SCHOOL OF ADVANCED AIRPOWER STUDIES

AIR FORCE CULTURE AND CONVENTIONAL STRATEGIC AIRPOWER

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ACKNOWLEDGEMENTS

I would like to acknowledge the help of my advisor, Colonel Phillip S. Meilinger, for his patience and guidance in this endeavor. I would also like to thank Majors Mark Gunzinger and Jason Barlow, and Lieutenant Colonel Steve McNamara for their enthusiasm and constructive criticism. Above all, I would like to thank Cathy Ford for her unwavering confidence in my ability to complete this project.

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ABSTRACT

The Air Force was founded upon the precepts of strategic bombing. Hugh Trenchard, Giulio Douhet, and Billy Mitchell pioneered early airpower doctrine while the Air Corps Tactical School refined and developed it to eventually form the blueprint for American bombing in World War Two. After the atomic bombings of Hiroshima and Nagasaki, nuclear strategic airpower stole the limelight from its conventional counterpart. The Air Force blossomed under the national strategy of Massive Retaliation because its long range heavy bombers were the preeminent delivery platform for nuclear weapons. Thus SAC's bomber pilots dominated the service to the point strategic airpower became synonymous with nuclear weapons while TAC operated in the shadows of Air Force respectability striving to maintain its legitimacy despite the ambiguous effects of strategic airpower in Korea. Technology and the impact of the Vietnam War started a shift in Air Force culture from bombers to fighters that has seen the pendulum swing to the other extreme where fighter pilots run the service at the expense of conventional strategic airpower. After Vietnam, the Air Force seemed preoccupied with the European theater and AirLand Battle doctrine that did not require conventional strategic airpower.

It is the contention of this author that a shift in culture from bombers to fighters has not changed the essence of airpower, but it has led to a decline in emphasis on conventional strategic operations. If there is a lesson to be learned from this shift it is the importance of understanding airpower and its applications. Desert Storm proved the essence of airpower has not changed, even bringing conventional strategic bombing into the spotlight. It should not matter who runs the Air Force as long as they understand the full potential of airpower—strategic as well as tactical.

CHAPTER 1

INTRODUCTION

The Air Force in its brief existence has absorbed tremendous changes to not only its aircraft and weapons but to its personnel as well. These changes have affected the way the Air Force thinks of itself as an institution, as well as the way its leaders perceive air power and its applications. One of the major changes that has occurred in the Air Force involves the move from a service dominated by bomber pilots to one dominated by fighter pilots. This cultural shift in turn has affected the way the Air Force views conventional strategic airpower. The purpose of this paper is to determine if a shift in Air Force culture has occurred and if so, why did it happen and what is the impact on conventional strategic airpower. It is the contention of this author that a shift from bombers to fighters has not changed the essence of airpower, but it has led to a decline in emphasis on conventional strategic operations. In order to thoroughly examine the question of Air Force culture and conventional strategic airpower, some definitions are necessary.

Air Force Culture

Webster's New World Dictionary, second college edition, defines culture as: "the ideas, customs, skills, arts, etc. of a given people in a given period; civilization." Using this definition as a guide, it is easy to see how the Air Force and the other services have their own distinct culture. To examine Air Force culture more closely, it is necessary to look at indicators that illuminate or provide insight into the very nature of the Air Force and its operations. Three major indicators will be examined: 1) leadership, 2) force structure, and 3) doctrine. Other indicators that could provide insight include sociology—below-the-zone promotion rates by major command, and long range goals—where the Air Force is headed. Perhaps some future study could examine these and other issues.

Air Force Leadership

Two areas of Air Force leadership will be investigated. First, high ranking air staff positions will be examined to determine the operational backgrounds of these individuals. This will provide insight into their orientation—bomber, fighter, airlift, or non-rated. Next, the commanders of the major commands will be reviewed for the same information.

Force Structure

When looking at the force structure it is necessary to determine how the service is organized. This includes aircraft in the Air Force inventory, personnel in the major commands, and operating budgets. This will provide insight into the values, ideas, and beliefs (culture) of the Air Force at a given time.

Doctrine

Basic Air Force doctrine has remained relatively unchanged over the past seven decades. Small, incremental changes have occurred but nothing to challenge the core that evolved from the 1920s. What has changed, however, is Air Force emphasis on different aspects of doctrine for a given period of time. With this idea in mind, it is possible to gain insight into how the Air Force effected changes in acquisition, organization and employment of air assets.

The Essence of Airpower

The roles of airspace control, force application, force enhancement, and force support appear to pump the very heart of Air Force existence.[1] Their strategic application, especially, paved the way for achieving independent and coequal status with the sister services rather than supporting them. To be sure, there were other factors at work in gaining independence, thus the basic roles should not be construed as guaranteeing Air Force sovereignty but rather snowballing the momentum.

Airspace control is primarily counterair (offensive and defensive) missions.[2] Force

application translates into ordnance on target using missions such as strategic bombardment, interdiction, and close air support.[3] Inherent within this role is the principle of employing the airframe (regardless of its reputation as a strategic or tactical asset) best able to accomplish target objectives. Aircraft should not be labeled for one particular mission only. Long range heavy bombers should not be limited to strategic missions only; likewise, fighters can perform tactical, operational, and strategic sorties. Force enhancement multiplies combat effectiveness by airlift, air refueling, reconnaissance, and other means.[4] Finally, force support sustains forces by defending installations, and supporting them logistically, as in the case of channel airlift.[5]

Conventional Strategic Airpower

The new Air Force Manual l-l provides an excellent description of strategic airpower and its aims:

> Strategic attacks should produce effects well beyond the proportion of effort expended in their execution. Strategic attacks are carried out against an enemy's centers of gravity including command elements, war production assets, and supporting infrastructure (for example, energy, transportation, and communication assets). Strategic attacks should be designed to be persistent and coordinated so as to affect the enemy's capability and possibly his will to wage war. Thus, strategic attacks should affect the entire war effort rather than just a single campaign or a single battle.
>
> Strategic attacks are defined by the objective—not by the weapon system employed, munition used, or target location. Strategic attacks (whether conventional or nuclear) can make vital and at times decisive contributions in gaining a war's objectives.[6]

An outstanding example of conventional strategic airpower occurred recently in the Gulf War. F-117s performed surgical strategic bombing missions in and around Baghdad while F-15Es hunted SCUD missiles in the Iraqi desert. These were instances where the objective, not the weapon system, defined the role of airpower. In addition to inflicting serious physical damage to the enemy, the effects of strategic bombing also had a major psychological impact on the Iraqi army that was unable to defend itself against these attacks.

From the above discussion springs a foundation for eventually illuminating the relationship between Air Force culture and conventional strategic bombing. By discussing the essence of airpower one can better determine if a shift in culture really makes a difference in the application of airpower. The next step in gaining further insight into these positions is to examine the relationship between the Air Force and long range heavy bombers.

CHAPTER 2

THE AIR FORCE AND LONG RANGE HEAVY BOMBERS

The influences that created the Air Force of the 1950s came from within the aviation community itself (Army Air Corps and Air Force) and outside aviation circles (national strategy such as Massive Retaliation and technology such as nuclear weapons). These combined influences were what made SAC so predominant throughout the 1950s. A brief historical review is necessary to explain this remarkable achievement by SAC.

Early Airpower Doctrine

Foremost among the pioneers of airpower theory are Hugh Trenchard, Giulio Douhet, and William Mitchell. Although the impact of their thinking is still felt today their influence was greatest on early Air Force leaders because the long range heavy bomber reigned supreme. During the 1940s and 1950s the bomber was generally considered by Air Force and national leaders to be the decisive instrument of war.

Trenchard

Air Marshal Viscount Hugh Trenchard was the first Marshal of the Royal Air Force (RAF) and the "father" of British airpower.7 Some of his early reflections on the theory of airpower after the Great War were recorded in an article he wrote in 1921 for The Army Quarterly in which he discussed some principles of airpower such as centralized control, predominance in the air, and the need to coordinate strategic bombing with land and sea forces.[8] Trenchard believed in the indivisibility of airpower; it was not to be divided into "separate bodies" to perform only one specific role because aircraft could conduct a variety of missions to fully exploit the unique characteristics of airpower.[9] He was confident at this time that "the aeroplane is not a defence against the aeroplane," and a determined enemy could get through because the sky was simply too large to defend.[10] Trenchard believed in the offensive more than

defensive nature of airpower because air forces had to gain and maintain command of the air.[11] His influence on American airpower theory was evident through his relationship with Billy Mitchell, exchanging ideas during the Great War and afterward when Mitchell visited Trenchard to study RAF force structure and organization.[12] Trenchard's principles are timeless and are found in air campaigns conducted today. At the opposite end of the recognition spectrum was the little known Italian Giulio Douhet.

Giulio Douhet

Giulio Douhet (1869-1930) was an Italian soldier and author of The Command of the Air who put together probably the "most coherent, the most systematic, and the most prophetic airpower writing" of his era.[13] Douhet believed aerial warfare had become the decisive form of war because victory could be attained by striking "blows to the morale of the civilian population.[14] He abhorred the trench warfare of World War One and saw airpower as the means to avoid the trenches in the future and strike at the heart of the enemy. With the advent of airpower, total wars (Douhet assumed future wars would be total) would never be the same. Those who seized the advantage of the air medium in warfare were destined to be victorious while all others were doomed to eventual failure.

First and foremost, Douhet's theory of airpower stressed the offensive over the defensive. Douhet did not believe in air defense, stating the need for "destroying the source of aerial power at its point of origin. The surest and most effective way of achieving this end is to destroy the enemy air force at its bases, which are found on the surface."[15] The primary instrument of air warfare was the long range heavy bomber that he called the "battleplane."[16] This aircraft "should have the radius of action, speed, and armor protection [equal to that of combat planes or air to air fighters] but should have armament sufficient both for aerial combat and for offensives against the surface."[17] Waves of battleplanes would then fly behind enemy lines and win command of

the air that would "prevent the enemy from flying while retaining the ability to fly oneself."[18] Command of the air could then be exploited by "crushing the material and moral resistance of the enemy."[19] Despite his controversial theory Douhet had some influence on early airpower thinking in the US, meeting with Mitchell several times in the early 1920s and exchanging ideas on strategic bombing.

Billy Mitchell

Mitchell's influence on early US airpower doctrine began to take shape in World War One. In 1917 he wrote a doctrinal paper "General Principles Underlying the Use of the Air Service in the Zone of Advance A.E.F" that outlined his views on the tactical and strategic application of airpower.[20] He divided aviation into three missions: observation, pursuit, and bombardment (tactical and strategic).[21] Tactical applications of airpower were emphasized over strategic because Mitchell saw the destruction of the enemy on the battlefield as the means to ending the war.

In 1921, (the same year Douhet published his book) Mitchell published Our Air Force. In it he covered various topics such as the characteristics and applications of airpower, the branches of aviation and their use in war, and the future of aviation. Mitchell believed that in future wars battles would be fought for control of the air. Mitchell agreed with Douhet on exploiting air supremacy when he wrote: "A determined enemy, in the future, that gains control of the air will use every means to subjugate the hostile countries. "[22] Mitchell discussed doctrine as follows: "Our doctrine of aviation, therefore, should be to find out where the hostile air force is, to concentrate on that point with our Pursuit, Attack, and Bombardment Aviation, to obtain a decision over the hostile air force, and then to attack the enemy's armies on land or navies on the water, and obtain a decision over them."[23] Note that once command of the air is achieved that Mitchell goes after the enemy's forces while Douhet goes after the physical and moral resistance

of the civilian population. Mitchell saw pursuit as the dominant branch of aviation followed by bombardment, attack, and observation aviation. Bombers must be escorted by pursuit aircraft if they were to be effective at the target area. This was a lesson Mitchell learned from the Great War as well as the need for an independent air force.

Because Mitchell saw airpower dominating wars of the future, he felt that airpower should be organized into three units—air force, local air defense units, and auxiliary air units—which combined would be on a coequal status with the Army and Navy.[24] This organization would be centrally controlled to prevent the "piece-meal application of air power and the inability to develop the maximum force at the critical point."[25] Needless to say, his beliefs generated much friction with the Army and Navy.

