will largely shape the direction of USSPACECOM. The relationship between the Space Force and USSPACECOM challenges the intent of the Goldwater-Nichols Act regarding insulating combatant commanders from the undue influence of service chiefs. The Space Force plans to mitigate the concern of undue influence by pursuing seamless integration with sister services to ensure Space Force requirements reflect joint priorities.[16]

However, as the Space Force grows, budget concerns may impose limits on its

[9] "Text of Space Policy Directive-4: Establishment of the United States Space Force," The White House, February 19, 2019, https://www.whitehouse.gov/presidential-actions/text-space-policy-directive-4-establishment-united-states-space-force/.
[10] Department of Defense, "UNITED STATES SPACE FORCE STRATEGIC OVERVIEW," February 2019, https://media.defense.gov/2019/Mar/01/2002095012/-1/-1/1/UNITED-STATES-SPACE-FORCE-STRATEGIC-OVERVIEW.PDF.
[11] Department of the Air Force, "Comprehensive Plan for the Organizational Structure of the U.S. Space Force," 12.
[12] Department of the Air Force, 18.
[13] A specified combatant command normally is composed of forces from one military department. There are currently no specified combatant commands from Department of Defense, "Joint Publication 1: Doctrine for the Armed Forces of the United States. Change 1," July 12, 2017, IV–9, https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/jp1_ch1.pdf.
[14] Department of the Air Force, "Comprehensive Plan for the Organizational Structure of the U.S. Space Force," 18.
[15] Department of the Air Force, 18.
[16] Department of the Air Force, 18.

ability to do all things space for all the services. The Space Force will have to prioritize and some missions may not support the objectives of sister services. As stated earlier, the Air Force concern lies in what happens if Space Force priorities do not align with Air Force priorities. The "United States Space Force Strategic Overview" permits services to retain, as necessary, "organic space capabilities uniquely required to support the core mission of that Military Service."[17] Organic space capabilities are those that "uniquely and exclusively support a single Military Service's core domain-specific mission."[18] The permission to retain organic space capabilities bears great similarity to analogous phrasing in the Key West Agreement of 1948 discussed in chapter 4.

In the case of the Key West Agreement, both the Army and Navy retained aviation assets as organic to their core mission. The Navy argued that naval aviation was too intertwined with naval strategy to be apportioned off to a different service. Will the Navy use the same argument for space capabilities? Currently naval space capabilities reside in NAVSOC. NAVSOC is responsible for managing, maintaining, and operating satellite systems to provide service to warfighters in support of naval operations.[19] NAVSOC is a component command nested in NETWARCOM. NETWARCOM's mission is to "execute tactical-level command and control to direct, operate, maintain and secure Navy communications and network systems for Department of Defense Information Networks; leverage Joint Space capabilities for Navy and Joint Operations."[20] NETWARCOM serves as the US Navy's network and space command operating under control of TENTH Fleet. US TENTH Fleet or Fleet Cyber Command (FLTCYBERCOM) delivers tactical and operational effects in and through cyberspace, the electromagnetic spectrum, and space to ensure Navy and joint freedom of action.[21] The US Navy intertwined space and cyber functions into an organizational structure that focuses on harnessing space and cyberspace to increase lethality and effectiveness in the sea domain.

---

[17] Department of Defense, "UNITED STATES SPACE FORCE STRATEGIC OVERVIEW," 4.
[18] Department of Defense, 4.
[19] Joshua Wahl, "NAVSOC Holds Change of Command, Celebrates 50th Anniversary," Navy.mil, April 26, 2012, /submit/display.asp?story_id=66505.
[20] "NAVNETWARCOM Home," accessed February 28, 2020, https://www.public.navy.mil/fltfor/nnwc/Pages/default.aspx.
[21] "U.S FLEET CYBER COMMAND Mission & Vision," accessed February 28, 2020, https://www.public.navy.mil/fcc-c10f/Pages/usfleetcybermission.aspx.

The Army defended Organic Aviation by claiming it was intertwined and essential to ground commanders accomplishing their mission. Regarding space, the Army similarly intertwines and relies on its space capabilities for other mission functions. The USAMDC's mission is to "[develop] and [provide] current and future global space, missile defense, and high-altitude capabilities to the Army, joint force, and our allies and partners."[22] Like the Navy, the Army will have to determine how much of the space capabilities provided by USAMDC are domain-specific versus joint. Unlike the Navy, the Army did not combine space and cyber into one organization.

The separation of Army space capabilities might be easier in that the Army may retain missile defense responsibilities while the Space Force takes on the preponderance of space operations. The classified and controlled nature of space capabilities makes detailing which exact space capabilities are domain-specific capabilities a challenge. One can expect difficult negotiations within the DoD to determine which space capabilities the Space Force will assume from the Army and Navy. Intertwined operations essential to domain dominance was a critical argument in the Key West Agreement in determining organic aviation capabilities for both the Army and Navy. However, satellites are a more limited resource than airplanes. As highlighted chapter 5, the differences between the air and space domains prevent a direct comparison. Despite the additional considerations regarding space assets, organizations tend to follow precedence. Interservice rivalry still exists and concerns over the Space Force possessing undue influence over the space requirements of sister services are valid. The Army and Navy may choose to fight to retain jurisdiction control over some space capabilities. How should the Air Force approach this challenge?.

Unlike the Army and Navy, at the time of its designation as the Space Force, AFSPC's mission did not intertwine with other mission areas such as cyberspace or missile defense. According to the AFSPC history, cyberspace and space operations previously resided within a single command. When the Air Force expanded its mission areas to include cyberspace, the Air Force charged AFSPC to conduct cyberspace operations.[23] As cyberspace operations expanded, the cyber mission moved to Air

[22] "U.S. Army Space & Missile Defense Command - About Us."
[23] "AFSPC History."

Combat Command in 2018 and eventually became Air Forces Cyber in 2019.[24] The Air Force divided cyberspace and space operations so AFSPC could focus on the growing space mission.[25] Similar to the Army, the Air Force also previously combined space and missiles. AFSPC acquired responsibility over intercontinental ballistic missile (ICBM) forces in 1993; however, after the activation of Global Strike Command in 2009, AFSPC transferred responsibility over ICBMs to the new command.[26] The end result was that as of December 20, 2019, the only mission focus area of AFSPC was space. With the conversion of AFSPC to the Space Force, the Air Force has no organization dedicated to space capabilities. Despite lacking a space organization and relinquishing OT&E responsibilities to the Space Force, the Air Force is still expected to maintain representation in USSPACECOM. As such, this thesis recommends that the Air Force create a new organization focused on organic space capabilities. Much like the burgeoning Air Service began in the Signal Corps and organic Army aviation began in Field Artillery, so too should the Air Force create a home for organic space nested within an already established command.

