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AIR COMMAND AND STAFF COLLEGE

AIR UNIVERSITY

BEYOND THE WILD BLUE YONDER: CREATING AN "AIR

AND SPACE" CULTURE IN TODAY'S AIR FORCE

by

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Preface

Having been in the space business for the past 12 years, I had an eye-opening experience at Air Command and Staff College, learning that space is not in everyone's vocabulary. It is not the technology that is not understood, it is the use for this technology within the Air Force mission. Currently, space is seen as a means to assist the Air Force pilot in gaining and maintaining air superiority. This is the culture of the Air Force today. However, the Air Force is now an air and space force, so future leaders need to understand the role space plays. I'd especially like to thank a few of the great air and space visionaries who provided their insights into air and space culture: General Howell M. Estes III, Major General Robert Dickman, Major General (S) H. Marshal Ward, and Mr Brent R. Collins. And finally, a special thanks to Major General (S) H. Marshal Ward for giving me the inspiration to evaluate today's Air Force culture, where we need to go, and how we can get there.

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Abstract

For the Air Force, military space is now in the limelight following the release of *Global Engagement: A Vision for the 21st Century Air Force*. This pamphlet includes the most important Air Force statement ever concerning the role of space in the future of the Air Force: "We are now transitioning from an air force into an air and space force on an evolutionary path to a space and air force." To make this transition, according to General Howell M. Estes III, Commander in Chief, United States Space Command, two major things must happen: "One of them is a cultural change. We all grew up with the air part of the Air Force, and many of us look at the space piece as being a little bit of a threat to the kinds of things that air power does. That attitude has to change." How can the Air Force create the culture necessary to transition from an air force to an air and space force?

Through research via the AU Library, I offer a definition of culture and discuss how culture develops and can be changed. I reviewed historical documentation at the Air University Historical Research Agency to gain historical insight into the formation of Air Force culture during the 1940s. I interviewed General Howell M. Estes III, Commander in Chief, United States Space Command, Major General Robert Dickman, DOD Space Architect, Major General (S) H. Marshal Ward, USAF/XOO, and Mr Brent Collins, PEO/Space, on their perspectives of the current Air Force culture and how to successfully transition to an air and space culture. Combining history with current thoughts, I have

articulated how the AF can successfully transition culturally, beyond the wild blue yonder, to an air and space force.

Chapter 1

Introduction

Toto, something tells me we're not in Kansas anymore.

—Dorothy in *The Wizard of Oz* by L. Frank Baum

How can the Air Force create the culture necessary to transition from an air force to an air and space force—to go beyond the wild blue yonder? For the Air Force, military space is now in the limelight following the release of *Global Engagement: A Vision for the 21st Century Air Force*. This pamphlet includes the most important Air Force statement ever concerning the role of space in the future of the Air Force: "We are now transitioning from an air force into an air and space force on an evolutionary path to a space and air force."[1] To make this transition, according to General Howell M. Estes III, Commander in Chief, United States Space Command, two major things must happen: "One of them is a cultural change. We all grew up with the air part of the Air Force, and many of us look at the space piece as being a little bit of a threat to the kinds of things that air power does. That attitude has to change."[2]

This research paper proposes tangible changes the Air Force can make to transition culturally to an air and space force. After defining culture, it discusses the development of culture, the stages of culture, and changes in culture. This foundation lays a common framework. Then, early air culture is discussed, followed by current Air Force culture. Literature reviews and interviews with leaders in the military space field lend credence to

the analysis of Air Force culture today and where we want to be tomorrow. Finally, a course is laid out to transition culturally to an air and space force.

Shortcomings of this paper are three-fold. First, only Air Force personnel were interviewed on current air culture and future air and space culture. Second, only written reference material was used to postulate a course to a homogeneous air and space culture within the Air Force. Interviews with experts in culture of non-profit organizations and/or military organizations may lead to more current theories. And third, this research assumes the Air Force will continue on the road to a space and air force. With the lack of a current superpower threat and the continuing decline in the defense budget, our civilian leadership may question the utility of continuing on this path.

Notes

[1] *Global Engagement: A Vision for the 21ˢᵗ Century* (Washington, D.C.: Government Printing Office, 1996), 7.
[2] Tom Breen, "Q&A: Air Force General Howell Estes, The Military's Top Space Official," *Space Business News* 15, no. 18 (September 3, 1997): 6.

Chapter 2

Culture

Vision without the wherewithal for change is called dreaming. '...or go Down in Flame?' Toward an Airpower Manifesto for the Twenty-First Century

—Richard Szafranski and Martin C. Libicki

Definition of Culture

Before discussing Air Force culture and how to change it, we must first understand what culture is. Culture is defined in many ways. Edgar Schein defines culture as the "accumulated shared learning of a given group, covering behavioral, emotional, and cognitive elements of the group members' total psychological functioning."[1] Ralph Kilmann describes culture as the "conclusions a group of people draws from its experience…what people believe about what works and what does not…ranging from conventional practices, to values, to assumptions. The real power of culture resides in the tacit assumptions that underlie it. These habitual ways of seeing and thinking about the world are like automatic pilots. They are powerful because people rarely think about them, though they influence almost everything people do."[2] He goes on to state culture is "the set of important assumptions (often unstated) that members of a community hold in common."[3] All three of these definitions imply some sort of cultural elements exist within groups. Critical elements of culture include observed behaviors when people

interact (language, customs, traditions, rituals), group norms, values, embedded skills, and habits of thinking.[4]   Other elements include organization structure, goals, charters, mission statements, myths, legends, stories, budget, published recruiting handbooks, and training.[5]   Organizational stories, rituals, language, and symbols are the most observable as they publicly represent the values of the group.[6]   For the purpose of this paper, culture is defined as a common set of assumptions, practices, and way of seeing and thinking.

Development of Culture

One must understand how culture develops before setting about changing it. Figure 1 shows how noted author Michael Ward depicts culture development. Once a behavior gets a result, that result is reinforced and expected in future situations. This leads to an attitude about what the correct behavior is. This continuous process is what defines a culture.   Within this process, there are mechanisms, which embed behavior, and mechanisms, which reinforce behavior.
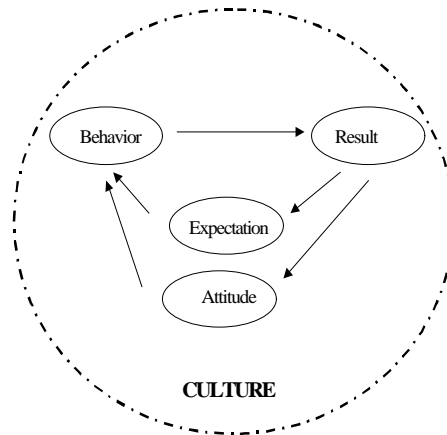
Source: Michael Ward, *Why Your Corporate Culture Change Isn't Working…and What to Do About It* Brookfield, V.T.: Gower Publishing Limited, 1994, 7.