Mitchell challenged the need for the Navy to continue its mission of coastal defense. He saw battleships as being particularly vulnerable to airpower and submarines, and thus it was only a matter of time before they would be eliminated.[26] Mitchell conducted experiments (June-July 1921) to prove his ideas on the superiority of airpower over battleships, the most famous of which resulted in Martin bombers sinking the battleship Ostfriesland.[27] This went far to confirm the Navy's budding belief in the huge potential for naval airpower (aircraft carriers). Mitchell saw the battleship experiments and his eventual court-martial as vehicles for advocating airpower and its applications.

Like Douhet, Mitchell believed that airpower would alleviate the carnage of World War One. However, where Douhet believed in "battleplanes" escorting each other, Mitchell believed in pursuit aircraft escorting bombers until control of the air was achieved. Like Douhet and Trenchard, Mitchell had a strong influence on US early airpower thinking.

Billy Mitchell's impact on airpower doctrine has earned him status as one of the founding

fathers of the US Air Force. The Air Corps Tactical School consistently used his bombardment manual as a reference for instruction. By 1926, Mitchell was writing about using air power to strike at the enemy's "will to resist."[28] This "is accomplished only by reaching the enemy nation's vital centers, paralyzing them and making it impossible for the population to carry on in war or to live in peace."[29] The idea of vital centers helped create momentum for the daylight precision bombing doctrine eventually developed at the Tactical School. Mitchell's propositions served as the foundation for airpower theory that eventually formed Air Force doctrine.[30] Surprisingly, there does not appear to be any evidence of Mitchell maintaining a close relationship with the Air Corps Tactical School.[31] However, Mitchell was personal friends with Carl A. Spaatz, Frank M. Andrews, Henry H. Arnold, and Harold L. George—men who were destined for leadership positions in World War Two.

Institutional Bias for Heavy Bombers

The Air Corps Tactical School used the airpower theories of Trenchard, Douhet, and especially Mitchell to develop the doctrine of precision daylight bombing. The question of escorting the bombers with pursuit aircraft was answered with the superior bomber technology available at the time. Thus, a vision of Douhet's unescorted battleplane, capable of defending itself, came into existence with the advent of the B-17.

Air Corps Tactical School

The small group of men that comprised the Air Corps Tactical School (ACTS) strongly desired to translate the theories of Trenchard, Douhet, and Mitchell into doctrine that had practical applications. The ACTS at the time (1920s and 1930s) was the only group in the Army exploring airpower in terms of evaluating ideas and developing doctrine. The men at the ACTS realized the importance of the role of airpower supporting the ground and naval forces, but were firm in their belief of broader applications. Debates about airpower at the ACTS were often

rigorous and heated.

> The fighter versus bomber controversy was a hot one at the Air Corps Tactical School, which became the center of doctrinal development. Bomber survivability was crucial to the whole concept of air power, for unless the proponents of air power could count on bombers getting sufficient bombs "on target," without incurring losses that were too high to permit sustained operations, the whole idea was little more than an exercise in futility."[32]

The men involved in this debate were passionate and intense in their beliefs and also obstinate. The fighter camp was led by Claire Chennault of the Pursuit Section while the bomber camp was represented by Ken Walker and Harold George of the Bombardment Section. Chennault "considered the tactical offensive operations of pursuit to be the basic purpose of the air arm."[33] Fighters would protect the homeland and establish air superiority over the friendly surface forces. He believed that bombers could not survive against fighters, nor was he interested in using fighters to escort bombers. Chennault believed "pursuit which was tied to the escort role lost the initiative, and eventually the combat."[34] George and Walker countered with the belief that "bombardment was the real offensive element of the air force, and hence it was the basic air arm."[35] They felt that even if pursuit could achieve air superiority, it could do little to exploit the advantage. The strategic bombers comprised the aviation branch that could best affect the course of the war.[36] The controversy raged until Chennault left the ACTS.

> The fighter versus bomber controversy largely remained a moot issue after Chennault left the Air Corps Tactical School. It was recognized that fighter escort was inherently desirable, but no one could quite conceive how a small fighter could have the range of the bomber yet retain its combat maneuverability. Failure to see this issue through proved one of the Air Corps Tactical School's major shortcomings.[37]

Thus, the ACTS found itself with an airpower doctrine that emphasized destruction of enemy "war-making capacity" through strategic precision daylight bombing which would "cripple either his war machine or his will to continue the conflict. "[38]

The ACTS was an institution within the institution of the Army. Because the Army Air

Corps had no official doctrine in the early 1930s, ACTS teachings were considered as doctrine and guidance for air planning by airmen. These teachings were in direct conflict with official Army doctrine which viewed aviation as strictly supporting surface forces. Board after board met during the 1920s and early 1930s to evaluate and determine the role of aviation with respect to the military and nation.[39] Each time the Army view prevailed, with airpower officially recognized as primarily supporting surface forces. The fact that the ACTS was able to keep their airpower doctrine—strategic precision daylight bombing—alive in the face of conflicting War Department doctrine represented a remarkable achievement. Another factor that helped keep ACTS airpower doctrine alive was technology.

Technology and Heavy Bombers

Technology turned the tide in favor of the bomber advocates regarding the bomber versus fighter controversy.

> Initially, George and Walker were hard pressed to handle the arguments of Chennault, the Chief of the pursuit section, for they were forced to talk initially in terms of the cumbersome, ill-armed bombers of the early 1930s, planes with a top speed of about 110 miles per hour. Their ceiling, bomb load, and defensive firepower were also sadly limited. Chennault argued, and World War I experience tended to back him up, that such aircraft were too vulnerable to carry out a successful bombing campaign, in the face of pursuit opposition.[40]

This changed with the development of the B-9, B-10, B-12, and other long range heavy bombers. These aircraft were state of the art, fast with single wings, stressed skin construction, and retractable landing gear; thus they gave bombers an advantage over fighters unheard of in World War I.[41] With the Air Corps encouraging the aircraft industry, larger, faster bombers were being developed on a regular basis. Flight tests were conducted at March Field, California, in 1934 pitting B-12 bombers with the latest model P-26 pursuit aircraft. Both aircraft had nearly identical speed and led to the conclusion that pursuit aircraft would not be able to intercept bombers except by pure accident.[42]

Curiously enough, the same aircraft industry was not encouraged to develop new and better fighters along with the bombers. The state of technology favored bombers as much if not more than pursuit, which only fueled Air Corps' preoccupation with the former as the means to execute its doctrine. The strategic requirements of the Red-Orange war plans also encouraged emphasis on long range bombers because of the vast expanse of the Atlantic and Pacific oceans to negotiate in the event of war with Great Britain or Japan.[43] Any hope for an autonomous air force lay with long range bombers capable of independent, offensive operations and not pursuit aircraft which were projected in either a defensive or auxiliary role for the Army. As a result there was an institutional bias within ACTS and Air Corps for bombers over fighters or pursuit aircraft.

Heavy Bombers and World War Two

Going into World War Two the Air Corps still did not have official recognition for its airpower doctrine. In 1939 the War Department stated: "The mission of the air component of the Army is to perform effectively the air operations devolving upon the Army in its assigned functions in the national defense. ...Air operations beyond the sphere of action of the surface forces are undertaken in furtherance of the strategic plan of the commander of the field force."[44] Thus, ACTS teachings and textbooks were used as Air Corps doctrine.[45] This all changed as a result of events in Europe which accelerated the creation of the Army Air Forces in June 1941. Then in July, only two weeks after the German invasion of Russia, President Roosevelt asked the Secretaries of War and the Navy for the production requirements that would defeat "our potential enemies."[46] This led to the famous Air War Plans Division 1 (AWPD-1) and AWPD-42 airpower documents.

AWPD-l and AWPD-42

The purpose of AWPD-l was to respond to Roosevelt's question regarding production

requirements necessary to defeat potential enemies. It was to become Annex 2, Air Requirements, of the War Department report, also known as the "Victory Program." This strategic air plan had to follow the guidelines already spelled out in the American-British Conversations (ABC- 1) and the Rainbow No.5 US war plan, which called for joint US, British, and French action to defeat Germany, Italy, or both.[47] ABC-l called for strategic offensive actions in Europe while maintaining strategic defensive operations in the Far East. This guidance proved useful in developing the objectives of AWPD-1.

The overall objectives of AWPD-l were expressed as follows:

> a. To wage a sustained air offensive against German military power, supplemented by air offensives against other regions under enemy control which contribute toward that power (ABC-1).
>
> b. To support a final offensive, if it becomes necessary to invade the Continent.
>
> c. In addition, to conduct effective air operations in connection with hemisphere defense and a strategic defensive in the Far East.
>
> d. The basic concept on which this plan is based lies in the application of air power for the breakdown of the industrial and economic structure of Germany. This conception involves the selection of a system of objectives vital to the continued German war effort and to the means of livelihood of the German people, and <u>tenaciously concentrating all bombing</u> [italics in original] toward the destruction of the objectives. The most effective manner of conducting such a decisive offensive is by the destruction of precise objectives, at least initially. As German morale begins to crack, area bombing of civil concentrations may be effective.
>
> e. It is improbable that a land invasion can be carried out against Germany proper within the next three years. If the air offensive is successful, a land offensive may not be necessary.[48]

To accomplish the above objectives, the air plan called for the destruction of the following targets:

German Air Force	18	airplane assembly plants
	6	aluminum plants
	6	magnesium plants
Electric power	50	generating plants and switching systems
Transportation	47	marshaling yards, bridges, and locks
Synthetic petroleum	27	synthetic plants
Total	154	targets [49]

Attacking these targets using rigid criteria required a force of some 61,800 aircraft and 2,165,000 (180,000 officers and 1,985,000 enlisted personnel) men and women representing a 42-fold increase in personnel.[50] The air plan tactfully included support for an invasion (if necessary) of the continent as well as independent, offensive strategic bombing operations.

The importance of AWPD-l cannot be overemphasized. The document went beyond the traditional scope of employing airpower in support of surface forces and into the realm of independent strategic operations. It marked the "apex of prewar air force doctrinal thought" and a blueprint for Army Air Forces organization and operations during the war.[51] AWPD-l was the vehicle for long range bomber advocates to legitimize their doctrine with top US civilian and military leadership. The President's approval helped clear the path for the Army Air Forces eventually gaining greater autonomy in air operations.[52] AWPD-42 was simply an embellishment and update of AWPD-1. The plan outlined aircraft requirements for the Allies in addition to the US. AWPD-l had been a "contingency plan," whereas AWPD-42 was a "requirements" plan detailing physical infrastructure and equipment needed to execute the air war.[53] AWPD-42 also looked at targets in Japan and proposed the same targets as found in Germany with the exception of the electric power system and transportation. [54] Total aircraft approved for production was

127,000 with 85,300 going to the Army Air Forces, and the rest going to the Navy and US allies.[55] AWPD-42 sustained the momentum for using American airpower in a strategic offensive against Germany. The Casablanca Directive gave even further credence to American strategic airpower.