This thesis recommends that the resurrected Air Force space organization structure draw from the example of the Navy. The US Navy intertwined space and cyber functions into one command structure that focuses on harnessing space and cyberspace to increase lethality and effectiveness in the sea domain. The Navy's example of intertwining space and cyberspace is a more appropriate archetype than the Army's mingling of space and missile defense. Space capabilities are more closely interdependent on cyberspace than they are on global strike mission. Space architectures that enable space capabilities rely on terrestrial cyberspace networks and the electromagnetic spectrum (EMS).[27] The Air Force already has a cyber command that manages the critical cyberspace networks.

This thesis recommends that the Air Force create a space component within Sixteenth Air Force (Air Forces Cyber). Just as the Navy incorporates the space domain into TENTH Fleet's mission, so should the Air Force include space operations into 16th

[24] "Sixteenth Air Force (Air Forces Cyber) - About Us," Sixteenth Air Force, accessed February 28, 2020, https://www.16af.af.mil/About-Us/.
[25] "AFSPC History."
[26] "AFSPC History."
[27] Kenny Grosselin et al., "Space Capstone Publication - A: Spacepower (v2.0)," February 2020, 6.

Air Force's mission. Air Forces Cyber's mission is to integrate "multisource intelligence, surveillance, and reconnaissance, cyber warfare, electronic warfare, and information operations capabilities" to enhance the USAF's lethality and operational success.[28] The creation of the Space Force presents an opportunity to combine the two missions within one command as the scope of future space operations in the Air Force will be much reduced. Air Forces Cyber serves to enhance USAF lethality by managing multisource intelligence from different domains. Expanding the mission of Air Forces Cyber to include space capabilities would not change the overall mission but just add additional means. Further studies should determine the size of the new space component. A group or a wing might be appropriate to fulfill the Air Force space mission. The Air Force space mission should not duplicate the mission of the Space Force but focus on supporting core service missions and domain-specific capabilities.

The Air Force's core missions are air and space superiority; intelligence, surveillance, and reconnaissance (ISR); rapid global mobility; global strike; and command and control.[29] Table 1 lists the Air Force and Space Force core missions' side-by-side for comparison purposes.

[28] "Sixteenth Air Force (Air Forces Cyber) - About Us."
[29] "Air Force Core Missions," U.S. Air Force, August 15, 2013, https://www.af.mil/News/Article-Display/Article/466868/air-force-core-missions/.

Table 1: Air Force and Space Force Core Missions

Service Core Missions	
Air Force	Space Force
• Air and Space superiority • Intelligence, Surveillance, and Reconnaissance (ISR) • Rapid Global Mobility • Global Strike • Command and Control	• Space superiority • Space Domain Awareness • Offensive and Defensive Space Control • Command and Control of Space Forces/Satellite Operations • Space Support to Operations • Space Service Support • Space Support to Nuclear Command, Control, Communications and Nuclear Detonation Detection • Missile Warning and Space Support to Missile Defense Operations.

Source: Air Force missions sourced from "Air Force Core Missions," U.S. Air Force, August 15, 2013, https://www.af.mil/News/Article-Display/Article/466868/air-force-core-missions/ and Defense Primer: The United States Air Force" (Congressional Research Service, January 21, 2020), 1, https://fas.org/sgp/crs/natsec/IF10547.pdf. Space Force missions sourced from Department of the Air Force, "Comprehensive Plan for the Organizational Structure of the U.S. Space Force," February 2020, 6, https://velosteam.com/wp-content/uploads/2020/02/Space-Force-Report.pdf.

According to "Defense Primer: United States Air Force" released by the Congressional Research Service, while the Air Force is ceding space superiority to the Space Force, other missions still rely on space.[30] There are overlapping areas in the core missions of the two services. For example, areas of Air Force command and control coincide with Space Force's command and control of space forces/satellite operations. Although the Space Force has the responsibility of command and control for satellite operations, the USAF uses space assets and space control operations to maintain and defend global communications networks critical to command and control.[31] The USAF also relies on space assets for ISR to provide data to policy makers, and USAF warfighters. Space control and information unique to USAF warfighters should be the purview of the Air Force and not the Space Force. While the Space Force strives to

[30] "Defense Primer: The United States Air Force" (Congressional Research Service, January 21, 2020), 1, https://fas.org/sgp/crs/natsec/IF10547.pdf.
[31] "Defense Primer: The United States Air Force," 1.

provide space support to operations, USAF core missions are heavily dependent on space capability.

The overlapping areas in core missions are similar to the overlapping areas of service functions in the NSA of 1947 and the Key West Agreement. The services can expect future negotiations to arbitrate the gray areas in mission overlap. However, the solution of assigning one service strategic responsibility demonstrated in the Key West Agreement will not work in this situation. The strategic compression inherent in space operations prevents separating space assets into strategic, operational, or tactical. A more appropriate method of arbitrating the use of space assets is through space control.

This thesis recommends that the USAF should retain tactical *control* capability of space assets as required. As stated in chapter 5, all military services rely on space for successful operations. Although the Space Force intends to support the operations for all services, bureaucratic processes and prioritization may limit the scope and efficiency of support. While the Air Force previously managed space control to provide effects to joint commanders, some of the space effects flowed indirectly by supporting air commanders. The space effects were not an end in themselves but a means to an end. While most space-based capabilities and effects remain classified, some services essential to air commanders included spaced-based surveillance for ISR and interdiction missions.

Tactical control of space assets would be appropriate during Air Force specific missions that do not include joint forces. This is similar to when Organic Aviation pilots performed better at directing artillery fire than AAF pilots.[32] Placing trained artillery officers in the cockpits produced better results because they understood the intricacies of artillery warfare better than AAF pilots. Air Force space operators should be able to provide tactical control as they would better understand the air commanders intent than Space Force operators in a different service. The Air Force space operators integrated and most likely operationally collocated with the overall space control system should be allowed assume tactical control of satellites when only providing localized support to the Air Force.