Figure 1. Culture Development

The primary embedding mechanisms of culture are defined by Schein as:[7]

- What leaders pay attention to, measure, and control on a regular basis
- How leaders react to critical incidents and organizational crises
- Observed criteria by which leaders allocate scarce resources
- Deliberate role modeling, teaching, and coaching
- Observed criteria by which leaders allocate rewards and status
- Observed criteria by which leaders recruit, select, promote, retire, and excommunicate organizational members

Schein then defines the secondary reinforcement mechanisms as:[8]

- Organization design and structure
- Organizational systems and procedures
- Organizational rites and rituals
- Design of physical space, facades, and buildings
- Stories, legends, and myths about people and events
- Formal statements of organizational philosophy, values, and creed

Culture exists in all organizations, though organizations may be at different stages of growth. The function of culture is then different within each stage, as is the mechanism to change the culture.

Stages of Culture

Ralph Kilmann, in his book *Gaining Control of the Corporate Culture*, states there are three stages of culture as shown in Table 1. The Air Force is predominantly in the organizational mid-life stage. It has spawned many subcultures such as fighter pilots, tanker pilots, navigators, missileers, and space operators. Knowing this, we see on the chart that the way to change the culture is through planned organizational change and development, possibly through technological seduction. That is where the Air Force is today. Looking ahead at the third stage, organizational maturity, we must not allow culture to become a constraint on innovation. This could cause the destruction of the Air

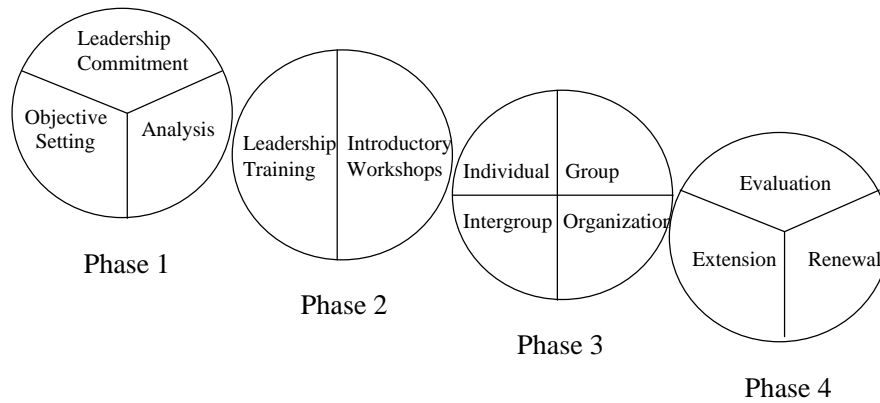Force or the birth of a separate Space Force, neither of which are part of the current Air Force vision.

Table 1. Growth Stages, Functions of Culture, and Mechanisms of Change

Growth Stage	Function of Culture	Mechanism of Change
1. Birth and Early Growth	Culture is the source of identity; the glue that holds the group together	Natural evolution or managed revolution through outsiders
2. Organizational Mid-life	Cultural integration declines as new subcultures are spawned; identity crises; loss of key goals, values, and assumptions	Planned change and organizational development; technological seduction
3. Organizational Maturity	Culture becomes a constraint on innovation; preserves glories of the past	Coercive persuasion; reorganization; destruction and rebirth

Source: Ralph H. Kilmann et al, *Gaining Control of the Corporate Culture* (San Francisco, C.A.: Jossey-Bass Publishers, 1986) 28-29.

Changes to Culture

Kilmann describes four phases to change culture as pictured in Figure 2. In phase 1, Analysis and Objective Setting, the organization analyzes the current culture, identifies key influences on the culture, and sets objectives for our desired culture. This phase sets a plan for action, enlisting the support of organizational leaders showing a public commitment for change. Key influences on culture include: formal documents, manuals, and organizational statements; rewards; information and communication systems; interactions and relationships; management and supervisory skills; organizational structures, policies, and procedures; training and orientation; and, allocation of resources. At the end of phase 1, the organization determines what is happening in the organization now, what it wants to happen, and what it needs to do to bring about this change.[9]

Phase 1: Leadership Commitment, Objective Setting, Analysis

Phase 2: Leadership Training, Introductory Workshops

Phase 3: Individual, Group, Intergroup, Organization

Phase 4: Evaluation, Extension, Renewal

Source: Ralph H. Kilmann , et al. *Gaining Control of the Corporate Culture*. San Francisco, C.A.: Jossey-Bass Publishers, 1986, 337

Figure 2. The Normative Systems Change Process

Phase 2, Systems Introduction and Involvement, gives people the opportunity to gain an understanding of the importance of the program, the impact of cultural norms on themselves and the organization, and the possibilities for change. This understanding can be accomplished through leadership training and introductory workshops. The key influences listed in phase 1 must be modified to support the objectives of the change process. At the end of phase 2, participants should ask themselves what they could do as individuals, as part of a group, and as part of an organization to aid in the cultural change process.[10]

Phase 3, Systems Implementation and Change, allows the individuals to implement the change in their group and organization. Leadership is important in this phase to help practice and reinforce the changes. Each person develops skills and understandings to achieve the change. Constructive feedback and support are provided by leadership.

Organizational policies, procedures and programs are modified to support the new goals.[11]

Phase 4, Evaluation and Renewal, is a continuous process so that the change gradually becomes part of the culture. During this phase, leaders recognize achievements, identify areas for improvement, plan further improvements, integrate new people into the process, and focus on results.[12] Remember, any culture must be customer oriented to survive. Customers must be satisfied with product reliability, quality, price-performance ratio, application, and service.[13]

Having laid a common framework by presenting definitions of culture, culture development, the stages of culture, and culture change, the next two chapters will discuss early air culture and Air Force culture today. We will come back to this common framework when discussing how to transition culturally to an air and space force.