The Casablanca Directive

Army Air Forces began strategic bombing rather unevenly against occupied Europe from Egyptian and English bases during the summer of 1942. There was tension between Army Air Forces (especially General Arnold) leaders and theater commanders over whether the bombers would conduct independent or auxiliary operations.[56] Many bombers were diverted from Eighth Bomber Command, led by General Ira Eaker, to North Africa in support of Operation Torch, reducing the number of bombers available for independent employment. Shipping losses from the German U-boat campaign were taking a toll on replacement air crews and aircraft.[57] By early 1943 it was apparent strategic bombing operations were disappointing for the reasons mentioned above as well as the lack of a formally approved strategic air plan by the Combined Chiefs of Staff (CCS).[58]

Perhaps the most controversial strategic air guidance of the war came from the Casablanca Conference in January 1943. By this time it was apparent that there was insufficient time to undertake a strategic bombing offensive of sufficient scale to bring about the defeat of Germany through airpower alone.[59] However, both President Roosevelt and Prime Minister Churchill, along with the CCS, agreed on the need for a strategic bombing offensive to support the eventual land invasion—the question was how to conduct the offensive. Churchill and the RAF Bomber Command believed in night bombing attacks against area targets because of unacceptable attrition rates from daylight operations.[60] The Army Air Forces believed precision daylight bombing was the best air doctrine for defeating Germany even if a ground invasion was

necessary. A compromise was reached calling for a Combined Bomber Offensive (CBO) that would be complementary rather than competitive in nature.[61] Thus, RAF Bomber Command would continue its doctrine of area bombing at night, and the US Eighth Air Force would conduct high altitude, precision daylight bombing. The targets were designated in order as "submarine construction, aircraft industry, ball bearings, oil, synthetic rubber and military transport vehicles"—similar to AWPD-1 and AWPD-42 with the exception of the first target.[62] The stated objective of the CBO was the "fatal weakening" of Germany in preparation for the ground invasion of the continent.[63] The crowning moment for US airpower was bittersweet for US strategic airpower advocates in that a combined strategic bombing offensive was formally recognized, but only in a supporting role for the eventual surface invasion.

The fact that Prime Minister Churchill believed in the value of strategic bombing probably did more to convince President Roosevelt of the potential of strategic airpower than anything else. As early as 1941 President Roosevelt realized the need for airpower to help defeat Germany but the question remained one of a viable strategy. The Casablanca Conference granted formal approval of both strategic bombing doctrines, but this decision was much more important to US airpower advocates than British. Strategic airpower was accepted in Great Britain before the conference, but in the US it was still a struggling concept vulnerable to the whims of US senior leadership. Only time (through the experience of World War Two) would tell if there was any value to an airpower doctrine, cultivated at the ACTS years earlier, that relied on the effectiveness of long range heavy bombers.

How Decisive Were Heavy Bombers?

The display of Allied air power in Europe was awesome. Over 1,440,000 bomber sorties and 2,680,000 fighter sorties were flown, dropping just under 2,700,000 tons of bombs.[64] The bombings inflicted tremendous damage on the Germany homeland; major cities were reduced to

rubble and industry was "temporarily paralyzed."[65] Despite the evident destruction of the Allied bombing campaign, its effectiveness was still in question.

The United States Strategic Bombing Surveys provide an excellent summation of Allied airpower in Europe.

> Allied air power was decisive in the war in Western Europe. Hindsight inevitably suggests that it might have been employed differently or better in some respects. Nevertheless, it was decisive. In the air, its victory was complete. At sea, its contribution, combined with naval power, brought an end to the enemy's greatest naval threat—the U-boat; on land, it helped turn the tide overwhelmingly in favor of Allied ground forces. Its power and superiority made possible the success of the invasion. It brought the economy which sustained the enemy's armed forces to virtual collapse, although the full effects of this collapse had not reached the enemy's front lines when they were overrun by Allied forces. It brought home to the German people the full impact of modern war with all its horror and suffering. Its imprint on the German nation will be lasting.[66]

This assessment is somewhat ambiguous concerning the decisiveness of strategic bombing. Air superiority, the U-boat campaign, and the auxiliary role of tactical airpower were all considered decisive yet the report tactfully avoided calling the attacks on the German economy and population decisive. However, later the report states: "Her armies were still in the field. But with the impending collapse of the supporting economy, the indications are convincing that they would have had to cease fighting—any effecting fighting—within a few months. Germany was mortally wounded."[67] With this assessment the survey team performed a valuable service by investigating the link between economic infrastructure and military strength at the battle fronts, and providing a quantitative assessment of the relationship. Strategic airpower was decisive in Europe but only when considered in the context of the synergistic dynamics of airpower and land and sea power.

In the Pacific, the results of strategic bombing appear more conclusive because command of the air was gained sooner than in Europe. With its poor air defenses, Japan was no match for the B-29 formations that pulverized city after city in a formidable display of conventional

strategic airpower, which was proving itself in conjunction with the submarine blockade. However, the atomic bombings of Hiroshima and Nagasaki shoved conventional strategic airpower back into the shadows from which it was conceived. Conventional bombs were now outclassed when the classic Douhet weapon was available in the bomb bay of a single B-29 heavy bomber. This was an important turning point in the evolution of conventional strategic airpower. Just as it was gaining acceptance as a decisive weapon in the Pacific war, the atomic bomb made the idea of conventional strategic airpower relatively obsolete.

Heavy Bombers and Nuclear Weapons

The long range heavy bomber emerged from World War Two as the sole platform for delivering nuclear bombs, cementing the infatuation of the Air Force with these aircraft. Missile technology was in its infancy and still considered at least a decade away from achieving a nuclear payload delivery capability. Thus, heavy bombers enjoyed a prominence in the Department of Defense throughout the 1950s and into the early 1960s because of their nuclear delivery capability, essentially grabbing the doctrinal spotlight from conventional airpower.

The Anomaly of Korea

The impressive performance of B-29 bombers in Korea was due more to their flexibility in employment than their impact on the outcome of the war. The Far East Air Forces (FEAF) Bomber Command initially advocated burning 5 major cities in North Korea and destroying approximately 18 strategic industrial targets but the political constraints precluded fire bombing cities.[68] Destroying primary industrial targets early in the war, the B-29s were then employed in a variety of tactical operations including close air support (CAS) and bombing enemy airfields, transportation lines, supply dumps, and even bridges.[69] Their performance prompted General Otto P. Weyland, Commander, Far East Forces, to state: "One thing that should be clear to everyone by now is that air power is indivisible. ...Attempts to classify it by types of aircraft,

types of operations, or types of targets have led to confusion and misunderstandings. For that reason I have tried to think of it in terms of objectives, threats, and opportunities."[70]

Strategic air operations in Korea were a source of major frustration for FEAF Bomber Command because the vital strategic military and industrial targets in Manchuria were "out of bounds."[71] Furthermore, the number of interdiction targets varied directly with the location of the battle lines—the closer to the Yalu River, the fewer the targets—thus, communist vulnerability was attached to the length of their supply lines. The doctrine that evolved from ACTS and World War Two was never employed in North Korea, fueling beliefs by bomber advocates and others that the war was an aberration because strategic bombing could not be exploited.[72] Major General Emmett O'Donnell, Jr., Commander, FEAF Bomber Command stated:

> We have learned nothing new in tactics or techniques during this campaign. ...Our operations… in Korea have simply applied the lessons of World War II, which are already thoroughly documented and firmly established. We advocate no change in aerial war plans or procurement based upon lessons of this experience. It is absolutely essential that we keep our minds on our primary objective, so clearly defined by the major power alignments of the day. It would be a national calamity if, as a result of this bitter, though small-scale, action we permit emotional advocates to revive outmoded concepts.[73]

The Air Force reacted to Korea by continuing to build up its strategic nuclear force—long range heavy bombers—at the expense of its conventional tactical force structure.

The Massive Retaliation Strategy

Secretary of State John Foster Dulles first discussed the idea of "massive retaliation" in his famous address to the Council on Foreign Relations in New York on January 25, 1954. On the subject of containing communism he stated: "The only effective way to stop prospective aggressors is to convince them in advance that if they commit aggression, they will be subjected to retaliatory blows so costly that their aggression will not be a profitable operation."[74] Perhaps more important than what Dulles stated was what he implied: In future conflicts the US might

not limit itself to the area of warfare but instead strike at the presumed source of the aggression—the Soviet Union and China. The effect of this strategy on the Air Force was remarkable.

The massive retaliation strategy gave the Air Force even more prestige ‘and power in relation to the Army and Navy. Here was a strategy that now had the potential to use nuclear weapons across the entire spectrum of war and not just total war. The Air Force, with its long range heavy bombers capable of nuclear delivery, flourished under this national strategy. It embraced this new direction with fervor and used this new-found momentum for further reliance on nuclear weapons to build up a huge inventory (in 1959 SAC possessed 3,207 aircraft) of long range heavy bombers by the late 1950s. This was the zenith of bomber culture influence in the Air Force.

Air Force culture revolving around long range heavy bombers owed its origins to the airpower theories of Trenchard, Dought, and Mitchell that highlighted the importance of strategic bombing operations. The Air Corps Tactical School (ACTS) refined and systematized these airpower theories into doctrine at a time when it was considered heresy within the Army to do so. Long range heavy bombers—not fighters—were required to pursue ACTS doctrine, and they represented the vehicle for an independent air force. The experience of World War Two confirmed more than denied the need for strategic airpower. Nuclear weapons then settled the argument fairly quickly, with conventional strategic airpower becoming a moot point. The experience of World War Two spawned the US Air Force, built upon the precepts of nuclear strategic airpower. Massive retaliation further solidified the Air Force’s reliance on long range heavy bombers to deliver nuclear bombs, thus the dominant bomber culture of the Air Force. In the early 1960s it began to shift from bombers to fighters, forever changing the face of the Air Force.

CHAPTER 3

AIR FORCE CULTURE AND FIGHTERS

The shift to a fighter culture was more gradual than sudden, more of an accumulation of events than anything else. The two greatest influences on this shift were technology and the Vietnam War. ICBMs and sea launched ballistic missiles (SLBMs) achieved operational status, reducing the number of long range heavy bombers, while the nature of the Vietnam War emphasized the application of fighter-bombers in North Vietnam over the use of heavy bombers. Conventional strategic airpower doctrine from World War Two did not lend itself well in a limited war in Southeast Asia (SEA)—an ignored lesson from the Korean War.

The Impact of Technology on Heavy Bombers

The impact of technology on long range heavy bombers can be discussed in three specific areas. First, air-to-air refueling solved the problem of range for bombers and especially fighters because they had the most to gain from increased range. Refueling closed the gap between heavy bombers and fighters for most conventional airpower applications. Second, as the number of ICBMs and SLBMs in the US inventory increased, the number of long range heavy bombers decreased. This was particularly evident in the early 1960s as missiles were more cost effective and their accuracy was ever- improving. Third, fighter capabilities increased to the point where they could be employed in a variety of bombing applications. No longer was the fighter confined only to tactical bombing but was often just as capable of performing strategic missions as the heavy bomber.

Air-to-Air Refueling

Attempts at air refueling began soon after man learned to fly. Early attempts included passing cans of gasoline from one open cockpit to another while flying in formation.[75] Major Carl A. Spaatz focused attention on air refueling when he remained airborne for 150 hours in

1929.[76] The British then became interested in air refueling, conducting several tests during the 1930s, until World War Two halted further testing. After the war, the British continued developing air refueling for commercial purposes and they deserve most of the credit for proving its feasibility.[77] In 1948 the US sought the help of the British in developing a refueling system resulting in the Air Force converting sixty SAC B-29 aircraft to tankers.[78] Thus, air refueling became an integral part of the US Air Force. Its impact was phenomenal, changing the face of American airpower.

Air refueling to a great extent solved the problem of range for any aircraft that was modified for air refueling operations. As mentioned earlier, the fighters gained much more utility from air refueling than the heavy bombers. For example, TAC could now deploy to overseas units because a KC-135 ("mother hen") could escort fighters ("chicks") across the ocean—a feat previously the domain of only the long range heavy bombers and other large aircraft.[79] The impact of air refueling in the Vietnam War can be described as follows:

> The primary aircraft used for bombing North Vietnam was the F-105, with escort provided by F-4 aircraft. Since neither of these planes had the capability to bomb all of North Vietnam with a full load of ordnance and return to their Thailand bases, air refueling was essential to mission accomplishment.
>
> Air refueling, both pre-strike and post-strike, enabled the tactical aircraft to take off with full weapon loads, strike at any target in North Vietnam, and still return to their home station.
>
> In addition, it added flexibility to all missions by allowing for target changes after takeoff, and it allowed second passes on priority targets with selection of targets of opportunity. During target acquisition, it allowed the fighters to use afterburners to avoid enemy defenses and still have fuel to accomplish the mission.
>
> Finally, air refueling allowed the use of bases away from the areas of conflict, which greatly enhanced the entire tactical force operation and aided in mission success.[80]

To realize the impact of air refueling on fighter operations, one need only imagine air refueling not being available during the Vietnam War. The entire complexion of the US bombing

problem in North Vietnam would have changed. The US in all likelihood would have used the B-52s more extensively in the North because of their range. F-105s would not have been able to conduct bombing operations in the North unless they were located in a vulnerable position close to the border of North Vietnam. Even then, the F-105s would not have had the flexibility described above. In a nutshell, air refueling enabled the fighters to "fly longer missions, carry a greater ordnance load, spend more time on target, and use more diversified tactics"—it turned tactical fighters into strategic bombers.[81] The impact of air refueling on increasing the capabilities and enhancing the worth of fighters should not be underestimated. Another technological development also fueled the shift in Air Force culture from heavy bombers to fighters.