Allowing a USAF component to have tactical control of space assets aligns with the comprehensive command and control plan for spacepower. Robust command and

[32] Williams, *A History of Army Aviation*, 36.

control, as explained in the Spacepower Capstone Publication, incorporates "tactical level initiative and decentralized execution" to the "unique character of global space operations."[33] Robust command and control allows a closely meshed and integrated space control effort led by the Space Force to cede tactical control of space assets to tactical commanders. Operational commanders may delegate authority and responsibility to tactical commanders.[34] When correctly executed, robust command and control allows tactical creativity, mission accomplishment, and interdependent action without sacrificing global space capabilities.[35] Air Force space operators working in support of Air Force core missions would work with the Space Force. While codifying the command structure may be challenging, Air Force space operators already employ this command and control model for space operations.

This thesis recommends that the Air Force retain some of its space operators and not transition all of them to the Space Force. The Air Force currently has numerous space professionals assigned to various defense agencies across the DoD.[36] The Space Force plans to replace Air Force personnel with Space Force personnel. While it is important for the Space Force to take on these roles, the Air Force should not lose the knowledge that resides in these positions. The Air Force's current space operators use the 13SX Air Force Specialty Code (AFSC) for officers and 1C6X1 AFSC for enlisted.[37] The current Space Force transition plan is for space operators to transition into the Space Force or cross-train into another AFSC.[38] The Air Force, however, should retain some space operators and not eliminate its space-focused AFSCs. A new Air Force space component would need their expertise. Letting go of space professionals will create a void that will hamper the growth and effectiveness of the new space component.

The recruitment struggles of the Army's Organic Aviation serve as a cautionary

[33] Grosselin et al., "Space Capstone Publication - A: Spacepower (v2.0)," 59.
[34] Grosselin et al., 59.
[35] Grosselin et al., 61.
[36] Department of the Air Force, "Comprehensive Plan for the Organizational Structure of the U.S. Space Force."
[37] "Officer AFSC Classifications," U.S. Air Force, November 20, 2012, https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104484/officer-afsc-classifications/; "Enlisted AFSC Classifications," U.S. Air Force, August 17, 2015, https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104609/enlisted-afsc-classifications/.
[38] Sandra Erwin, "Space Force Official: Transfers of Military Personnel to Space Force Are Strictly Voluntary - SpaceNews.Com," SpaceNews, February 27, 2020, https://spacenews.com/space-force-official-transfers-of-military-personnel-to-space-force-are-strictly-voluntary/.

tale against releasing qualified operators in a demanding field. At its inception, Organic Aviation struggled to recruit and retain pilots due to competition from the AAF and manpower demands of WWII.[39] The AAF attracted the same qualified pool of candidates the Army needed. Due to the shortage of available aviation cadets, Organic Aviation tried to supplement the pilot pool with enlisted pilots. Mission effectiveness required experienced officer pilots, so Organic Aviation decreased the use of enlisted pilots. After the independence of the Air Force, Army aviation still struggled to acquire and retain qualified personnel. The Army introduced the warrant officer program as an attempt to bridge the gap between experienced officers and qualified enlisted personnel.[40] The Army also recruited Air Force and Navy veterans to fill its pilot pool. Today, the USAF has a chance to minimize the struggles faced by the Army by not forcing its space professionals out of the Air Force.

Instead of forcing out space professionals, the Air Force should use these individuals to develop Air Force space training programs. The Air Force emphasis on space education has increased over the last five years.[41] The creation of the Space Force should not stop this trend within the Air Force. The Air Force should continue to use its space professionals as educators for the next generation of Air Force Space Officers. The future growth of the Air Force's space focus will need a location with qualified cadre to develop doctrine. The Air Force should plan to maintain the Schriever Scholars program, a space-centric intermediate developmental education program located at Maxwell AFB, Alabama. As the Space Force grows, one can expect it to develop its on educational system. This should not dissuade the Air Force from focusing on space education. The similar but differing focus on the appropriate use of space may necessitate an Air Force specific course educating space professionals on their role in the Air Force mission.

In summation, the Air Force should consider creating a space component within Air Forces Cyber ready to support Air Force core missions. This component would not duplicate Space Force missions but rather would work with the Space Force. The Space Force is responsible for overall space control operations and rightfully so. The Air Force

[39] Williams, *A History of Army Aviation*, 37.
[40] Williams, 51.
[41] Rachel S. Cohen, "Building a Better Space Training Pipeline," Air Force Magazine, July 19, 2019, https://www.airforcemag.com/building-a-better-space-training-pipeline/.

space component would also be the Air Force's representation in USSPACECOM. The recommended space component incorporates the lessons learned from organic aviation while acknowledging the influence of the Goldwater-Nichols Act and the differences between the air and space domains.

Technology

The Air Force should not pursue independent research and development into space technology. Doing so would duplicate the efforts of the Space Force and violate the intent of the Goldwater-Nichols Act. The current operational environment is unlike that experienced by organic Army aviation. The Pace-Finletter agreements and Wilson Memorandums between the Army and Air Force covered in chapter 4 do not serve as an apt example for future Air Force actions. Restricting Army fixed-wing aircraft weight to 5,000 pounds and helicopter weight to 20,000 pounds worked due to the nature of the air domain.[42] Placing physical restrictions on aircraft limited the technological capability of aircraft in the air domain. The Army prioritized procuring helicopters and light fixed-wing aircraft via the Air Force to support ground commanders. Lighter and smaller aircraft restricted capability to solely meeting ground commanders needs without encroaching on Air Force missions.

This model does not work when applied to the Air Force and Space Force challenge. Helicopters and light fixed-wing aircraft provided localized benefits to the Army. Space assets in orbit provide global, not localized, benefits. While operators may acquire tactical control for specific missions, space assets are inherently global. While the size of a satellite might affect its capability, neither size nor weight is an appropriate delineator in determining satellite function. The joint multi-role capabilities of satellites coupled with the high-cost of procurement further supports the argument for single-service procurement of space technologies.

The Space Force is responsible for equipping the nation's space forces. According to the FY 2020 NDAA, the Assistant Secretary of the Air Force for Space Acquisition and Integration is responsible for synchronizing acquisition projects for space systems

[42] Alfred Goldberg, *A History of the United States Air Force 1907-1957* (Princeton, N.J: D. Van Nostrand Company, INC, 1957), 118.

and programs through the Space Rapid Capabilities Office and Space Development Agency.[43] The Air Force should liaise with the Space Force to ensure that future space technology accounts for Air Force operational requirements. The recency of separation of the two services aligns the Space Force mission with the Air Force's needs. Space Force personnel are still performing the same missions they executed when in the Air Force. Over time, the Space Force's technological focus may deviate from Air Force's needs. However, the fairly significant cost of developing and launching satellites still deters duplication of effort in technology procurement. The Air Force emphasis should be on cooperation to ensure that Space Force OT&E continue to account for Air Force needs.