Notes

[1] Edgar H. Schein, *Organizational Culture and Leadership* (San Francisco, C.A.: Jossey-Bass Publishing, 1992), 10.
[2] Kilmann, Ralph H. et al., *Gaining Control of the Corporate Culture* (San Francisco, C.A.: Jossey-Bass Publishing, 1986), 267-268.
[3] Ibid., 235.
[4] Schein, 8-9.
[5] Ibid., 180-184.
[6] Patrick E. Conner and Linda K. Lake, *Managing Organizational Chang,* 2nd ed. (Westport, C.T.: Praeger Publishers, 1994), 172.
[7] Schein, 231.
[8] Ibid.
[9] Kilmann, 339-346.
[10] Ibid.
[11] Ibid.
[12] Ibid.
[13] Ibid., 140.

Chapter 3

Early Air Culture

A very knowledgeable reporter stated recently that in the early 1950's he felt he knew what the Air Force stood for, but today he doesn't.

—General Curtis E. LeMay, CSAF, 21 Sep 61
Address to Air Force Association Convention, Philadelphia, Pa.

Sound familiar? We hear the above over and over again in today's Air Force. But it is not unique to the 1990s. Let's take a look at early air culture to see how it developed. During the early 1900s, the Army was at the growth stage between organizational mid-life and organizational maturity. The technological seduction of flying machines was coming into reality, spawning a new subculture of airmen. Some of the key elements in this early air culture include technology, mission statements, doctrine, resources, and leadership.

Technology

Looking back in history, one can see early air culture develop. This culture started with the technology of manned flight. And although the use of the flying machine was not immediately realized, in less than fifty years it had proven itself instrumental in war fighting. Writing two letters to the United States War Department in 1905, Orville Wright attempted to sell this new technology. "The series of aeronautical experiments upon which we have been engaged for the past five years," Orville Wright wrote on 18

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January 1905, "have ended in the production of a flying machine of a type fitted for practical use….The numerous flights…have made it quite certain that flying has been brought to a point where it can be made of great practical use in various ways, one of which is that of scouting and carrying messages in time of war."[1] On 15 June 1907, Orville Wright wrote: "We believe that the principal use of a flyer at present is for military purposes; that the demand in commerce will not be great for some time."[2] Orville Wright, without any 'Army' culture bias, could visualize a military use for airplanes, whereas the Army leadership could not.

Selling the airplane to the War Department was not an easy task. In a 10 October 1907 letter to the Board of Ordnance and Fortification which was reopening negotiations with the Wright brothers, then Army Chief Signal Officer, Brigadier General James Allen writes: "The military use of a flying machine of any type will be only for purposes of observation and reconnaissance, or, as an offensive weapon, to drop explosives on the enemy. For the purpose of dropping explosives on an enemy, a high speed aero-plane is hardly suitable….In passing over the enemy's works a flying machine should travel at least 4000 feet above the earth….Traveling at the rate of thirty miles an hour at this altitude, even after considerable practice it is not thought a projectile could be dropped nearer than half a mile from the target."[3] The 'ground pounder' culture had become a constraint on accepting new technology.

Without a vision, without doctrine, and especially without a concept of operations, it is quite hard to infuse new technology to meet the needs of the military. "The Signal Corps specifications for its first airplane did not include an operational requirement which it would be expected to satisfy. As a result, when the first Wright plane was

eventually accepted on 2 August 1909, the Army had a new item of experimental equipment which needed a mission."[4] "The offensive value of this thing has yet to be proved," argued Captain William Mitchell during hearings in the spring of 1913 before the House Military Affairs Committee. "It is being experimented with—bomb dropping and machines carrying guns…but there is nothing to it so far except in an experimental way."[5] Part of developing early air culture involved understanding how new technology fit into doctrine and operations.

Finally, during World War II, the airplane proved itself, spawning early air culture in the men of the Army Air Corps. In his book, *The Air Force Plans for Peace 1943-1945*, Smith describes the euphoria of the Air Force after the successful employment of the atomic bombs in WWII: "…The airplane was not considered just another weapon; it was the ultimate weapon for universal peacekeeping. Objectivity about this weapon was absent within Air Corps circles for many reasons. Perhaps the foremost reason was the psychological attachment of the airman to his machine. To him, the airplane was not just a new and exciting weapon; it was what carried him miles behind enemy lines and brought him back; it was a personal possession which was given a personal, usually feminine, name, kissed upon return from a mission, and painted with a symbol for each enemy plane shot down or bombing mission completed."[6]

Mission

As early air culture began to develop, this subculture within the Army began to question the assumptions currently held and propose new uses for aircraft. Speaking about the views toward military aviation, General Patrick, Chief of Air Service A.E.F., stated: "There are, on the one hand, enthusiasts who believe that the coming into being of

aircraft have practically scrapped all other combat agencies; and, on the other hand, conservatives who consider aircraft as merely auxiliaries to previously existing combat branches. The truth, of course, lies somewhere between those two views."[7]

In fact, Army culture had become a constraint on innovation as witnessed at the "Baker Board." On 18 July 1934, a special board known as the "Baker Board" was convened by order of the Secretary of War to make a constructive study on the operations of the Army Air Corps to determine the advisability of creating a Department of the Air.[8] Among the Board's findings were the following:

> The idea that aviation can replace any of the other elements of our armed forces is found, on analysis, to be erroneous. The lack of ability to invest or to capture and hold any position, the short period during which aircraft can operate before having to return to its bases, land or floating, the present impracticability of operations on a large scale except in at least fairly good weather, the necessity for protection by other forces except when in the air, and the problems of supply, including replacement of aircraft, are all limitations that should be kept in mind. The fleet, capable of self maintenance for protracted periods at sea, remains the only entirely dependable force for operations in that element. Since ground forces alone are capable of occupying territory, or with certainty, preventing occupation of our own territory, the Army with its own air forces remains the ultimate decisive factor in war.[9]

This constraint on airpower, the fact that "the Army primarily viewed the airplane much as it did an observation balloon—as an elevated viewing platform rather than as a weapon of war,"[10] was instrumental in the birth of the United States Air Force.

Doctrine

Air doctrine was developed in concert with aviation technology, and sometimes prior to the technology. Strategic bombardment doctrine was envisioned long before bombers and bombsights were developed. The Air Corps Tactical School was created in the 1920s and became the hub for doctrine development.[11] "Although it was officially an Army

establishment, it's ideas and teachings often strayed from official Army policy."[12] Besides developing doctrine, it also provided air training and air culture for an overwhelming percentage of future Air Corps leaders, including five Air Force Chiefs of Staff.[13] This significantly attributed to the development of the strong air culture in the Air Force.