The Impact of ICBMs and SLBMs on Heavy Bombers

As ICBMs and SLBMs entered Air Force and Navy inventories the number of heavy bombers declined, a trend particularly evident from 1960 through 1966. In 1960 SAC had 1,716 heavy bombers (this does not include 19 B/TB-58 aircraft because they were not heavy bombers) and only 12 Atlas ICBMs. By 1966, however, SAC had only 591 B-52s and 968 ICBMs. SAC's B-47s were phased out as ICBMs came into the inventory. ICBMs and SLBMs proved to be formidable competition in competing for the US nuclear mission because they were more cost effective and survivable than heavy bombers. Missiles did not have to routinely fly to maintain air crew proficiency, nor did they require as much maintenance. Operating costs for ICBMs were therefore much lower than those for heavy bombers. In addition, ICBMs and SLBMs were not as vulnerable as bombers to a preemptive enemy first strike, and they could strike their targets much faster than bombers. Another reason involved the change in national strategy.

In the 1950s the US held to the "massive retaliation" strategy to deal with the entire spectrum of conflict. In the mid-1960s, this evolved into an "assured destruction" nuclear

strategy combined with a "flexible response" conventional strategy. The assured destruction strategy was described by Secretary of Defense Robert S. McNamara before Subcommittee No. 2 of the Committee on Armed Services, House of Representatives in January 1966. It involved the capability "To deter deliberate nuclear attack upon the United States and its allies by maintaining, continuously, a highly reliable ability to inflict an unacceptable degree of damage upon any single aggressor, or combination of aggressors, at any time during the course of a strategic nuclear exchange, even after absorbing a surprise first strike."[82] McNamara then went on to say:

> Given current expectations of vulnerability to enemy attack (before and after launch), and simplicity and controllability of operation, missiles are preferred as the primary weapon for the assured destruction mission. Their ability to ride out even a heavy nuclear surprise attack and still remain available for retaliation at times of our own choosing weighs heavily in this preference.
>
> In summary, for the assured destruction mission, manned bombers must be considered in a supplementary role. In that role they can force the enemy to provide defense against aircraft in addition to defense against missiles. ...In this role, however, large bomber forces are not needed. A few hundred aircraft can fulfill this function. Accordingly, as will be discussed later, we propose to maintain indefinitely an effective manned bomber capability in our strategic offensive forces.[83]

Thus, in the span of one decade, SAC's manned bombers lost their omnipotent status as sole carrier of nuclear weapons (not to mention the instrument of national strategy) operating now in a supplementary role, with ICBMs and SLBMs as the primary instrument of national strategy. The impact was such that SAC lost 66 percent of its heavy bombers from 1960 to 1966 with a corresponding loss in force structure. SAC was still dominant, but if one assumes a relationship exists between size of combat aircraft inventories and influence, then it follows that SAC's prevalence was gradually declining because SAC was losing the means to define itself. Furthermore, as more ICBMs came into the inventory SAC's force structure became increasingly one-dimensional, available for only nuclear exchanges.

Another interesting development during this time frame was the trend toward smaller bombers. The B/TB-5B aircraft was in SAC's inventory from 1960 to 1969. This supersonic aircraft was nuclear only and soon proved to be too costly to operate in small numbers (inventory peaked at 94 in 1964). FB-111A aircraft came into SAC's inventory in 1969, designed to replace the B-52C-F model aircraft. The conventional and nuclear capable FB-111As (72 in all) were projected as the bridge from the B-52G/H models to the Advanced Manned Strategic Aircraft (AMSA), the forerunner of the B-1. The major reason for buying the B/TB-5B and FB-111A aircraft was probably financial. Two hundred small bombers were cheaper to buy than two hundred heavy bombers that were to be used in a supplementary role in terms of national strategy. Technology was now making the smaller fighter-bombers just as effective in serving national strategy as the larger heavy bombers.

Increased Fighter Capabilities

Technological improvements in speed, accuracy, survivability, maneuverability, air-to-air and ground missiles, and bomb payload capacity have all made fighters a premier platform of weapon delivery for the Air Force. The fighters of today have more firepower (bombs, missiles, and guns) and range (thanks to air refueling) than the B-17 workhorse of World War Two. During the Gulf War F-111s flew strategic strikes against command bunkers located in the heartland of Iraq while F-15Es struck nuclear-biological-chemical (NBC) targets. US senior leadership had more confidence in these aircraft with their precision guided munitions (PGMs) to accomplish these surgical strategic strikes than B-52s dropping iron bombs. Fighters have greater bombing accuracy (because of PGMs) than the heavy bombers. The above factors when combined, tilted the balance in favor of fighters over heavy bombers in the majority of airpower applications.

Impact of the Vietnam War on Air Force Culture

The impact of the Vietnam War on Air Force culture should not be underestimated. Strategic airpower was not decisive in this long protracted limited war, but there were some instances of tactical decisiveness. Initially, the Air Force was not allowed to pursue its doctrine of strategic bombing of the enemy's vital centers of production, thus it struggled to conduct the incremental application of airpower for limited objectives in the Rolling Thunder campaign. The Air Force did not have a doctrine nor the technology for the incremental, surgical application of airpower that Rolling Thunder required. To further exacerbate the problem, civilian leadership did not understand the importance of attaining some form of air superiority before an incremental application of airpower could be made.

The B-52 Arc Light missions were confined mainly to the south where they bombed targets such as enemy camps, storage facilities, and transportation nodes—more or less a defensive application of heavy bombers. It was not until the Linebacker operations in 1972 that the traditional doctrine of the Air Force was allowed to surface. With the help of technology in the form of precision guided bombs the Air Force and Navy were able to conduct a traditional air campaign that would isolate North Vietnam by mining its ports and interdicting lines of communication until Hanoi agreed to a cease-fire and to release American prisoners of war as a prelude to US withdrawal.[84] Linebacker One was a signal success in an otherwise disappointing air war. Linebacker Two was also successful in getting the North Vietnamese leadership back to the negotiating table and ending US involvement in the war. Thus the air war in Vietnam started ineptly with Rolling Thunder and ended on an optimistic note with the Linebacker operations, a vindication of airpower doctrine for both SAC and TAC. Air commanders made comparisons of the Linebacker operations with the Joint Chiefs of Staff (JCS) ninety-four target plan, asserting that this traditional air campaign would have ended the war in 1965.[85] Afterward, the Air Force

chose to ignore the Vietnam War, treating it, as it had the Korean War, as an anomaly, an aberration that was not likely to occur again. The feeling among Air Force personnel was that airpower was never given a chance to pursue its doctrine until it was too late to win the war.

Fighters carried the burden of the war in Vietnam. It was commonplace for the F-105s and F-4s to go north to perform strategic conventional bombing missions while the B-52s conducted Arc Light missions in the south. The results of this situation was significant. Because fighter pilots bore the brunt of the air war in Vietnam, they gained the majority of combat experience.. Implanted in their thinking was the value of precision guided munitions on fighters and not bombers. Fighters now had the confidence of civilian leadership to conduct conventional strategic missions in any future conflict while heavy bombers would be relegated to dropping "dumb" (iron) bombs. Another important point was the majority of future leaders in the Air Force earned their combat experience in the war flying fighters, not heavy bombers, encouraging a fighter orientation in future leadership.

Another reason for the fighters bearing the brunt of the air war in Vietnam was that SAC was not keen to even engage in conventional operations. SAC had committed to the nuclear mission since World War Two and had ignored conventional applications of airpower (so had the tactical air forces to a large degree). Comprising two-thirds of the nuclear triad, SAC felt more comfortable sustaining its mission for the Cold War than honing its conventional skills in a limited war. Thus, TAC coopted SAC's conventional strategic mission when it conducted the majority of strategic bombing in North Vietnam.

CHAPTER 4

AIRLAND BATTLE AND CONVENTIONAL STRATEGIC AIRPOWER

After the Vietnam War the Air Force turned to the more traditional enemy—the Soviet Union in Europe. It concentrated on tactical and operational applications of airpower to support NATO strategy and did not place much emphasis on strategic airpower. NATO doctrine did not permit offensive operations deep into Warsaw Pact countries. Heavy bombers represented strategic doctrine in peacetime, and would probably be involved with the nuclear mission in the Soviet Union rather than the European theater in the event of conflict. Fighters were the preferred platforms in this theater for they offered the most flexibility considering the constraints of a NATO-Warsaw Pact environment.

The AirLand Battle doctrine, though not official Air Force doctrine, was a by-product of tactical and operational thought that has dominated the Air Force since Vietnam. It was the fighter culture's reason for existence. To show the relationship between AirLand Battle and conventional strategic airpower, it is necessary to define AirLand Battle.

AirLand Battle Defined

AirLand Battle was an Army doctrine introduced in 1980 by General Donn A. Starry to deal with the modern battlefield in Europe. It was based on three propositions:

> 1. The Operational Maneuver Groups (OMGs) and Soviet airpower may break through and tie down in-theater NATO reserves in NATO rear areas, and delay the arrival of reinforcements from the US.
> 2. The Battle against the OMGs and Soviet airpower is equal in importance to the fight with the first echelon.
> 3. If in-theater NATO reserves are tied up initially, the main second- and third-echelon Fronts must be delayed and disrupted or destroyed prior to reaching the forward edge of the main battle area.[86]

AirLand Battle was designed to exploit "the vulnerabilities of Soviet/Warsaw Pact armies—vulnerabilities resulting largely from their in-echelon combat deployment."[87]

Specifically, AirLand Battle called for the Army, with the support of the Air Force, to accomplish three things:

> 1. See deep and begin early to disrupt, delay, and destroy follow-on/reinforcing echelons.
> 2. Move fast against the assault echelons.
> 3. Finish the opening fight against assault and follow-on echelons rapidly so as to go on the attack and finish the battle against the assault armies before follow-on armies can join the battle.[88]

NATO and Warsaw Pact forces were essentially equal on the front line. Behind the front line, however, the Warsaw Pact enjoyed a huge advantage in reinforcing troops, tanks, aircraft, and other equipment. AirLand Battle would hold the front line and attack the second and third echelon troops before they could be brought forward to exploit any NATO weaknesses on the battlefield. The key to AirLand Battle was Battlefield Air Interdiction (BAI) which consisted of "attacks against land force targets to produce a near-term effect on the scheme of maneuver of friendly forces but not carried out in close proximity to friendly forces."[89] The Air Force, conducting BAI, would delay the second and third echelons in getting to the front lines. The key to effective BAI would be accurate intelligence. In addition to BAI, the Air Force would conduct extensive Close Air Support (CAS) operations synchronized with the friendly ground forces. Thus, the stage was set for conventional strategic airpower to lose its appeal to an Air Force fighter culture.