Since both the Space Force and the Air Force are within the Department of the Air Force, the Secretary of the Air Force (SECAF) is the corresponding decision authority for air and space requirements. This command structure could mitigate some of the friction encountered by the Army when it tried to grow its Organic Aviation program. The Army had to rely on the Air Force for the procurement of helicopters, which required negotiations between the Secretaries of the Air Force and Army to foster progress.[44] The Air Force and Space Force should expect better coordination in aligning requirements and technology. Acquisition oversight residing in a single office should help eliminate redundancy and inter-service disagreements. The Air Force should push for space capabilities that enhance the application of airpower.

Physical environment

The air domain is the home of the Air Force—space is not an extension of the air domain but is its own domain. Before the establishment of the Space Force, aerospace advocates referred to space as the ultimate high-ground and treated the two domains as indivisible.[45] In 1958, Air Force Chief of Staff General Thomas White enunciated the term aerospace and characterized air and space as an indivisible continuum extending from the surface of the earth to infinity.[46] The characterization of air and space as

[43] United States Congress, "National Defense Authorization Act For Fiscal Year 2020," December 17, 2019.
[44] Williams, *A History of Army Aviation*, 54–54.
[45] Benjamin S. Lambeth, *Mastering the Ultimate High Ground: Next Steps in the Military Uses of Space* (Santa Monica, CA: RAND, Project Air Force, 2003), 60.
[46] Lambeth, 37.

indivisible ignores several key factors, however. There is a traverse region where air-breathing aircraft cannot sustain flight and satellites cannot remain in orbit. This 60-mile band starts at 28 miles above the earth's surface and ends at around 93 miles above the earth's surface.[47] Current technological limitations restrict all flight in this region to transitory ballistic profiles. As such, neither the Air Force nor the Space Force can lay claim to conducting operations in this traverse region. This buffer region serves as an efficient demarcation of the air and space domain. The Space Force transitions through the air domain when launching satellites, but satellite operations are conducted in the space domain. In contrast, Air Force jurisdictional control only extends as far as the buffer region.

Despite the lack of jurisdictional ownership, the Air Force still relies on operations in the space domain across the various orbits. Similar to separating the air domain into low-altitude, medium-altitude, and high-altitude operations, so too is the space domain bifurcated in GEO, HEO, MEO, and LEO. Figure 9 lists the common uses of the various orbits.

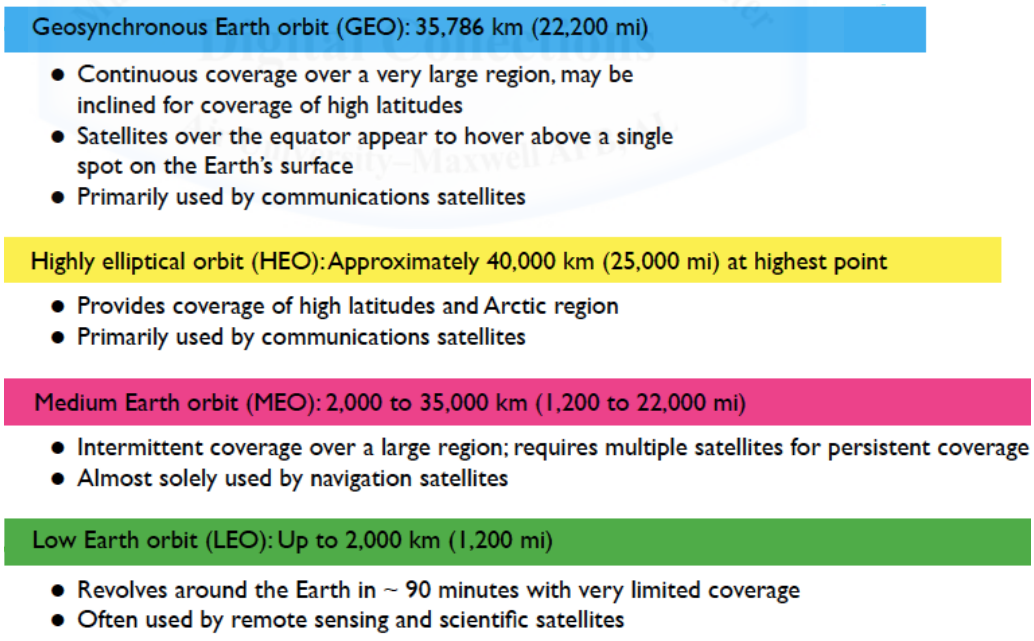

Figure 9 Uses of Space Orbits
Source: NASIC Public Affairs Office, "Competing in Space" (Wright-Patterson Air Force Base, OH: National Air and Space Intelligence Center, December 2018), 11, https://www.nasic.af.mil/Portals/19/documents/Space_Glossy_FINAL--

[47] Lambeth, 61.

15Jan_Single_Page.pdf?ver=2019-01-23-150035-697.

All the different orbits support Air Force core missions. For example, space-based surveillance radars designed to supplement or replace Air Force assets like AWACS and JSTARS will operate in LEO.[48] LEO and MEO orbits enable remote sensing capabilities that support ISR missions. GEO provides persistent coverage over a geographic location, but LEO enables better resolution.[49] HEO and GEO satellites are great for communications satellites due to the extensive coverage area.

This thesis recommends that the Air Force be prepared to seek jurisdictional access to all orbits in support of Air Force core missions. The global nature of satellites prevents the Air Force from mimicking the actions of Army Organic Aviation. The Pace-Finletter agreements and Wilson Memorandums between the Army and Air Force emphasized the importance of definitions in roles and missions as well as boundaries on physical environment. The agreements limited the range of Organic Aviation to within 100-miles of the front lines.[50] Enacting a distinction in orbital jurisdiction between the Air Force and Space Force is not the correct solution. A better solution is to allow Air Force space operators tactical control of satellites no matter the orbit. The Space Force will maintain space domain awareness of all orbits and satellites in space, and the Air Force should be granted tactical control of specific satellites as needed in support of Air Force specific missions.