Funding

Prioritizing resources was especially difficult during the years of reduced budgets. "Air Service funding was an additional source of friction between the Army and its aviators. The War Department had neglected its air arm prior to World War I. After the war, meager peacetime appropriations strained the entire Army. The General Staff was not about to further starve the Army's other combat branches so that the Air Service could buy new planes."[14] Prioritizing resources is one of the critical elements necessary to develop a particular culture. By not doing so, air culture within the Army was again constrained.

Leadership

Leaders have the most important role in developing culture. Subordinates pay attention to what leadership pays attention to. During the years of the Army Air Corps, the leadership did not pay attention to aviation, hence neither did the ground troops. In an interview on 23-25 April 1974, General Partridge related perceptions of aviators within the Army. Asked if there was any antagonism between the infantry, the cavalry, and the air or if people were anti-Air Corps in any sense, that they thought aviators were empire building or were doing something that really wasn't as vital, General Partridge

replied, "Some of them, yes. Very few Army officers took the trouble to find out about the Air Corps and how it could be used and so on. This was true right up to the Korean War."[15]   Another question asked was if General Partridge thought the Army was misunderstanding air power even then. He replied, "I didn't think they were paying much attention to us. We were sort of outcasts, a little bit. They pretended not to care, but they were jealous of the flying pay business. This was the bone of contention all through the years."[16] This attitude is indicative of leaders preserving the glories of the past and not looking to the future.

Another responsibility of leadership is to organize properly. This includes putting the right people in charge. "Airmen did not command flying units, infantry officers did. These commanders, though conscientious and capable, did little more than view the airplane as an extension of the Army's ability to fight the infantry, or the artillery, or the mechanized armor. They did not have the expertise, the vision, or incentive to view the airplane in any other way. To discern its awesome offensive striking power or its ability to be decisive in its own right was simply never considered."[17]   Until air culture was incorporated into the entire organization, air advocates should have held leadership positions.

Because of the constraints on early airpower innovation, the strong proponents of the air culture within the Army Air Corps suffered from a technology that was still in development, a mission of support, doctrinal challenges, resource prioritization challenges, and leadership that did not understand the air mission. These constraints eventually led to the creation of a separate service where airpower was embraced. The historical parallels of early air culture with today's Air Force culture are strikingly

similar. The next chapter will explain the similarities with the constraints on space culture development today.

Notes

[1] Cited in Robert Frank Futrell, *Ideas, Concepts, Doctrine: A History of Basic Thinking in the United States Air Force 1907-1964*. Vol. 1. (Maxwell AFB, AL: Aerospace Studies Institute, Air University, June 1991), 13.

[2] Cited in Futrell, 13.

[3] Cited in Futrell, 13-14.

[4] Futrell, 14.

[5] Cited in Futrell, 14.

[6] Perry McCoy Smith, *The Air Force Plans for Peace 1943-1945* (Baltimore: Johns Hopkins University Press, 1970), 18.

[7] Cited in Futrell, 39.

[8] Major G. R. Perara, *A Legislative History of Aviation in the United States and Abroad.* (in USAF Collection, AFHRA, March 1941), 57-58.

[9] Ibid.

[10] George H. Brett, "The AF Struggle for Independence," *Air Power History*, Fall 1996, 24.

[11] Griffin, Maj Dwight H., et al, *Air Corps Tactical School: The Untold Story,* Maxwell AFB, AL: Government Printing Office, May 1995, 4.

[12] Ibid., 5.

[13] Ibid., 7.

[14] Ibid., 24-25.

[15] Tom Sturm and Hugh N. Ahmann. USAF Oral History Interview. General Earle E. Partridge, 23-25 Apr 1974. Colorado Springs, C.O., (in USAF Collection, AFHRA), 43.

[16] Ibid., 68.

[17] Gen Howell M. Estes III, "Air Force at a Crossroad," Speech, Air Force Association, Los Angeles, Ca., 14 November 1997.

Chapter 4

Air Force Culture Today

Off we go, into the wild blue yonder; climbing high, into the sun; Here they come, zooming to meet our thunder; At' em boys, give her the gun; Down we dive, spouting our flame from under; Off with one hell of a roar; We live in fame, or go down in flame; nothing can stop the US Air Force!

—Captain Robert Crawford

Air Force culture today is easily identifiable: legendary stories of Billy Mitchell and Hap Arnold, flight suits and missions recreated using hand motions, movies like Twelve O'clock High, Thunderbird demonstrations and air shows, and the lyrics of the *Air Force Song* —off we go, into the wild blue yonder. It's hard to believe that General Hap Arnold had already envisioned a space mission when he ordered the first Scientific Advisory Board study in 1945.[1] The Air Force has been thinking about space since 1945, yet has no space legend stories, no satellite mission sorties or war stories, no space demonstrations, and no songs about space.

The Air Force's air and space culture is stalled because of the following: space technology is still evolving; the Air Force space missions are still undefined beyond force enhancement; space doctrine is really air doctrine; resource prioritization still favors air; and key leadership positions are occupied by rated officers.

Technology

Current unclassified space technology includes the force enhancement missions of communications, navigation, surveillance, and remote sensing. However, according to Major General (S) H. Marshal Ward, USAF/XOO, "The Air Force needs to look beyond using space as linkage—command and control, situational awareness, and communication links. The Air Force differs in that we have some core competencies that can naturally migrate to space; for example, air and space superiority: to ensure we protect our assets on orbit that we need—civil, military, and commercial,—and to deny enemy use of the space environment. As General Fogleman said, we need to be able to find, fix, target, track, engage any significant target on the earth."[2]

Space capabilities such as communication, navigation, weather, and reconnaissance were used successfully in the Persian Gulf War. And for the first time perhaps, the military is not leading the technology edge in space—commercial space technology is leading the way. According to Daniel Graham, in a *Defense News* article, "the necessity for military space capabilities is long acknowledged and dramatized by the Persian Gulf war. Furthermore, the link between the future of military and commercial space progress is now widely recognized to be at least as close as it was between military and commercial progress in aviation."[3]

Advances in critical technologies such as propulsion, optics, lasers, and harnessing of solar energy should be high priorities on the Air Force's research and development projects. Future space power depends on these advances to get us out of the communication and navigation business, which could easily be contracted out, and into the mission of space control.