Impact of AirLand Battle on Conventional Strategic Airpower

Conventional strategic airpower suffered near obscurity in the post-Vietnam era. Perhaps the impact of AirLand Battle on conventional strategic airpower was best illustrated by the Commander, Tactical Air Command (TAC) who stated in 1988:

> Supporting the Army is a vitally important part of the Air Force mission—whether it involves interdiction, close air support or counter air. Outside of strategic air defense, everything that tactical air does directly supports the airland battle. Everything that tactical air does directly supports Army operations. Whether it's shooting down enemy airplanes, destroying a tank factory, attacking reinforcements

> or killing armor on the front line, tactical air's objective is to give friendly ground forces the advantage on the battlefield.[90]

The Commander of TAC did not mention that his forces would accomplish conventional strategic offensive missions. The only strategic mission he mentioned was the classic fighter mission of strategic air defense. This approach leaves out one important lesson from Vietnam and Korea: The indivisibility of airpower, that is, fighters flying strategic, operational and tactical missions, with heavy bombers doing the same. It was the F-105s and F-4s that performed the majority of Air Force strategic bombing missions in North Vietnam, not the B-52s. AirLand Battle doctrine does not acknowledge conventional strategic airpower. "Tactical air force missions which contribute most directly to land operations are counter air, air interdiction, close air support, special operations, and surveillance and reconnaissance."[91] This concept is perfectly understandable in terms of supporting the Army. What is not understood is why Air Force leaders could acknowledge these missions for the tactical air forces but not even mention the potential for conventional strategic airpower applications.

After the Vietnam War, the European theater grabbed the spotlight for Air Force airpower applications. There, airpower was counted on to prove decisive in air interdiction (AI), BAI and CAS operations, just as it did years ago in World War Two. Air Force leaders unofficially embraced the AirLand Battle doctrine with such vigor that the conventional strategic airpower mission was lost. Perhaps this was some form of backlash from the Vietnam War where the fighters bore the brunt of the war by flying the majority of strategic missions in the North and yet airpower was not decisive. SAC to its credit was beginning to revive its conventional mission profiles but not beyond the superficial level because of its attachment to the nuclear mission. By the mid-70s, Air Force leaders (especially in the major commands) were fighter oriented and were probably anxious to "get back to the basics" by focusing on a doctrine that emphasized

missions they were more familiar with.

Thus, the Air Force entered the 1980s with a tactical and operational versus strategic orientation to airpower which carried over into the 1990s. AirLand Battle dominated Air Force thought in the European theater because it appealed to Air Force leaders and was perceived as the most effective employment of combat capability. NATO doctrine did not require offensive operations into Warsaw Pact countries, so there was no reason to contemplate strategic operations because SAC would conduct nuclear strikes. This was in stark contrast to the handshake agreement between Eisenhower and Spaatz in 1946, in the wake of strategic airpower dominance in World War Two, to keep at least some tactical air forces in the inventory for auxiliary applications.[92]

CHAPTER 5

A CHANGE IN AIR FORCE CULTURE

In order to determine any shifts in culture, a snapshot of the service will be taken at three separate years: 1960, 1975, and 1990. These years were chosen because they represent distinct phases of Air Force existence. In 1960 Strategic Air Command (SAC) was predominant in the Air Force because its long range heavy bombers were recognized as the preeminent platform for nuclear delivery. Conventional war was given little priority in resource allocation. In 1975 the Air Force was beginning its recovery from the Vietnam War and the signs of a change in culture became apparent. In 1990 the shift in culture became obvious as Tactical Air Command (TAC) achieved dominance within the Air Force. These three years (1960, 1975, and 1990) will be examined according to the criteria outlined in the first chapter—leadership, force structure, and doctrine.

Air Force Culture in 1960

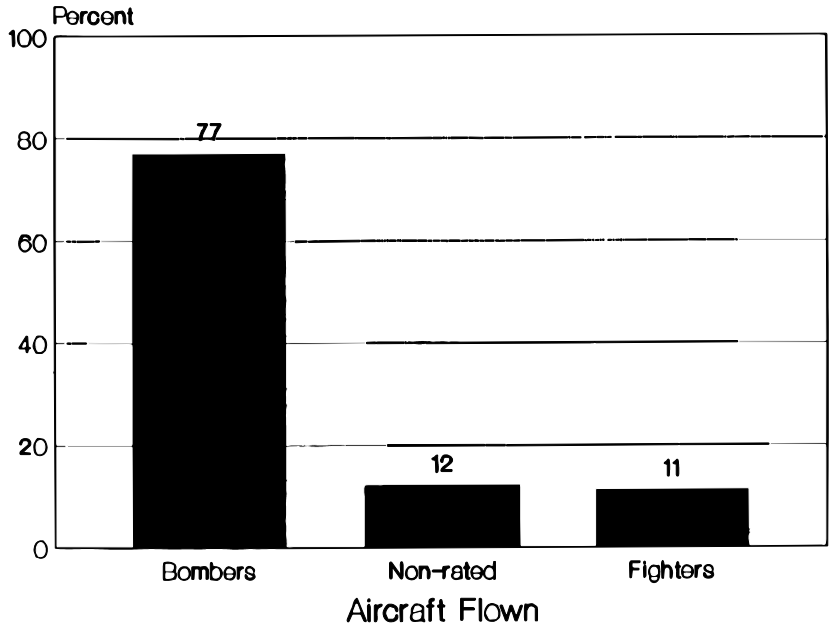
Air Force culture in 1960 was basically a reflection of bombing doctrine developed at the Air Corps Tactical School (ACTS) during the 1920s and 1930s, US airpower experience in World War Two, and the national strategy of massive retaliation articulated in the 1950s. It seemed logical at the time for the service to emphasize nuclear, not conventional warfare.

Air Force Leadership

Figure 1 illustrates the startling dominance of men who had flown long range heavy bombers in World War Two. Aircraft experience refers to the orientation and majority of time spent with particular weapon systems.

FIGURE 1

AIRCRAFT EXPERIENCE OF AIR FORCE LEADERS IN 1960



Of the 35 leadership positions reviewed in 1960 (Appendix 1), 77 percent were bomber oriented with non-rated and fighters surprisingly even. This dominance was found in both staff and major command positions. Bomber pilots occupied 70 percent of the 20 staff positions (Appendix 1) while non-rated generals were in 4 and fighter pilots only 2 positions. Furthermore, all key staff positions were occupied by bomber pilots with the exception of Deputy Chief of Staff for Operations. All of the major command positions were assigned to either fighter or bomber pilots; however, the latter's grip on the Air Force was absolute. They occupied all of the major command slots except for two—US Air Forces in Europe (USAFE) and Tactical Air Command (TAC). It seems as though bomber pilots were better rewarded for their efforts in World War Two than fighter pilots—more of them held key leadership positions. The force structure of the Air Force at this time also reflected a fascination with bomber preeminence.

Force Structure

Table 1 shows that SAC owned almost a quarter of the total active aircraft inventory with 3,701 aircraft—a remarkable achievement when one considers the vast majority of the command's aircraft were the relatively large, expensive heavy bombers and tankers. SAC at this time had 46 bases in the CONUS and 20 bases overseas in such locations as Puerto Rico, Great Britain, Spain, French Morocco, Labrador, Newfoundland, Guam, and Canada.[93]

In Table 2, fighters made up the largest group of active aircraft in the inventory followed by trainers and cargo planes. Bombers were fourth, but the figures are a bit deceptive in that the manpower and dollars required to support a bomber fleet of this size (not to mention tankers) were what made SAC so dominant at the time. Table 3 contrasts SAC's monolithic organization with the rest of the Air Force. SAC was over two and a half times larger than its nearest competitor for manpower, Air Defense Command (ADC), and over five and a half times the size of TAC. Similarly, 32 percent of the service's total pilot inventory on flying status served in SAC—most of whom flew heavy bombers—compared with 11 and 7 percent for ADC and TAC.[94] SAC's operations and maintenance expenses were over $713 million, the largest of any command.[95]

TABLE 1
TOTAL ACTIVE AIRCRAFT BY COMMAND[96]
30 JUNE 1960

	# Acft	Pct of Total
1. Strategic Air Command	3,701	24
2. Air Training Command	2,547	17
3. Air Defense Command	1,783	12
4. Tactical Air Command	1,709	11
5. US Air Forces, Europe	1,349	9
6. Air Materiel Command	1,024	7
7. Military Air Transport Service	987	6
8. Pacific Air Forces	806	5
9. Air Research & Development Command	542	4
10. Headquarters Command, USAF	357	2
11. Air University	166	1
12. Continental Air Command	130	1
13. Alaskan Air Command	125	1
14. US Air Force Academy	44	0
15. Caribbean Air Command	33	0
16. USAF Security Service	9	0
TOTAL	15,312	100

TABLE 2
FUNCTIONAL DISTRIBUTION OF ACTIVE AIRCRAFT[97]
30 JUNE 1960

	# Acft	Pct of Total
1. Fighter	3,922	26
2. Trainer	3,914	25
3. Cargo	2,549	17
4. Bomber	2,193	14
5. Tanker	1,230	8
6. Reconnaissance	685	4
7. Helicopter	257	2
8. Search and Rescue	244	2
9. Utility	170	1
10. Liaison	146	1
11. Special Research	2	0
TOTAL	15,312	100

TABLE 3
OFFICERS AND AIRMEN SERVING BY COMMAND[98]
30 JUNE 1960

	Officers	Airmen	Total
1. Strategic Air Command	36,931	201,701	238,632
2. Air Defense Command	12,638	82,242	94,880
3. Military Air Transport Service	12,410	74,604	87,014
4. US Air Forces, Europe	8,681	56,819	65,500
5. Air Training Command	10,101	54,059	64,160
6. Tactical Air Command	6,066	37,274	43,340
7. Pacific Air Forces	5,784	31,980	37,764
8. USAF Security Service	1,487	19,921	21,408
9. Air Rsrch & Dvlpmnt Cmd	6,054	15,303	21,357
10. Air Materiel Command	4,594	15,657	20,251
11. Headquarters Command, USAF	5,709	13,859	19,568
12. Alaskan Air Command	1,370	10,786	12,156
13. Continental Air Command	1,931	6,430	8,361
14. Air University	2,445	3,610	6,055
15. Headquarters, USAF	2,933	—	2,933
16. US Air Force Academy	634	1,034	1,668
17. Caribbean Air Command	238	998	1,236
18. AF Accting & Fin Ctr	62	18	80
TOTALS	120,068	626,295	746,363

Contemporary doctrine also helped create a force structure dominated by long range heavy bombers.

Doctrine

The Air Force in 1960 articulated its official doctrine in Air Force Manual l-2, dated 1 December 1959. This brief manual stressed the offensive nature of airpower in attaining national objectives and equated strategic airpower with nuclear weapon delivery. Chapter two laid the foundation for doctrinal emphasis on strategic bombing by discussing it as the preeminent military instrument of national policy. The military instrument was to be employed to bring about a desired condition favorable to the US. "In this sense victory in a military operation is not an end in itself; it is a means to an end. The ultimate objective always must reach beyond the victory itself to the securing of a desired condition resulting from the victory."[99] Military

operations such as destruction and physical domination of an opponent (to include capture and occupation of territory) might be irrelevant in achieving desired conditions, and perhaps "other effects upon an adversary would be more advantageous."[100] Chapter two paid lip service to employing airpower in limited war, the Korean War notwithstanding, with the revealing statement: "It follows, therefore, that the best preparation for limited war is proper preparation for general war."[101] This statement seemed consistent with the massive retaliation strategy that emphasized strategic nuclear weapons to not only deter limited war but to win it if necessary. National and Air Force dependence on nuclear weapons for maintaining a cost-effective deterrent policy against Communist expansion appeared to undermine all references to conducting limited war through conventional airpower.