Culture

This thesis recommends the Air Force re-instill an air-centric identity by enacting Edgar Schein's turnaround strategy of generating cultural change. Turnaround makes the organization more adaptive by rapidly transforming parts of the culture.[51] The Air Force does not need to enact an entirely new culture; the Air Force needs to emphasize its air-centric artifacts. These include the Air Force's origin stories, inspiring Airmen, and Air Force aircraft. Turning around the Air Force's culture should follow Schein's three stages

[48] Kimberly M. Corcoran, "The Mechanics of Space Operations," Higher Eyes in the Sky (Air University Press, 1999), 16, JSTOR, https://www.jstor.org/stable/resrep13864.8.
[49] Corcoran, "The Mechanics of Space Operations," 16.
[50] Goldberg, *A History of the United States Air Force 1907-1957*, 53.
[51] Edgar H. Schein, *Organizational Culture and Leadership*, 4. ed, The Jossey-Bass Business & Management Series (San Francisco, Calif: Jossey-Bass, 2010), 293.

of cultural change: unfreezing, learning new concepts and new meanings for old concepts, and internalizing new concepts.

The separation of the Space Force is the first step in unfreezing that generates disequilibrium necessary to undertake cultural change. The uncertainty of the Air Force's path to remain the strongest Air Force in the world generates anxiety, an important second component of unfreezing. Anxiety rises from facing the new reality of a divided Air and Space Force. Finally, unfreezing requires strong leadership from the Chief of Staff of the Air Force (CSAF) and the SECAF to provide psychological safety. Psychological safety allows Air Force members to accept the risk inherent in cultural change. This thesis will provide recommendations for the SECAF and CSAF using Schein's eight activities leaders must execute to provide adequate psychological safety.

The first recommendation for Air Force leadership is to put forth a compelling positive vision. The Department of the Air Force is already underway with this task. On 27 February 2020, SECAF sent an email to all Air Force members detailing the positive vision for the Department of the Air Force.[52] The Secretary envisions the Air Force and Space Force working together to pursue a united goal of implementing the NDS. The CSAF should also put forth a compelling positive vision of the USAF fighting from and within the air domain to accomplish its mission. This vision should emphasize the historical, cultural artifacts of the USAF, as well as its ability to conduct strategic air operations that no other service can perform. The CSAF's vision should advocate for using space as a supporting domain to enhance fighting from and within the air domain.

Air Force leadership should revise formal training for space operators. Previous training of space operators included fighting from and within space to secure military and political objectives. That is no longer the responsibility of the Air Force. Future training for Air Force space operators should focus on supporting the Air Force mission from space. The change in formal training should not be a large leap, but it must include space operators. As Schein emphasizes, the learner must be involved in the training and change process to prevent a top-down bias.[53] Air Force space operators can go through the same initial training with their Space Force counterparts, but the Air Force should provide an

[52] Barbara Barrett, "Department of the Air Force Priorities," February 27, 2020.
[53] Schein, *Organizational Culture and Leadership*, 306.

air-centric top-off. The Schriever Program at Air University at Maxwell AFB, Alabama, should be a suitable location to expand, develop and conduct air-centric space training.

Changing underlying assumptions will take time and will also require more actions than training. Air Force leadership should conduct exercises to test operations under the new vision. These exercises should include the Space Force and will serve as Schein's practice fields.[54] During these exercises, the USAF should focus on determining new concepts of operations, developing and revising necessary doctrine, and refining training needs. This aligns with the Space Force vision to undertake initiatives seeking a joint warfighting doctrine.[55] The exercises should bake in an air-centric focus while allowing the Space Force to fulfill space-centric roles. Doing so will allow the Air Force to develop new systems and structures consistent with the CSAF's positive vision.

The Chief and other senior flag officers should serve as positive role models reflecting the new direction. For Airmen joining the Air Force from now on, there is an Air Force and a separate Space Force. There is not an Air and Space Force. Senior leaders set the tone in moving the service forward by embracing and championing the new path instead of lamenting about the previous era of operations. The transition will not be seamless, and the Air Force must establish working groups that tackle issues that arise. These working groups should integrate feedback from frank discussions.[56] Senior leader support and incorporating recommendations from working groups will go a long way in changing the espoused beliefs and underlying assumptions of the Air Force.

The next step for Air Force leaders will be to internalize the new concepts via cognitive restructuring and refreezing. The Air Force should cognitively restructure the service by attaching new concepts and meaning to old concepts. Imitation provides the best means to provide new meanings to old concepts, and imitation requires a leader that is a role model for the organization. The CSAF is the best leader to serve as a role model as the Chief is the highest-ranking Air Force member. An enduring concept inherent to the Air Force is the ability to fight and win the nation's wars from the air. The meaning the Chief should bring is not new, but rather a return to a neglected past. The Air Force

[54] Schein, 306.
[55] Department of the Air Force, "Comprehensive Plan for the Organizational Structure of the U.S. Space Force," 18.
[56] Schein, *Organizational Culture and Leadership*, 306.

morphed from being air-centric to treating air and space as indivisible.

The Air Force's move into becoming an aerospace force stemmed in part from preventing challenges to the dominance of strategic bombers. One of the reasons the Air Force laid claim to ICBMs was to enforce its jurisdictional claim on strategic warfare and reduce the other services' footprint and budgetary dollars in strategic warfare.[57] By claiming that space was an extension of the air domain and ICBMs were strategic assets, the Air Force fought to become the lead service in charge of space.[58] This fight for space supremacy within the Air Force morphed the service's identity from independence-minded strategic bombing to an aerospace-blended inclusion of bombers and ICBMs. ICBMs, using ballistic profiles, provided a means to reach out and attack the enemy faster than bombers could.

The Air Force laid claim to ICBMs based on the argument that attacks or engagements beyond battlefield interdiction were the purview of the Air Force.[59] ICBMs were the Air Force's entry into a space mission that grew to become its own command with 16,000 personnel.[60] Although ICBMs were the Air Force's entry into space, the space mission changed so much that ICBMs were re-assigned to Global Strike Command and not the Air Force Space Command.[61] Separating ICBMs from Air Force Space Command acknowledged that the strategic capability of missiles transitioning through space differed from satellite operations from and within space.