Mission

The Air Force is still struggling today to define its space missions. As early as 1962, General LeMay discussed "beam-directed energy weapons that would transmit energy across space with the speed of light, thus effecting a technological disarmament of nuclear weapons."[4] And General Schreiver discussed military space weapon systems as having "the ability to orbit, maneuver, rendezvous, de-orbit, re-enter, and land on a routine basis…"[5] Comparing air power to space power, retired General Charles Horner, previous Commander in Chief, United States Space Command, said: "The Air Force finds itself in a predicament similar to that of the Army in the 1920s and 1930s, when the value of military air power was outpacing the Army's ability to realize it." He goes on to say: "Sometimes, I see the Air Force sticking its head in the sand like the Army did in the 1920s with regard to air power."[6]

Illustrative of Air Force and DOD indecision, General Joseph W. Ashy, then Commander in Chief, United States Space Command, discussed the future of space operations in an interview with Aviation Week. He said: "Some people don't want to hear this, and it sure isn't in vogue…but—absolutely—we're going to fight *in* space. We're going to fight *from* space and we're going to fight *into* space when [orbital assets] become so precious that it's in our national interest to do so."[7] The current Commander in Chief, United States Space Command, General Howell M. Estes III agrees. Speaking at the Air Force Association's annual symposium in Los Angeles on 18 October 1996, he stated: "It would appear to be an inevitable outcome that early in the next century, space systems will become as indispensable to our success as airpower….Similar to the eight decades of aircraft evolution, spacecraft are quickly evolving beyond the missions of

surveillance and communications….But just as the aircraft moved to control of the air and force application, so, too, will the missions of control of space and force application be increasingly important to us in the future."[8]

Doctrine

Space doctrine today leaves a lot to be desired. "According to the participants in the USAF Scientific Advisory Board's *New World Vistas: Air and Space Power for the 21*[st] *Century*, a research effort commissioned by the Secretary of the Air Force in November 1994, military doctrine for the use of space systems is at the same stage that aviation strategies and tactics were at the beginning of World War I. That means space is seen primarily as a medium for scouts or messengers —not warfighters."[9]

In an article in Space News, Kenneth Myers strongly suggests the Air Force is trying to update it's air doctrine by inserting the word 'aerospace' for 'air.' He writes: "The Air Force has a well understood, war-tested military doctrine for air power. The crux of the problem is Air Force insistence that the same doctrine applies to space. This is addressed in Air Force Manual 1-1 approved by McPeak. However, the manual does not withstand a single space doctrine reality check. The environment is different—there is no air in space. If we keep trying to build and fly satellites like airplanes, we will never be able to operate efficiently in space. The systems are also different, but the AF consistently assigns air officers to responsible space positions, organizing space units like air organizations, prioritizing space systems among unrelated aircraft development programs. The capabilities of space are different than air; and this is why the Air Force, as well as each of the other services, cannot possibly conceive how to effectively exploit the medium in its own doctrinal paradigm."[10]

One issue with space doctrine is the perception that space power violates the Outer Space Treaty and the Antiballistic Missile Treaty. These treaties prohibit nuclear, chemical, and biological weapons in space.[11] The legality of directed energy weapons in space, or weapons which cruise through space but do not reside in space must be addressed, but should not prevent the Air Force from moving forward.

Funding

The Air Force has yet to develop a long-term strategy with respect to prioritizing resources for future air and space assets. In an interview with Mr Brent Collins, PEO/Space in January 1998, he stated: "The DOD thinks space is a hobby to the Air Force. When push comes to shove, the Air Force is always going to decide to support F-22s, C-17s, the Joint Strike Fighter, and modernization of JSTARS and AWACS. You can't count on the Air Force to make the critical investments in space because they always have these other dibs on resources."[12] Carl Builder, in his book, *The Masks of War,* uses the personality of the Air Force to predict its behavior in future situations. He uses the Strategic Defense Initiative (Star Wars) program as an example of a space program that, once developed, would belong to one of the services. Looking at the Air Force, Builder states: "The Air Force is not about growth, power, or prestige in the abstract; it is about flying and flying machines. For the Air Force, there cannot be too much of flying and anything less than the very best flying machines that technology can provide. If the Star Wars program were assigned to the Air Force, the costs would have to be taken out of the Air Force's share of the defense budget."[13] Builder saw this as an example of the internal struggle the Air Force is having today with respect to prioritizing air and space resources.

Without a prevalent air and space culture, we need to heed the lessons of history to see "the situation resembles all too closely the attitudes of the services toward air power during the resource-pinched post-World War I period, when it took a Billy Mitchell, risking court-martial, to make the case for military air forces." [14]

Leadership

Leadership is the most critical element in the development of an organization's culture. Leaders must focus the organization on its values, or core competencies. It is troubling to know that "the foundation for Air Force space leadership was established before the Eisenhower era, at the close of the Second World War. At that time, the Army Air Forces took two important steps to set the stage for an Air Force future in space. With the publication of Toward New Horizons in late 1945, Commanding General of the Army Air Forces, Henry "Hap" Arnold and his close friend and Chairman of the Scientific Advisory Board, Theodore Von Karman, provided the service a sound research and development focus and an agenda for the future. Shortly thereafter, in early 1946, the service sponsored Rand Corporation issued its prescient report on satellite feasibility, *Preliminary Design of an Experimental World Circling Spaceship*, which predicted that an artificial Earth-observation satellite could be launched within five years…the newly designated USAF was determined to prevent the other services from capturing what it termed the 'space mission.'"[15] So for over 50 years, as long as the Air Force has been a separate service, it has been interested in the space mission.

In a speech on 15 April 1993, General Merrill A. McPeak, Chief of Staff USAF, highlighted the mental jump necessary by Air Force leadership to lead the Air Force to an air and space culture. He stated that: "Space is not yet fully appreciated even in the Air

Force. Today, we have many airmen who understand air operations, some people who understand space, but only a very few who comprehend the full sweep of military operations through the entire vertical dimension."[16] McPeak also said: "The introduction of new military capabilities often involves a rethinking, a mental jump to entirely new concepts. It is not a question of doing something better, but of doing something different. Not everyone can make this mental jump. One of our most insightful sayings goes, 'You can't teach an old dog new tricks.' As the physicist Max Planck sadly remarked of his own career, 'A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it.'"[17] This rethinking, or habit of thinking, is one of the key elements to change our service culture.