Chapters four and five of the manual provide the strongest support for the decisiveness of strategic bombing doctrine. Chapter four begins with the assertion that forces of the Air Force are employed "to deter general or limited war," and if general war occurs, "to defeat the enemy as quickly as possible," while limited war stressed being "able immediately to conduct selective operations wherever required for the prompt resolution of the conflict under acceptable circumstances."[102] The striking feature of these statements is the implication that the Air Force could defeat the enemy in general or limited war without aid from land or sea forces. By attaining "general supremacy in the aerospace," these forces, "by virtue of their capability to penetrate to the central sources of an enemy nation's strength, may be employed against selected objectives to reduce the enemy's will and capacity to resist or to pursue a war objective."[103] The employment of aerospace forces could be against a nation's homeland, satellite states, or even proxy areas of combat.[104] The manual made it perfectly clear that in any of the above scenarios, the effects of aerospace power could be decisive. Strategic offensive airpower was further emphasized in chapter five:

> With aerospace forces and modern weapon systems available, it no longer is necessary to defeat opposing armed forces as a prerequisite to conducting operations directly against an opponent, as dictated by national decision, either in his sovereign territory or in any other locality.
>
> Of the various types of military forces, those which conduct operations in the aerospace are most capable of decisive results.

These statements were direct confirmation of the beliefs in the value of strategic bombing conducted in World War Two. The manual placed little emphasis on tactical airpower—the decisive form of airpower was deemed to be strategic. The impact of this doctrine could be felt also in the airframes the service was buying at the time.

During the 3 year window of 1959-1961, the Air Force procured a mixture of bombers, fighters, tankers, trainers, and cargo aircraft. Examining Table 4 one finds 645 fighters (F-105D, F-106A/B, and F101B) were bought compared with 227 bombers (B-52H, B-58A, and B-52G), however, the flyaway cost of the bombers was higher. The B-52H, B-58A, and B-52G unit costs were $8,965,597, $15,245,471, and $8,040,176 respectively while the F-105D, F-106A/B, and F101B were $2,873,745, $3,400,000, and $1,819,048 each. Thus the bombers were the most expensive aircraft purchased at the time (a total of $2.5 billion versus $1.8 billion for fighters) which meant the Air Force was putting more money into bombers and other strategic airpower assets.

TABLE 4
AIRCRAFT PROCUREMENT PROGRAMS FY 59-61[105]

Aircraft	# Acft
1. F-105D	387
2. T-37A/B	280
3. T-38A	207
4. KC-135A	202
5. F-106A/B	165
6. B-52H	102
7. H-43B	96
8. T-39A/B	94
9. F-101B	93
10. C-130B/E	89
11. B-58A	86
12. B-52G	39
13. U-3A/B	35
14. C-135A/B	30
15. C-133	15
16. VC-140B	6
17. C-140A	5
TOTAL	1931

Air Force Culture in 1975

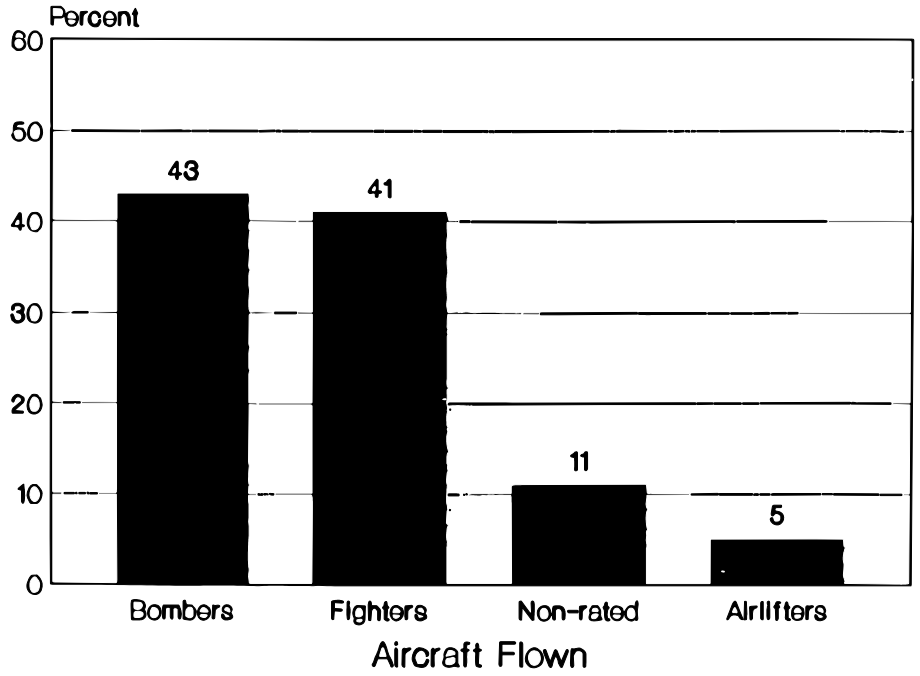
By 1975 evidence for the process of a shift in Air Force culture was overwhelming. Forces were operating that were essentially changing the face of the service. Conventional operations were beginning to take precedence over nuclear.

Air Force Leadership

The Air Force in 1975 was in the middle of a cultural shift as no one group seemed to dominate the service. After examining 38 top leadership positions (Appendix 2), the bomber and fighter leaders were roughly even in their influence. The bomber generals decreased 44 percent along with 8 percent for non-rated while the fighters increased a noteworthy 273 percent. The majority of the fighter increase appeared to come at the expense of bomber generals. Perhaps the startling increase in fighter generals was a

FIGURE 2

AIRCRAFT EXPERIENCE OF AIR FORCE LEADERS IN 1975



result of the same phenomenon in 1960 where airmen who received the most recognition from war formed the nucleus of a group destined for higher command. In 1975 more fighters than bomber pilots flew combat sorties against North Vietnam, thus garnering more recognition for executing the bulk of the air war.

The balance of influence between bomber and fighter generals was readily apparent after examining staff and major command positions. Bombers occupied 52, fighters 22, non-rated 17, and airlift 9 percent of the 23 top staff slots. A look at the major commands, however, revealed almost the inverse of staff characteristics in that bomber generals led only 30 while fighter generals led 70 percent of the 15 major commands. It seemed the shift in culture from bombers to fighters began and established itself in the major commands before any similar activity in the staff.

Force Structure

A review of Table 5 reveals that all major commands lost aircraft from 1960 to 1975 with the exception of Military Airlift Command (MAC) which increased 3 percent. TAC then owned more aircraft (1,633) than any command, representing only a 4 percent decrease from 1960 compared with an astounding 66 percent decrease for SAC that owned 1,244 aircraft in 1975. SAC now had 28 bases with only 1 overseas (Guam), a decrease of 37 bases from 1960.[106] This reduction in force structure was probably more of a function of aircraft than influence because SAC was more than the equal of any command with its aircraft and inter-continental ballistic missile (ICBM) inventories, manpower, and budget. But nevertheless, perhaps there is a relationship between aircraft and influence.

From 1960 to 1975 the Air Force decreased its inventory by 8,073 aircraft or 53 percent. An inspection of Table 6 will show that some types of aircraft decreased more than others. There were 1,984 fighter/intercept aircraft in 1975 as opposed to 3,922 in 1960 for a 49 percent decrease, but if the 315 attack aircraft are included the loss is 41 percent. Bombers decreased 1,695 units or 77 percent, significantly more than the service average of 53 percent. This dramatic reduction implied other influences on bombers than a reduction in forces.

As can be seen from Table 7, SAC is still the largest command in terms of manpower in 1975 but it has lost 109,640 personnel—including 9,993 pilots—or 46 percent since 1960. Again this reduction in force was probably due to loss of aircraft rather than waning influence. TAC grew

TABLE 5

TOTAL ACTIVE AIRCRAFT BY COMMAND[107]
30 JUNE 1975

	# Acft	Pct	+/- 1960
1. Tactical Air Command	1,633	23	-4%
2. Air Training Command	1,589	22	-38%
3. Strategic Air Command	1,244	17	-66%
4. Military Airlift Command	1,012	14	+ 3%
5. US Air Forces, Europe	673	9	-50%
6. Pacific Air Forces	394	5	-51%
7. Aerospace Defense Command	324	5	-82%
8. USAF Systems Command	249	4	-54%
9. Alaskan Air Command	61	1	-51%
10. Air Force Logistics Command	21	0	-98%
11. Headquarters Command	21	0	-94%
12. USAF Southern Command	12	0	-64%
13. Air Force Communications Service	6	0	
TOTAL	7,239	100	

TABLE 6
FUNCTIONAL DISTRIBUTION OF ACTIVE AIRCRAFT[108]
AS OF END FY 1975

	# Acft	Pct	+/- 1960
1. Fighter/Intercept	1,984	27	-49%
2. Trainer	1,861	26	-52%
3. Cargo/Transport	927	13	-64%
4. Tanker	657	9	-47%
5. Bomber	498	7	-77%
6. Recon/Electronic	494	7	-28%
7. Attack	315	4	—
8. Helicopter	269	4	+ 5%
9. Obs/Utility	189	2	+ 11%
10. Rescue (Fix Wing)	44	1	-82%
11. Others	1	0	—
TOTAL	7,239	100	

from 43,340 officers and airmen in 1960 to 70,525 in 1975, an impressive increase of 63 percent, more than any command. Furthermore, its pilot

TABLE 7
OFFICERS AND AIRMEN SERVING BY COMMAND[109]
30 JUNE 1975

	Officers	Airmen	Total
1. Strategic Air Command	21,848	107,144	128,992
2. Air Training Command	13,190	70,708	83,898
3. Tactical Air Command	9,545	60,980	70,525
4. Military Airlift Command	12,281	58,113	70,394
5. US Air Forces, Europe	6,113	40,563	46,676
6. AF Communications Service	2,685	37,029	39,714
7. Pacific Air Forces	4,718	33,952	38,670
8. Aerospace Defense Command	3,767	24,822	28,589
9. AF Systems Command	9,595	17,078	26,673
10. Headquarters Command, USAF	5,124	13,426	18,550
11. USAF Security Service	1,008	14,772	15,780
12. AF Logistics Command	2,644	7,284	9,928
13. Alaskan Air Command	865	7,870	8,735
14. Air University	4,850	2,972	7,822
15. Headquarters, US Air Force	3,107	—	3,107
16. USAF Academy	1,049	1,195	2,244
17. USAF Southern Command	211	1,295	1,506
18. AF OSI	481	1,006	1,487
19. AF Military Personnel Ctr	432	763	1,195
20. AF Data Automation Agency	364	827	1,191
21. AF Reserve	192	643	835
22. AF Audit Agency	407	102	509
23. AF Intelligence Service	177	233	410
24. AF Inspection & Safety Ctr	294	75	369
25. AF Accting & Fin Ctr	33	213	246
26. AF Test & Eva1 Ctr	132	26	158
27. Air Reserve Pers Ctr	49	85	134
TOTALS	105,161	503,176	608,337

inventory increased by 621 from 3,357 to 3,978 or 18 percent. It seemed that SAC was decreasing in size due to loss of aircraft while TAC was increasing in size because, among other things, it was maintaining its aircraft inventory and gaining more influence, perhaps due to the Vietnam experience.

Despite its loss of aircraft and personnel, SAC's operations and maintenance (O&M) expenditures for 1975 were second in the Air Force and over twice the amount for TAC (Table 8). This was probably due to SAC's ICBM inventory, which attained operational status in the 1960s, and the increasing costs of maintaining its aging bomber and tanker fleets. Besides leadership and force structure, doctrine also changed from 1960 to 1975.

TABLE 8
OPERATION AND MAINTENANCE—DIRECT EXPENSES—BY COMMAND[110]
(DOLLAR VALUES IN THOUSANDS) JUNE 1975

	Expenses	Pct of Total
1. AF Logistics Command	2,390,144	32
2. Strategic Air Command	1,032,755	14
3. Air Training Command	509,593	7
4. Tactical Air Command	492,703	6
5. Military Airlift Command	455,338	6
6. US Air Forces, Europe	378,801	5
7. Pacific Air Forces	355,958	5
8. AF Communications Service	349,000	5
9. Aerospace Defense Command	297,892	4
10. Air Force Reserve	295,955	4
11. AF Systems Command	266,254	3
12. Headquarters Command, USAF	92,020	1
13. Alaskan Air Command	87,337	1
14. Air University	69,814	1
15. USAF Security Service	63,192	1
16. USCINCRED	3,137	0
17. All Other (AFIN, USAFA, etc.)	392,329	5
TOTAL	7,532,222	100

Doctrine

The doctrine of 1975 clearly showed the effects of maintaining deterrence in the European theater on Air Force thinking—somewhat surprising considering the recent Vietnam debacle with its surreal baggage. Strategic airpower was still associated with nuclear weapon delivery as in 1959 doctrine, but now theater conventional warfare was emphasized because its

effective conduct was critical to deterring or controlling escalation to the nuclear threshold. This was established in chapter one of Air Force Manual 1-1, dated 15 January 1975.