The division of the Air Force and Space Force presents an opportunity for the Air Force to turn around its cultural focus. The CSAF should emphasize the strategic capability of the Air Force from and within the air domain. Air Force doctrine supports using a focus on airpower as a unifying tool and advocates that senior leaders to "use concepts and language that bind Airmen together instead of presenting the Air Force as a collection of tribes broken out in technological stovepipes according to the domain of air,

---

[57] Lambeth, *Mastering the Ultimate High Ground*, 10.
[58] Lambeth, 15.
[59] Lambeth, 13.
[60] Sandra Erwin, "U.S. Space Force Has Lifted off, Now the Journey Begins - SpaceNews.Com," SpaceNews, January 24, 2020, https://spacenews.com/u-s-space-force-has-lifted-off-now-the-journey-begins/.
[61] ICBMs were previously assigned to Air Force Space Command but moved to Air Force Global Strike Command in 2009. "Air Force Global Strike Command," U.S. Air Force, accessed March 24, 2020, https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104462/air-force-global-strike-command/; "AFSPC History."

space, and cyberspace."[62] By focusing on airpower with space in a supporting role, the CSAF will cognitively restructure Air Force culture. Successful Air Force operations will reinforce the new cultural paradigm and refreeze a new culture. The refreezing process requires successful results; if the changes recommended in this thesis do not result in a change of Air Force identity, CSAF should launch a new change process.

Air Force leaders should also work to change the external image of the Air Force. Hatch and Schultz define organizational identity as constituted by a dynamic set of processes that interrelate culture and image.[63] As such, when trying to determine the future identity of the USAF, Air Force leaders should also consider the Air Force's external image. The external image of the Air Force is that of a technological force. The reliance on technology, such as airplanes to access the air domain, laid the foundation for the service's reputation. As warfare moved into the space domain, the importance of technology increased. Emerging space technology increased the use of space as a warfighting domain. The Air Force tried to manage its prioritization of air and space missions.[64] The increased capability of space as a warfighting domain resulted in the creation of the Space Force. The division of the Space Force presents an opportunity for the Air Force to change its identity and external image.

The Air Force should focus on establishing an air-breathing identity and emphasize its independent war-winning capability through airpower and use space as a force enhancer. Hatch and Schultz argue that identity expresses an organization's cultural understandings, and in turn, the expressed identity leaves an impression on others outside the organization. The discussion above elucidates how the Air Force can change its culture. Doing so will result in a new, expressed identity that affects the external image of the Air Force. The expressed identity of the Air Force should be a service capable of gaining air superiority and performing strategic attack against peer competitors. The Air Force's technological focus should support these goals. Air Force space should be used as an enhancer to prepare and support actions in and from the air domain.

---

[62] United States Air Force, "Volume 1 Basic Doctrine: Airpower," February 27, 2015, 2, https://www.doctrine.af.mil/Portals/61/documents/Volume_1/V1-D21-Airpower.pdf.
[63] Mary Jo Hatch and Majken Schultz, "The Dynamics of Organizational Identity," *Human Relations* 55 (2002): 997.
[64] Lambeth, *Mastering the Ultimate High Ground*, 34.

Conclusion

This thesis opened with the question of what the USAF should look like after the creation of the Space Force. To better express and focus the question, the thesis addressed two sub-questions: what should be the ensuing identity of the USAF and what elements of space should the USAF retain. In *Analogies at War,* Yuen Khong defines analogies as intellectual devices used by policymakers to help define the nature of a problem and suggest possible solutions to the problem.[65] Analogies compare the new situation facing a decision maker to a more-familiar previous situation. However, Khong cautions that when applying analogies, policy-makers should also be aware of the differences between the two situations.[66]

In search of an answer to the two sub-questions, the thesis used the establishment of the Air Force in 1947 as an analogy to the creation of the Space Force. The creation of the Space Force is like the situation in 1947 in that a new military service was carved out of an existing service; it is unlike the situation in 1947 in that military operations focus on joint integration (Goldwater-Nichols Act) and the space domain presents unique challenges unseen in the air domain. The thesis traversed a historical bridge built upon historical lessons from the USAF's creation and the effect of the Army and Navy. Incorporating the differences between the two situations helped distill useful recommendations for the Air Force in four analytical areas of organization, technology, physical environment, and culture. Table 2 is a summary of the recommendations provided in this chapter.

[65] Yuen Khong, *Analogies at War: Korea, Munich, Dien Bien Phu, and the Vietnam Decisions of 1965*, Princeton Paperbacks (Princeton, NJ: Princeton University Press, 1992), 20–21.
[66] Khong, 256.

Table 2: Summary of Recommendations

Air Force Recommendations	
Organization	• Create a space component within Air Forces Cyber • Retain Air Force space professionals and do not eliminate the space AFSC or transition all over to the Space Force
Technology	• Do not pursue independent development of space assets • Work with space force to secure tactical control of space assets in support of service specific missions
Physical Environment	• Do not claim jurisdiction over orbits in space.
Culture	• Instill an air-centric mindset • Emphasize air-centric artifacts—stories, war heroes, aircraft • Positive vision of Air Force future from CSAF and senior leaders • Focus on Air Force narrative on capability from and within the air

Source: Author's original work

Regarding culture, the CSAF should use the creation of the Space Force as an opportunity to establish an air-centric identity that revolves around airpower. The ensuing identity of the USAF should be an air-centric service devoted to winning the nation's war through decisive action in and from the air domain. The Air Force's identity should not focus on warfighting in other domains such as space, but rather on the use of adjoining domains as force-enhancers to increase the effectiveness in the air domain. The initial Air Force identity was rooted in the independent strategic war-winning capability of airpower. The presence of the Space Force frees the Air Force from winning in space. It is time for the Air Force to return to its roots and focus on the air domain.

As to the question of what elements of space the USAF should retain, the Air Force should create a space component within Air Force Cyber to serve as the Air Force's representation in USSPACECOM as well as a development ground for Air Force space professionals. The new organization should foster the training of ALO-Ss to integrate with the Space Force. The Air Force should not pursue independent development of space technologies but should liaise with the Space Force to ensure

appropriate consideration of Air Force needs. Similarly, the Air Force should not attempt to carve out a portion of space orbits for Air Force use but should seek access to tactical control of necessary satellites within overall Space Force control. The separation of the Space Force freed the Air Force from space warfighting and presents an opportunity for the Air Force.