Having finally achieved an "air" culture since the early beginnings as the Army Air Corps, then the US Air Force, one can see the Air Force is now having difficulty transitioning to an 'air and space' culture. To enable this culture transition, Kinmann's change process, as discussed in Chapter 2, is applied to the current Air Force culture, and ideas are presented for a successful transition to an "air and space" culture.

Notes

[1] David N. Spires, *Beyond Horizons: A Half Century of Air Force Space Leadership* (Peterson AFB, C.O. , 1997), 271.
[2] Maj Gen (S) H. Marshal Ward, USAF/XOO, Pentagon, Washington D.C., interviewed by author, 9 January 1998.
[3] Daniel Graham, "Establish U.S. Space Force," *Defense News,* 12-18 September 1994, 34.
[4] Cited in Futrell, 432.
[5] Cited in Futrell, 433.
[6] Steven Watkins, "Is the Space Mission Too Big to Handle?" *Air Force Times,* 7 October 1996, 33.

Notes

[7] William B. Scott, "USSC prepares for Future Combat Mission in Space," *Aviation Week and Space Technology,* 5 August 1996, 51.

[8] Gen Howell M. Estes III, "Space: Fourth Medium of Military Operations,*" Defense Issues* 11, no. 98 (1996): 1,3.

[9] Peter Grier, "The Arena of Space," *Air Force Magazine,* September 1996, 44.

[10] Kenneth A. Myers, "Military Space Control Reality Check," *Space News,* 7-13 November 1994, 15.

[11] Lt Col Michael E. Baum, "Defiling the Altar: The Weaponization of Space," *Airpower Journal*, Spring 1994, 56.

[12] Brent R. Collins, PEO/Space, Pentagon, Washington D.C., interviewed by author, 10 January 1998.

[13] Carl H. Builder*, The Masks of War: American Military Styles in Strategy and Analysis* (Baltimore: The Johns Hopkins University Press, 1989), 199-200.

[14] Graham, 34.

[15] Spires, 271.

[16] Merrill A. McPeak, *Selected Works 1990-1994* (Maxwell AFB, AL: Air University Press, Aug 1995), 207.

[17] Ibid., 208.

Chapter 5

Creating an Air and Space Culture

Do not go where the path may lead; Go instead where there is not a path and leave a trail.

—Ralph Waldo Emerson

According to Michael Vickers in *Warfare in 2020: A Primer*, "Air power could be transformed by the increasing substitution of unmanned for manned systems….As it passes through this transformation, the Air Force will have to transcend the essence of its founding identity: manned flight. This will pose challenges not only to its core institutional culture, but also to its warrior ethos."[1] The functions of these unmanned systems will one day migrate to space.

Carl Builder, in his book, *The Masks of War*, observes that institutions have their own personalities, which govern much of their behavior.[2] When discussing the Air Force institution, Builder states that "the Air Force is, by far, the most attached of the services to toys. Air Force pilots often identify themselves with an airplane: 'I'm a 141 driver.' 'I flew Buffs.' 'I flew F-4Cs.' The pride of association is with a machine, even before the institution."[3] He goes on to stress: "The Air Force, conceived by the theorists of air power as an independent and decisive instrument of warfare, sees itself as the embodiment of an idea, a concept of warfare, a strategy made possible and sustained by

modern technology. The bond is not to an institution, but the love of flying machines and flight."[4]

According to Edgar Schein, "if an organization has had a long history of success with certain assumptions about itself and the environment, it is unlikely to want to challenge or reexamine those assumptions. Even if the assumptions are brought to consciousness, the members of the organization are likely to want to hold onto them because they justify the past and are the source of pride and self-esteem."[5]

Understanding this, the challenge is great to transition the Air Force culturally, too beyond the wild blue yonder. Remember, culture is a common set of assumptions, practices, and ways of seeing and thinking. Let's revisit the four phases of culture change and apply it to the transition from an air culture to an air and space culture. Also included are ideas from general officers interviewed during this research project.

Analysis and Objective Setting

The first phase, Analysis and Objective Setting, is the time to establish the common set of assumptions found in culture. To accomplish this, the Air Force must analyze what is happening now, what it wants to happen, and what it needs to do to make this happen. As pointed out in Chapter 4, what is happening in today's Air Force is a reluctance to prioritize space amongst air, with regards to technology development, mission assignment, doctrine development, resource allocation, and leadership/organization structure. This perception is best summed up by Major General Dickman, the DOD Space Architect: "I don't think the non-space Air Force sees the transition coming in their lifetime —not while they're doing their mission."[6] This means we do not have buy-in by today's Air Force personnel. What the Air Force leadership wants to happen, the Air

Force vision and core competencies, have been captured in the pamphlet *Global Engagement*: "We are now transitioning from an air force into an air and space force on an evolutionary path to a space and air force."[7]

Today's airmen must understand the overwhelming change taking place. As stated in the summary volume of *New World Vistas: Air and Space Power for the 21st Century*: "One should not doubt that the 21st century Air Force which will be enabled and, indeed, demanded by its new capabilities and responsibilities will hardly be similar to the Air Force of today. The changes will be as profound as those experienced by the Army in moving from horse to tank or by the Navy in converting from sail to steam."[8] The importance of this transition is echoed by Major General Dickman: "We need space to fight. If I can put weapons in space, say a space-based laser, then I could deny you the ability to fly an airplane…air power as we understand it today is irrelevant. Space is the high ground for us [the Air Force]."[9] Major General (S) Ward articulated this "need to understand the changing environment and the changing nature of war."[10] Space capabilities will play into this as the medium to conduct war. "We are decreasing our footprint…we are pulling away from forward deployments. In the future, we will need to launch from CONUS, do our mission, and get back again. This requires different technology, different CONOPs. We must be able to get up high enough to use orbits to get to our location quicker."[11]

And finally in phase 1, we set the course of events to be achieved in phases 2 and 3. We need leadership to make this cultural change happen, to transition to a common set of assumptions about our vision and core competencies. Air Force leadership must support the following: market the new vision and core competencies; organize the Air Force to

integrate air and space personnel; prioritize resources; develop a common language; develop skills in all airmen through training; and update Air Force doctrine.

Systems Introduction and Involvement

In phase 2, Systems Introduction and Involvement, we must increase ownership and initiate action. Each airman must understand what can be done as an individual, as part of a group, and as part of the Air Force organization. The four practices included in this phase are marketing the vision, restructuring the organization, prioritizing the resources, and establishing a common language.