> The strategic offensive and defensive forces of the United States are intended to deter attacks against the United States, its forces overseas, and its allies. Standing alone, these forces probably cannot deter the lower levels of armed conflict. Accordingly, general purpose forces capable of rapid deployment, and maintained by a logistics support capability that assures the forces can sustain operations, are a vital part of the military instrument for deterrence.[111]

In a bipolar world flexibility to respond commensurately against aggression across the entire spectrum of conflict was a foremost consideration for Air Force strategists, and the linchpin for this process was the effective waging of theater conventional warfare.

Chapter one also discussed the strategic triad, acknowledging the importance of not only manned bombers and ICBMs, but SLBMs as well. Together these three would form the foundation for deterrence of strategic nuclear war, still considered the highest priority for defense of the US. This was a departure from 1959 doctrine that strongly implied the Air Force could win wars independently of the other services. Strategic nuclear parity seemed to be assured with the triad, thus providing the springboard for focusing on theater conventional warfare at the expense of conventional strategic airpower, thought to be unnecessary in a European scenario.

One notable shortcoming in chapter three, found also in the 1959 doctrine, is the lack of discussion devoted to conventional strategic airpower. The manual discussed strategic attack primarily in terms of nuclear weapon delivery with only one obligatory reference to conventional strategic operations.

> Strategic attack is directed against selected vital targets of an enemy nation so as to destroy that nation's war-making capacity or its will to continue the conflict. Aerospace forces responsible for strategic nuclear attack are intended primarily to deter nuclear war and provide a war-fighting capability should deterrence fail. ...To provide flexibility for strategic attack in all potential environments, these aerospace forces maintain a capability to use either conventional or nuclear weapons.
>
> Strategic forces have the primary responsibility for strategic nuclear attack; their size and character being influenced by the basic strategy they are designed to

support.[112]

Maintaining a capability to employ conventional weapons was not one of SAC's high priorities due to the Soviet threat and the need to maintain nuclear deterrence. As a result SAC devoted most of its training and flying hours to nuclear, not conventional profile missions.

The discussion of theater conventional warfare provides insight into the increasing reliance on sophisticated fighter aircraft in support of conventional doctrine. "The wide range of potential conventional conflict requires availability of a variety of weapon systems. As in most levels of conflict, high performance aerospace vehicles are required in certain conventional warfare mission areas."[113] The implications for Air Force procurement policy are far-reaching; high performance aircraft will be needed to conduct theater conventional roles of a tactical versus strategic nature. Thus the long range heavy bomber, backbone of the 1959 doctrine, was bumped out of the 1975 doctrinal spotlight by sophisticated fighters, considered to be the anchor for the conventional theater in Europe.

Notice in Table 9 that no long range heavy bombers were purchased during the 3 year window in stark contrast to the procurement of 141 B-52G/H aircraft in 1960. There were, however, 4 B-1As in existence at this time in anticipation of a large Air Force buy. Most of the aircraft in the procurement program were for the benefit of tactical air forces reflecting

TABLE 9

AIRCRAFT PROCUREMENT PROGRAMS FY 74-76[114]

Aircraft	# Acft
1. F-15A	211
2. A-l0A	75
3. F-5E	71
4. A-7D	48
5. C-130H	42
6. C-12A	32
7. TF-15A	31
8. F-4E	24
9. F-111F	12
10. E-3A	10
11. E-4A	1
TOTAL	557

the doctrine of possessing a variety of high performance aircraft to engage in conventional warfare missions. Another reason for the emphasis on fighter aircraft may have been due to the notion they were more likely to become obsolescent faster, hence the need to purchase them more often. Whatever the reason, the Air Force was spending its money on what it considered tactical and not strategic assets—a substantial change from 1960 when one considers the service initially owed its existence to the heavy bomber.

Air Force Culture in 1990

By 1990 the transformation was complete—the Air Force was dominated by those with a fighter orientation. The majority of Air Force leadership flew fighters in the Vietnam War. Conventional warfare occupied center stage, while nuclear warfare had shifted into the background of mundane operations.

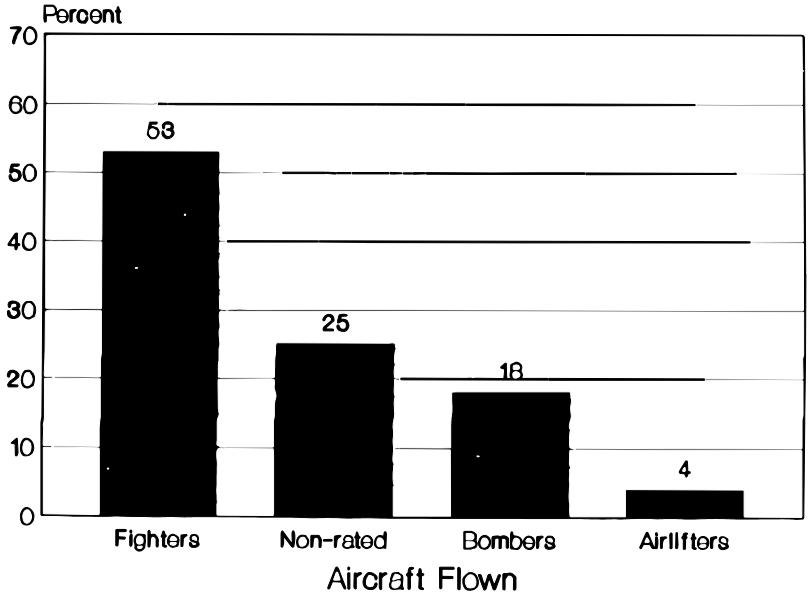
Air Force Leadership

Figure 3 shows that of the 36 leadership positions reviewed (Appendix 3), 53 percent had

fighter experience, an increase of 29 percent from 1975, and an amazing 382 percent from 1960. Meanwhile, only 18 percent of the staff and major command slots were filled by bomber generals, a decline of 58 percent from 1975 and an extraordinary 77 percent from 1960. Also remarkable was the rise in non-rated leadership which rose 127 percent from 1975, and 108 percent from 1960. The increase in non-rated and fighter leadership appeared to come at the expense of bombers because airlifters

FIGURE 3

AIRCRAFT EXPERIENCE OF AIR FORCE LEADERS IN 1990



remained essentially the same since 1975. Perhaps the rise in non-rated leadership was an indication of the beginning of another cultural shift in the Air Force—possibly space. As the service becomes more technical and specialized, there may be more senior command opportunities for non-rated officers.

Appendix 3 supports the notion that fighter generals dominated both the staff and major

commands. Fighters held 12 of the 23 staff positions, or 52 percent, with non-rated 26 and bombers 22 percent. Of the 13 major commands, fighter generals occupied 7 command slots for 54 percent compared with 23 for non-rated, 12 for airlifters, and 11 percent for bombers. All of the combat command slots were filled by fighter generals; there was even one commanding SAC.

Force Structure

Table 10 shows that all of the major commands lost aircraft from 1975 to 1990 with the exception of TAC, US Air Forces, Europe (USAFE), and Air Force Logistics Command (AFLC). TAC had 2,097 aircraft or 30 percent of the service total compared with SAC's 1,066 aircraft for 15 percent. What stands out in Table 10 is that TAC was the only command to realize a gain in aircraft from both 1975 and 1960 (28 and 23 percent), whereas SAC lost 14 percent from 1975 and 71 percent from 1960. Some possible reasons include: TAC absorbed aircraft from the deactivation of Aerospace Defense Command (ADC); TAC was the main beneficiary of the dominant fighter procurement programs; SAC lost bombers and tankers as ICBMs and SLBMs became operational.

Overall the Air Force had 426 fewer aircraft in 1990 than 1975 and 8,499 less than 1960. In Table 11 all categories of aircraft declined from

TABLE 10

TOTAL ACTIVE AIRCRAFT BY COMMAND[115]
SEPTEMBER 1990

	# Acft	+/- 1975	+/- 1960
1. Tactical Air Command	2,097	+ 28%	+ 23%
2. Air Training Command	1,313	- 17%	- 48%
3. Strategic Air Command	1,066	- 14%	- 71%
4. Military Airlift Command	970	-4%	- 2%
5. US Air Forces, Europe	723	+ 7%	- 46%
6. Pacific Air Forces	341	- 13%	- 58%
7. Air Force Systems	234	- 6%	- 57%
8. Air Force Logistics	90	+ 329%	- 91%
9. US Air Force Academy	77	—	+ 75%
10. Alaskan Air Command	60	- 2%	- 52%
TOTAL	6,971		

TABLE 11
FUNCTIONAL DISTRIBUTION OF ACTIVE AIRCRAFT[116]
FY 1990

	# Acft	+/- 1975	+/- 1960
1. Fighter/Att/Int	2,798	+ 22%	- 29%
2. Trainer	1,535	- 18%	- 61%
3. Cargo/Transport	814	- 11%	- 68%
4. Tanker	555	-16%	- 55%
5. Strategic Bomber	366	- 27%	- 83%
6. Reconnaissance	346	- 30%	- 49%
7. Helicopter	212	- 21%	- 18%
8. Other	141	—	—
9 Search/Rescue	36	- 18%	- 85%
TOTAL	6,813		

1975 to 1990 with the exception of fighter/attack/intercept that gained 22 percent of which most were owned by TAC. Notice bombers declined to 366 aircraft, a drop of 132 from 1975 and 1,827 from 1960, or 27 and 83 percent. Fighters increased by 534 aircraft from 1975 to 1990,and decreased by only 476 from 1960. The percentage of total active inventory for fighters increased from 26 to 32 to 41 percent from 1960 to 1975 to 1990 respectively, while bombers decreased from 14 to 7 to 5 percent. Fighters clearly dominated the Air Force inventory in 1990.

Another factor in TAC's ascendancy was the command clearly increased in size as shown in Table 12. This was probably as much a function of aircraft as influence, thus similar to SAC's situation in 1975 when the command shrank as a result of smaller aircraft inventories. SAC was still

TABLE 12
OFFICERS AND AIRMEN SERVING BY COMMAND[117]
1990

	Officers	Airmen	Total
1. Strategic Air Command	16,135	76,578	92,713
2. Tactical Air Command	12,666	74,887	87,553
3. Military Airlift Command	11,064	55,599	66,663
4. US Air Forces, Europe	6,601	50,974	57,575
5. Air Training Command	11,029	41,319	52,348
6. AF Communications Cmd	3,556	40,316	43,872
7. Pacific Air Forces Cmd	3,211	24,993	28,204
8. AF Systems Command	9,422	12,751	22,173
9. Separate Operating Agencies	4,656	7,691	12,347
10. Electronic Security Cmd	1,059	10,942	12,001
11. AF Logistics Command	3,142	8,545	11,687
12. AF Elements: OTH & Europe	6,073	5,197	11,270
13. Direct Reporting Units	3,585	4,188	7,773
14. Alaskan Air Command	838	6,462	7,300
15. Space Command	2,121	4,191	6,312
16. Air University	3,964	1,697	5,661
17. AF Operations Command	923	4,448	5,411
TOTAL	100,045	430,818	530,863

the largest command with 92,713 personnel, but this represented a decline of 28 and 61 percent from 1975 and 1960 while TAC increased by 24 and 102 percent. This was quite a reversal from 1960 when SAC was over 5 times the size of TAC (Table 3).

By 1990 the combat command with the largest O&M expenses was TAC, supplanting SAC from the position it held in 1960 and 1975. In Table 13 TAC was 3rd behind Air Force Logistics Command and Air Force Systems Command, an increase of 249 percent from 1975 compared with SAC's modest increase of only 41 percent. The effects of declining aircraft and ICBM inventories were taking their toll on SAC's share of the O&M budget while TAC was reaping the windfall of increased force structure.