The creation of the Space Force presents an opportunity for the Air Force to re-examine its identity. The past is a good starting reference point, and this thesis looks at the birth of the Air Force as one such reference. The birth of the Air Force also generates lessons learned from the actions of the other services. The motto of the School of Advanced Air and Space Studies applies here; "From the past, the future." From its past, the Air Force should apply lessons learned to determine its future identity and roles and missions in space.[67]

[67] "Welcome to the School of Advanced Air and Space Studies (SAASS)," Air University (AU), accessed March 25, 2020, https://www.airuniversity.af.edu/SAASS/Display/Article/802939/welcome-to-the-school-of-advanced-air-and-space-studies-saass/.

Bibliography

Academic Papers

Fredrikson, Brian E., and Air University. Globalness: Toward a Space Power Theory [.Mil Access Only]. Maxwell AFB, Ala.: School of Advanced Air and Space Studies, 2006. Web.

Norsky, Peter C. The United States Space Force: Not If, but When [.Mil Access Only]. Maxwell AFB, Ala.: School of Advanced Air and Space Studies, 2016. web.

Ramsden, Robert L. Space Capabilities and Functional Organizations: An Analysis of Space Integration since Desert Storm [.Mil Access Only]. Maxwell AFB, Ala.: School of Advanced Air and Space Studies, 2006. Web.

Vital, Mark D. "The Key West Agreement of 1948: A Milestone for Naval Aviation." Master's Thesis, Florida Atlantic University, 1999.

Ziarnick, Brent D. Tough Tommy's Space Force: General Thomas S. Power and the Air Force Space Program [.Mil Access Only]. Maxwell AFB, Ala.: School of Advanced Air and Space Studies, 2016. web.

Articles

Air Force Historical Research Agency. "The Birth of the United States Air Force," January 9, 2008. https://www.afhra.af.mil/About-Us/Fact-Sheets/Display/Article/433914/the-birth-of-the-united-states-air-force/.

Barrett, Barbara. "Department of the Air Force Priorities," February 27, 2020.

Cohen, Rachel S. "Building a Better Space Training Pipeline." Air Force Magazine, July 19, 2019. https://www.airforcemag.com/building-a-better-space-training-pipeline/.

Colby, Elbridge. From Sanctuary to Battlefield: A Framework for a U.S. Defense and Deterrence Strategy for Space, 2016.

Cole, Ronald H. "Grenada, Panama, and Haiti: Joint Operational Reform." JFQ: Joint Force Quarterly Autumn/Winter (99 1998): 57–64.

Corcoran, Kimberly M. "The Mechanics of Space Operations." Higher Eyes in the Sky. Air University Press, 1999. JSTOR. https://www.jstor.org/stable/resrep13864.8.

Elkins, Kel. "SVS: Kepler's Laws of Planetary Motion Described Using Earth Satellites." NASA Scientific Visualization Studio. Accessed April 16, 2020. https://svs.gsfc.nasa.gov/4642.

Erwin, Sandra. "Space Force Official: Transfers of Military Personnel to Space Force Are Strictly Voluntary - SpaceNews.Com." SpaceNews, February 27, 2020. https://spacenews.com/space-force-official-transfers-of-military-personnel-to-space-force-are-strictly-voluntary/.

Erwin, Sandra. "U.S. Space Force Has Lifted off, Now the Journey Begins - SpaceNews.Com." SpaceNews, January 24, 2020. https://spacenews.com/u-s-space-force-has-lifted-off-now-the-journey-begins/.

Federation of American Scientists. "B-47 Stratojet United States Nuclear Forces."

Accessed April 6, 2020. https://fas.org/nuke/guide/usa/bomber/b-47.htm.
Frisbee, John L. “The GHQ Air Force.” Air Force Magazine, August 29, 2008. https://www.airforcemag.com/article/0983ghq/.
Green, Brian D. “Space Situational Awareness Data Sharing: Safety Tool or Security Threat.” Air Force Law Review 75 (2016): 39–134.
Hampson, Joshua. “The Future of Space Commercialization.” Niskanen Center, January 25, 2017.
Hatch, Mary Jo, and Majken Schultz. “The Dynamics of Organizational Identity.” Human Relations 55 (2002): 989–1018.
Locher III, James R. “Taking Stock of Goldwater-Nichols.” JFQ: Joint Force Quarterly Autumn, no. 34 (1996): 9–16.
Martindale, Michael, and David Deptula. “Organizing Spacepower: Conditions for Creating a US Space Force.” Mitchell Institute Policy Paper 16 (August 2018).
Milks, Aubrey SrA. “Vandenberg All Call Addresses Future of Space.” United States Space Force, February 28, 2020. https://www.spaceforce.mil/News/Article/2101374/vandenberg-all-call-addresses-future-of-space.
National Museum of the United States Air ForceTM. “Mark 17 Thermonuclear Bomb,” May 29, 2015. http://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/197628/mark-17-thermonuclear-bomb/.
Ouchi, William G., and Alan L. Wilkins. “Organizational Culture.” Annual Reviews of Sociology 11 (1985): 457–83.
Ravasi, Davide, and Majken Schultz. “Responding to Organizational Identity Threats: Exploring the Role of Organizational Culture.” The Academy of Management Journal Vol. 49, no. No. 3 (June 2006): 433–58.
Sequeira, Vasco, Maria Queluz, António Rodrigues, Jose Sanguino, and Pedro Grifo. “Improving HF Communications Efficiency Using Evolved Data Rate Change Algorithms.” *Revista de Ciências Militares* VI (November 1, 2018): 233–58.
Union of Concerned Scientists. “Satellite Database | Union of Concerned Scientists,” December 16, 2019. https://www.ucsusa.org/resources/satellite-database.
Wahl, Joshua. “NAVSOC Holds Change of Command, Celebrates 50th Anniversary.” Navy.mil, April 26, 2012. /submit/display.asp?story_id=66505.
Weinzierl, Matthew. “Space, the Final Economic Frontier.” The Journal of Economic Perspectives 32, no. 2 (2018): 173–92.
Wolk, Herman S. “Planning and Organizing the Postwar Air Force 1943-1947.” Office of Air Force History, USAF, 1984. https://media.defense.gov/2010/Sep/28/2001329803/-1/-1/0/planning_and_organizing_the_postwar_af.pdf.

Books

Abbott, Andrew Delano. The System of Professions: An Essay on the Division of Expert Labor. Chicago: University of Chicago Press, 1988.
Biddle, Tami Davis. Rhetoric and Reality in Air Warfare: The Evolution of British and American Ideas about Strategic Bombing, 1914-1945. Princeton Studies in International History and Politics. Princeton, N.J.: Princeton University Press, 2004.