Major General (S) Ward says HQ USAF is working on a Global Engagement briefing to market air and space power. All senior officers will be briefed, public affairs officers will brief the media, commanders will brief their units during commanders' calls, and the Chief of Staff of the Air Force will develop a video for the troops. This marketing campaign is meant to get the word out, not only on the Air Force's core competencies, but a roadmap of the missions transitioning to space, including when and how.[12] This is exactly what is needed to demonstrate the commitment of Air Force leadership to air and space power. Other ideas include depicting air and space power on Air Force recruiting materials, showing segments about space capabilities on the *Air Force News* show and *Air Force Now* films, announcing which spacecraft are within line of sight overhead at Air Force football games, and possibly taking pictures of flyovers with reconnaissance satellites and showing a picture of the flyover on the television right after it happens!

When discussing restructuring the organization, Major General Dickman says we need "space people in key non-space jobs. We are very willing to put air people in key

space jobs. We do it with CINCs, DOs, XPs, (with few exceptions), and the squadron level. Success is achieved when space is so integral to the rest of the business that we want space expertise in key positions."[13] Major General (S) Ward has a differing view. Rather than reorganize to put more space operators into the Air Staff, General Ward says we need to "integrate more 'space' into the Air Staff. That is, people *and* awareness. With only a 10% space population, you'd never get there. You need more people thinking about space."[14] The Air Staff is currently reorganizing to put more space people into key positions.

Major General (S) Ward discusses integrating Space Command, Air Combat Command, and Air Mobility Command to get rid of stovepipes as another way to organize. "Timing of integrating forces is critical. If it is too early, air will snuff out space. If it is too late, space will try to strong arm air and will break off into it's own force."[15]

Another practice to begin in phase 2 is prioritizing and committing resources to making space a viable tool in the war toolkit. As Major General Dickman stated: "The last time we committed to a fundamentally different capability in space was 1973 with the Global Positioning System…we consciously said there is something on the ground that we can do better from space and we will commit to doing that. We will probably do that with surveillance next….Due to fiscal constraints, new starts are unaffordable unless we pick something to phase in while phasing a current capability out. Keeping on this path, we can move more and more missions to space. Over time, we can afford it…the cynic would tell you we can't afford not to….Also, we need to focus our research and development where the long-term payoff would be. For an example, propulsion: How

can we get a 100% improvement vice a 15% improvement from today's propulsion systems."[16] Mr Brent Collins, PEO/Space, asks "are we willing to reduce the dollars we are investing right now in some of the aircraft systems and allow maybe even a drop off of performance in the near term in order to free up the assets to allow us to go do it [space functions] in the future? As the only superpower in the world today, we have a unique opportunity to retool for the future now."[17]

Major General (S) Ward also discussed a common language as a necessary practice. "The best way to build the bond and cohesiveness is to get today's warriors to become what we think our future will be. Space people need to understand today's warriors and be able to speak their language —ATOs, targets, the whole mindset of the business of today. You must understand today's problems to get to tomorrow's future."[18] Unfortunately, by doing things this way, Mr Brent Collins believes we are losing the Air Force space culture. "The pattern we're using is how do we do a space operations center so we can create space tasking orders just like air tasking orders, so space can be handled by the JFACC. I guarantee you that the AF vision is not to have a non-rated guy be the JFACC."[19] Space folks must understand today's warriors, but must have the freedom to do the right things with space culture, not make it conform to air culture.

Systems Implementation and Change

In phase 3, Systems Implementation and Change, individuals develop skills and an understanding of space power; Air Force doctrine is modified; and leadership must reinforce the transition and provide feedback. During this phase, "missions will evolve from supporting from space to operating in space."[20]

To develop skills and an understanding of space power, all airmen need air and space training. This training will reinforce the core competencies of the Air Force and how air and space play vital roles in achieving these competencies. Professional Military Education is vital in this area. Air University has developed a course, the "Air and Space Basic Course" to fill this void. This course needs to be taught to all new assessions, and at all Air Force leadership schools. Major General (S) Ward states: "We need to educate all Air Force people about aerospace power and it's role in joint warfighting and in maintaining regional stability throughout the world."[21] Another method of educating Air Force personnel on space power is "to educate warfighters about the availability of space products to enhance mission success"[22] so they know what to ask for during a contingency situation. This will force Air Force personnel to understand the capabilities their service brings to the fight. Major General Dickman seconded this idea, relating a story told by General Carnes: "During the propeller to jet transition, culture would never change by training one at a time. Jets were flown like propellers. Everyone then was jet qualified and returned to propellers. We need to do something like that in space. His suggestion is to set up a war scenario simulation. Starting at the top, working down through the wing commanders to the troops, let them fight their war. Then, do it again, bringing them the space resources available to them in the 2010 timeframe and let them see what happens differently. Let the pressure come from the other side [the users]."[23] Satisfying our warfighting customers is crucial for establishing a sustainable air and space culture.

And finally during this phase, Air Force doctrine should be updated to reflect our core competencies. According to Major General Dickman, space doctrine should be

updated by space operators. He says: "I can't help but wonder what air doctrine would've looked like if it had been done by infantry men at Fort Leavenworth, because that is what we're asking to have happen in space doctrine. We're asking airmen to develop space doctrine at Maxwell AFB…I'm not convinced we're doing much other than writing theory then trying to apply air power."[24] A team of space personnel commissioned to write space doctrine would alleviate the air culture bias we see in today's doctrine.

Evaluation and Renewal

In phase 4, Evaluation and Renewal, the Air Force must recognize achievements, identify areas for improvement, plan for further improvements, identify ripple effects of the change, and identify new possibilities and potential. Phase 4 should culminate in the Air Force having a common way of seeing and thinking.

Individuals and organizations must think about different, revolutionary ways to use space power. Major General Dickman asks: "How would I fly the airplane differently? Air to air combat beyond line of sight, with no visual confirmation. We can do that with information superiority while preventing fratricide…How about global surveillance... getting away from a theater focus, 1% of the world at a time…watch globally and put forces into one or two spots. This is far more useful from a national security standpoint."[25]

Mr Collins reminds us to look at which cultural end state we want to achieve. "Do we want to be a homogeneous or a compatible heterogeneous air and space force?"[26] A heterogeneous culture is seen today. One simple example is the lack of a one common "flight suit" uniform—pilots wear green flight suits, space personnel wear blue flight

suits, and the rest of the Air Force personnel wear the battle dress fatigues. This aspect alone is quite divisive. A common uniform with unit patches would eliminate the perception of air versus space. A common mission deserves a common look.

One step towards achieving a homogeneous air and space force, according to Major General (S) Ward, is to rename it the Aerospace Force. It would still be the USAF, but the "A" would signify "Aerospace" which does not distinguish between air and space but treats it as a continuum….The key is to develop a cohesive team where no one feels threatened internally, and to work together and focus all their energies on a common vision…global engagement is going to allow America's airmen to deliver the best aerospace forces across the full spectrum of conflict as defined by Joint Vision 2010."[27]

In an interview with Air Force magazine, General Estes was asked why the name of the Air Force was not changed when the emphasis was shifted to an air and space force. He replied the Air Force needs to first understand what it really means to emphasize space after 50 years of emphasizing air. He did say that "there will come a time, I think, when you may see the word 'space' in our title. And there may be a time when there is nothing but 'space' in our title."[28] If we successfully transition to an air and space culture, the name "Aerospace Force" will convey perfectly the mission of the Air Force.

Using the four phases of culture change, Air Force leadership can successfully guide the Air Force to an air and space force on the evolutionary path to a space and air force. This process is not an overnight process, but should not be a process that is only successful when a new generation of personnel take over the Air Force. If we wait that long, there may be no need for an Air Force, because the Space Force may make air power obsolete.

Notes

[1] Michael G Vickers, *Warfare in 2020: A Primer* (Center for Strategic & Budgetary Assessments, October 1996), 7.

[2] Builder, 3.

[3] Ibid., 23.

[4] Ibid., 32.

[5] Schein, 321.

[6] Maj Gen Robert Dickman, DOD Space Architect, Washington, D.C., interviewed by author, 9 January 1998.

[7] *Global Engagement: A Vision for the 21st Century*, 7.

[8] USAF Scientific Advisory Board, *New World Vistas: Air and Space Power for the 21st Century, Summary Volume* (Washington, D.C.: Government Printing Office, 15 December 1995), iv.

[9] Dickman interview.

[10] Ward interview.

[11] Ibid.

[12] Ibid.

[13] Ibid.

[14] Ward interview.

[15] Ibid.

[16] Ibid.

[17] Collins interview.

[18] Ibid.

[19] Collins interview.

[20] Gen Howell M. Estes III, "Sustaining the Strategic Space Advantage," *Defense Issues* 12, no. 5 (1997): 2.

[21] Ward interview.

[22] William B. Scott, "Major Cultural Change on Tap in Military Space," *Aviation Week and Space Technology*, 18 September 1995, 40.

[23] Dickman interview.

[24] Dickman interview.

[25] Ibid.

[26] Collins interview.

[27] Ibid.

[28] John A. Tirpak, "The Rise of Space," *Air Force Magazine,* August 1997, 55.

Chapter 6

Conclusion

*Victory smiles upon those who anticipate the changes in character of war,
not upon those who wait to adapt themselves after the changes occur.*

—Giulio Douhet

As Lieutenant General Jay W. Kelley said: "If there's one word that accurately characterizes today, it's *change*—and lots of it. Not a little bit—a lot. That's threatening to some, because they would say, 'Let's just hold on here; hang on, we'll get through this…Things will steady out, and then things will be okay.' That's not going to happen!"[1] In an interview with General Estes, Commander in Chief, United States Space Command, he echoed this comment by saying: "Those who want to preserve the status quo may think these possibilities [moving additional air missions to space] are negative, but they're positive. Every technological advancement that allows us to better accomplish our military missions benefits both the nation and the Air Force. Although our natural disposition is often to resist change, change is inevitable. We're on the right path for the Air Force and the nation."[2]

The Air Force is anticipating the changes in the character of war, and has stated it's space vision in *Global Engagement*: "We are now transitioning from an air force into an air and space force on an evolutionary path to a space and air force."[3] As an organization in it's mid-life, the Air Force has been seduced by space technology as a way to fight and

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win future wars. The challenge now is to seize the opportunity for change and transition the strong air culture within the service to an air and space culture. Leadership plays a vital role in overcoming resistance to this transition. History shows us that the visionaries prevail, whether within the cultural paradigm or outside of it.

Because early air power culture within the Army was constrained, culture change occurred through birth of a new organization, the United States Air Force. The Army culture inhibited innovation, so military use for the airplane could hardly be imagined, let alone funded amongst the other Army priorities. Early air culture was a unique identity that held the airminded group together.

Current Air Force culture is dominated by a strong air culture. A space culture is developing, but only within the few space organizations. Air Force leadership is working hard to promote an air and space force as a vision of the future, but has a long way to go to transition the Air Force culturally. Lagging technology, space doctrine, resource prioritization, and organization structure still hinder the transition to an air and space culture.

Culture has been defined as a common set of assumptions, practices, and way of seeing and thinking. For the Air Force to transition from an air culture to an air and space culture, key elements need to be addressed in each of the four phases of Kilmann's culture change process.[4] In phase 1, Analysis and Objective Setting, the Air Force needs to analyze what is happening today, what it wants to happen, and what needs to be done to make it happen. The most important outputs of this phase must be a common set of assumptions as stated in the Air Force's vision and core competencies and a long term plan to address other key elements necessary for phases 2 and 3 to continue. During

phase 2, Systems Introduction and Involvement, practices must be put into place. The Air Force will increase ownership and initiate action by marketing the vision, restructuring the organization, prioritizing the resources, and establishing a common language. These key elements must be initiated by leadership. Phase 3, Systems Implementation and Change, needs to follow up with air and space training and doctrine updates. This is the phase where all Air Force personnel will be involved. And finally, phase 4, Evaluation and Renewal, will culminate with a common way of seeing and thinking. The cultural change is evaluated and any course corrections are initiated. A culturally homogenous air and space force, on an evolutionary path to a space and air force, possibly the 'Aerospace Force,' will result.

By transitioning culturally to 'beyond the wild blue yonder,' the Air Force will successfully wield "global engagement through America's airmen delivering the best aerospace forces across the full spectrum of conflict."[5] An air and space culture today will lead us into a space and air culture throughout the next century.

Notes

[1] Lt Gen Jay W. Kelley, USAF. Space is More Than a Place. 10:97-102. *Airpower Journal* Summer 96. P97.
[2] Gen Howell M. Estes III, Commander United States Space Command, e-mail interview by author, 16 March 1998.
[3] *Global Engagement: A Vision for the 21st Century Air Force*, 7.
[4] Kilmann, 339-346.
[5] Ward interview.

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