Boyne, Walter J. Beyond the Wild Blue: A History of the United States Air Force, 1947-1997. 1st ed. New York: St. Martin's Press, 1997.
Douhet, Giulio. The Command of the Air. Tuscaloosa, A.L.: The University of Alabama Press, 2009.
Goldberg, Alfred. A History of the United States Air Force 1907-1957. Princeton, N.J: D. Van Nostrand Company, INC, 1957.
Khong, Yuen. Analogies at War: Korea, Munich, Dien Bien Phu, and the Vietnam Decisions of 1965. Princeton Paperbacks. Princeton, NJ: Princeton University Press, 1992.
Schartz, Paul R. Evolution of the American Military Establishment Since World War II. Lexington, VA.: George C. Marshall Research Foundation, 1978.
Schein, Edgar H. Organizational Culture and Leadership. 3rd ed. The Jossey-Bass Business & Management Series. San Francisco: Jossey-Bass, 2004.
Schein, Edgar H. Organizational Culture and Leadership. 4. ed. The Jossey-Bass Business & Management Series. San Francisco, Calif: Jossey-Bass, 2010.
The Question of Autonomy for the United States Air Arm 1907-1945: Pt 2. Maxwell AFB, Ala.: Air University, 1950.
Williams, James W. A History of Army Aviation: From Its Beginnings to the War on Terror. New York: iUniverse, 2005.
Wolk, Herman S. The Struggle for Air Force Independence, 1943-1947. Rev. ed. Washington, D.C: Air Force History and Museums Program, 1997.

Government Documents

99th Congress. "Public Law 99-433 Goldwater-Nichols Department of Defense Reorganization Act of 1986," October 1, 1986. https://history.defense.gov/Portals/70/Documents/dod_reforms/Goldwater-NicholsDoDReordAct1986.pdf.
Air Force Space Command. "AFSPC History." Accessed March 25, 2020. https://www.afspc.af.mil/About-Us/AFSPC-History/.
Air University (AU). "Welcome to the School of Advanced Air and Space Studies (SAASS)." Accessed March 25, 2020. https://www.airuniversity.af.edu/SAASS/Display/Article/802939/welcome-to-the-school-of-advanced-air-and-space-studies-saass/.
CIA.GOV. "The National Security Act of 1947 – July 26, 1947." Accessed January 30, 2020. https://www.cia.gov/library/readingroom/docs/1947-07-26.pdf.
"Defense Primer: The United States Air Force." Congressional Research Service, January 21, 2020. https://fas.org/sgp/crs/natsec/IF10547.pdf.
Department of Defense. "Joint Publication 1: Doctrine for the Armed Forces of the United States. Change 1," July 12, 2017. https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/jp1_ch1.pdf
Department of Defense. "UNITED STATES SPACE FORCE STRATEGIC OVERVIEW," February 2019. https://media.defense.gov/2019/Mar/01/2002095012/-1/-1/1/UNITED-STATES-SPACE-FORCE-STRATEGIC-OVERVIEW.PDF.

Department of the Air Force. “Comprehensive Plan for the Organizational Structure of the U.S. Space Force,” February 2020. https://velosteam.com/wp-content/uploads/2020/02/Space-Force-Report.pdf.
Grosselin, Kenny, Casey Beard, Christopher Fernegel, Amber Dawson, Justin Dawson, Brandon Davenport, Etan Funches, et al. “Space Capstone Publication - A: Spacepower (v2.0),” February 2020.
Lambeth, Benjamin S. Mastering the Ultimate High Ground: Next Steps in the Military Uses of Space. Santa Monica, CA: RAND, Project Air Force, 2003.
NASIC Public Affairs Office. “Competing in Space.” Wright-Patterson Air Force Base, OH: National Air and Space Intelligence Center, December 2018. https://www.nasic.af.mil/Portals/19/documents/Space_Glossy_FINAL--15Jan_Single_Page.pdf?ver=2019-01-23-150035-697.
“NAVNETWARCOM Home.” Accessed February 28, 2020. https://www.public.navy.mil/fltfor/nnwc/Pages/default.aspx.
Sixteenth Air Force. “Sixteenth Air Force (Air Forces Cyber) - About Us.” Accessed February 28, 2020. https://www.16af.af.mil/About-Us/.
The White House. “Text of Space Policy Directive-4: Establishment of the United States Space Force,” February 19, 2019. https://www.whitehouse.gov/presidential-actions/text-space-policy-directive-4-establishment-united-states-space-force/.
Truman, Harry S. “Key West Agreement of 1948: Functions of the Armed Forces and the Joint Chiefs of Staff,” April 21, 1948. http://cgsc.cdmhost.com/utils/getfile/collection/p4013coll11/id/729/filename/730.pdf.
U.S. Air Force. “Air Force Core Missions,” August 15, 2013. https://www.af.mil/News/Article-Display/Article/466868/air-force-core-missions/.
U.S. Air Force. “Air Force Global Strike Command.” Accessed March 24, 2020. https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104462/air-force-global-strike-command/.
U.S. Air Force. “Enlisted AFSC Classifications,” August 17, 2015. https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104609/enlisted-afsc-classifications/.
U.S. Air Force. “Officer AFSC Classifications,” November 20, 2012. https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104484/officer-afsc-classifications/.
“U.S. Army Space & Missile Defense Command - About Us.” Accessed April 13, 2020. https://www.smdc.army.mil/ABOUT/.
“U.S FLEET CYBER COMMAND Mission & Vision.” Accessed February 28, 2020. https://www.public.navy.mil/fcc-c10f/Pages/usfleetcybermission.aspx.
United States Air Force. “Volume 1 Basic Doctrine: Airpower,” February 27, 2015. https://www.doctrine.af.mil/Portals/61/documents/Volume_1/V1-D21-Airpower.pdf.
United States Congress. “National Defense Authorization Act For Fiscal Year 2020,” December 17, 2019.
United States Space Command. “United States Space Command Fact Sheet.” Accessed April 13, 2020. http://www.spacecom.mil/About/Fact-Sheets-Editor/Article/1948216/united-states-space-command-fact-sheet/.
United States Space Force. “U.S. Space Force Fact Sheet.” Accessed March 23, 2020. https://www.spaceforce.mil/About-Us/Fact-Sheet.