TABLE 13
OPERATION AND MAINTENANCE—DIRECT EXPENSES—BY COMMAND[118]
(DOLLAR VALUES IN THOUSANDS) SEPTEMBER 1990

	Expenses	Pct of Total
1. AF Logistics Command	6,381,890	28
2. AF Systems Command	1,910,418	8
3. Tactical Air Command	1,721,990	8
4. Military Airlift Command	1,500,445	7
5. Strategic Air Command	1,455,212	6
6. US Air Forces, Europe	1,081,771	5
7. AF Communications Command	960,515	4
8. Pacific Air Forces	647,101	3
9. Space Command	619,427	3
10. Alaskan Air Command	210,991	1
11. Electronic Security Cmd	181,345	1
12. Air Training Command	179,353	1
13. Air University	157,194	1
14. AF Operations Command	31,284	0
15. All Other	5,415,323	24
TOTAL	22,454,259	100

Doctrine

The doctrine in use for the Air Force in 1990 came from the 1984 version of Air Force Manual 1-1 that represented a major improvement over the 1975 and 1959 doctrinal manuals. Noted improvements, include a new section on organizing, training, equipping, and sustaining aerospace forces as well as an expanded discussion of strategic airpower. The manual acknowledges the importance of land forces to win the land battle, naval forces to win the naval battle, and aerospace forces to win the aerospace battle—"to gain and/or maintain control of the aerospace environment and to take decisive actions immediately and directly against an enemy's warfighting capacity. ...As a critical element of the interdependent land-naval-aerospace team, aerospace power can be the decisive force in warfare."[119]

Chapter two comprises the heart of the manual, including an improved discussion on the employment of aerospace power in comparison with the 1975 manual. The indivisibility of airpower is again stressed with the following: "An air commander adjusts his plan to meet the requirements peculiar to a military action, but his guiding principle is to employ aerospace power as an indivisible entity based on objectives, threats, and opportunities."[120] The idea is to balance effects and influences desired with threats and opportunities in forming a broad plan of airpower employment.. "An air commander's broad plan will normally include offensive strategic and tactical actions which are designed to control the aerospace environment and neutralize or destroy the warfighting potential of an enemy."[121]

The importance of conducting simultaneous strategic and tactical actions against the "will and capabilities of an enemy" allows the air commander to seize the initiative and take advantage of the characteristics and capabilities of airpower.

> Strategic actions produce effects and influences which serve the needs of the overall war effort; tactical actions produce direct effects on the field of battle. Strategic actions normally involve attacks against the vital elements of an enemy's war

> sustaining capabilities and his will to wage war. Tactical actions are battle-related and normally urgent actions conducted against an enemy's massed or deployed forces, his lines of communication, and his command and control structures used to employ forces.[122]

Strategic and tactical actions should not be constrained by "geographic areas, operating environments, or types of vehicles."[123] One of the more controversial statements in the manual concerns their relationship: "Strategic and tactical actions are not mutually exclusive and to consider one in isolation of the other disregards their interdependence and their synergistic influence in warfare."[124] In the majority of applications this statement seems more than reasonable but there could be instances where strategic airpower is employed to achieve specific national objectives unrelated to the battle. The manual could have explored this scenario more thoroughly. Nevertheless, the importance of strategic attacks is reiterated as one of the primary reasons for gaining command of the air.

> Modern warfare has demonstrated the potential importance of strategic attacks against targets in an enemy's heartland. Attacks against heartland targets can produce benefits beyond the proportion of effort expended and costs involved. For this reason, an air commander must seize every opportunity to execute heartland attacks, but there are many considerations in taking these actions. These attacks may be limited by overriding political concerns, the intensity of enemy defenses, or more pressing needs on the battlefield.[125]

The influence of fighting a conventional theater conflict in Europe is clearly evident in the 1984 doctrine as it was in the doctrinal manuals of the 1970s. One of the reasons for attacking an enemy's warfighting potential is "to deny him the time and space to employ his forces effectively. This involves coordinated attacks against an enemy's warfighting potential not yet engaged and attacks against an enemy's forces in contact."[126] Because the effects of strategic attacks may not immediately affect enemy troops in battle, "an air commander must exploit the devastating firepower of airpower to disrupt that momentum and place an enemy's surface forces at risk. To do that, an air commander must attack not only those enemy forces in contact, but

enemy forces in reserve or rear echelons as wel1."[127] Attacking and destroying these rear echelon targets "will generate stresses and strains on the enemy by limiting his mobility, disrupting his scheme of operation, and depleting his resources."[128] This concept of operations was in perfect harmony with the AirLand Battle doctrine developed for the NATO theater.

This version of Air Force doctrine has brought strategic airpower back into focus, but not entirely because of efforts to tie it directly to the battlefield. As mentioned earlier the need may arise where strategic airpower has to be applied independently of battlefield objectives because of the nature of the war and US aims. However, there seems to be a resuscitation of strategic airpower because the doctrine does not equate it with only nuclear warfare. The 1984 version of Air Force doctrine represented a vast improvement over earlier versions because of its attempts to balance strategic and tactical applications of airpower.

The doctrine influencing the Air Force beginning the 1990s continued the general nature of the 1975 procurement program. During the 3 year window 1989-1991 (Table 14), fighters dominated procurement with F-15s and F-16s comprising 68 percent of the total program. TAC was continuing to secure large numbers of new aircraft at the expense of other commands. Heavy bombers were procured in anticipation of a large Air Force buy of

TABLE 14
AIRCRAFT PROCUREMENT PROGRAMS FY 89-91[129]

Aircraft	# Acft
1. F-16A/B/C/D	438
2. CAP Aircraft	114
3. F-15A/B/C/D/E	108
4. TTB Trainer	43
5. MH-60G	33
6. C-130H (ANG)	12
7. AC-130U (SOF)	11
8. C-27A	10
9. C-17	8
10. B-2A	11
11. MC-130H (SOF)	6
12. C-20A	2
13. HC-130H	1
14. C-137E	1
TOTAL	800

stealth B-2A aircraft, but their numbers were eventually limited to 20. Other aircraft procured included cargo (in anticipation of a large C-17 buy) and special operations aircraft, but by far procurement emphasis was on fighters.

Conclusion

During the period 1960 to 1990 the Air Force pendulum has swung from long range heavy bombers to fighters with expected changes in leadership, force structure, and doctrine—a shift in culture. Figures 4, 5, and 6 provide a brief recap of the cultural conversion. In 1960 the bomber culture controlled the Air Force; in 1975 a transformation was taking place, and by 1990 a shift to fighters had been consummated for some time. SAC's aircraft numbers declined dramatically from 1960 to 1975 and then modestly until 1990 while TAC's fighter inventory remained relatively stable. Bomber procurement has remained modest in contrast to fighters, perhaps an indication of the bomber's relevance to doctrine in conventional and nuclear war.

FIGURE 4

AIRCRAFT EXPERIENCE OF AIR FORCE LEADERS

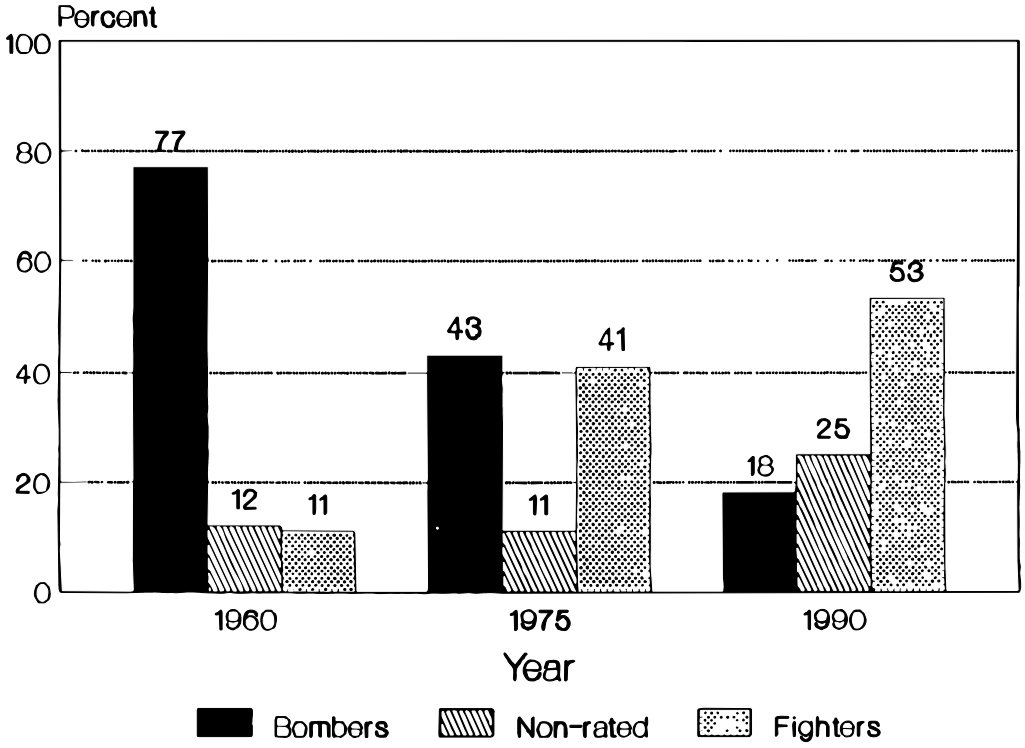


FIGURE 5

AIRCRAFT BY COMMAND

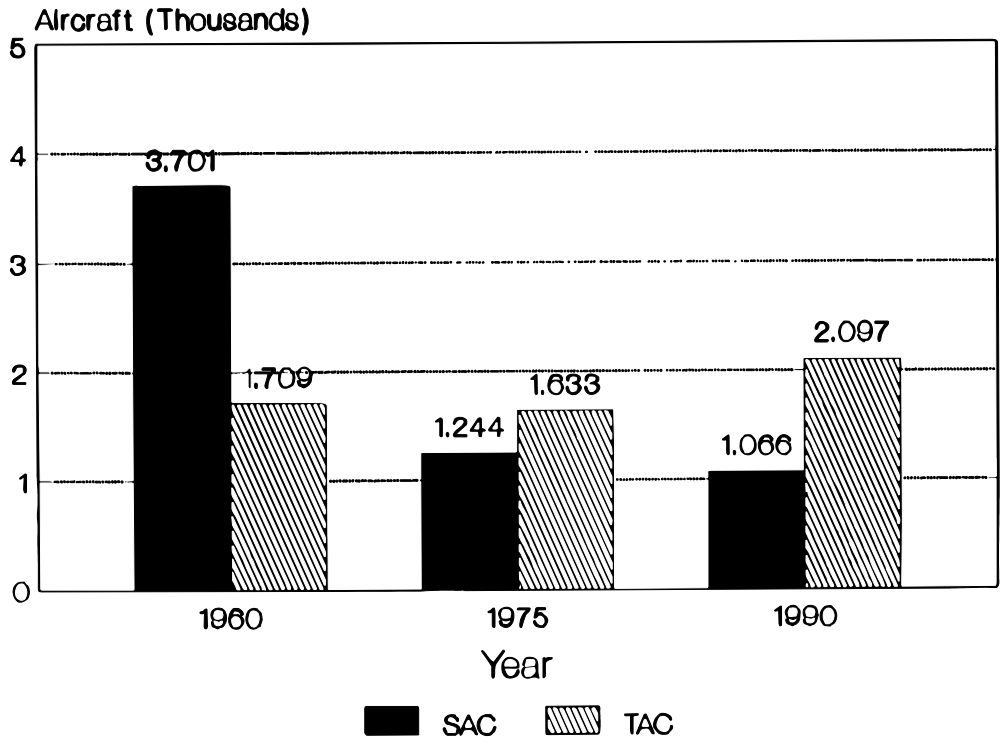
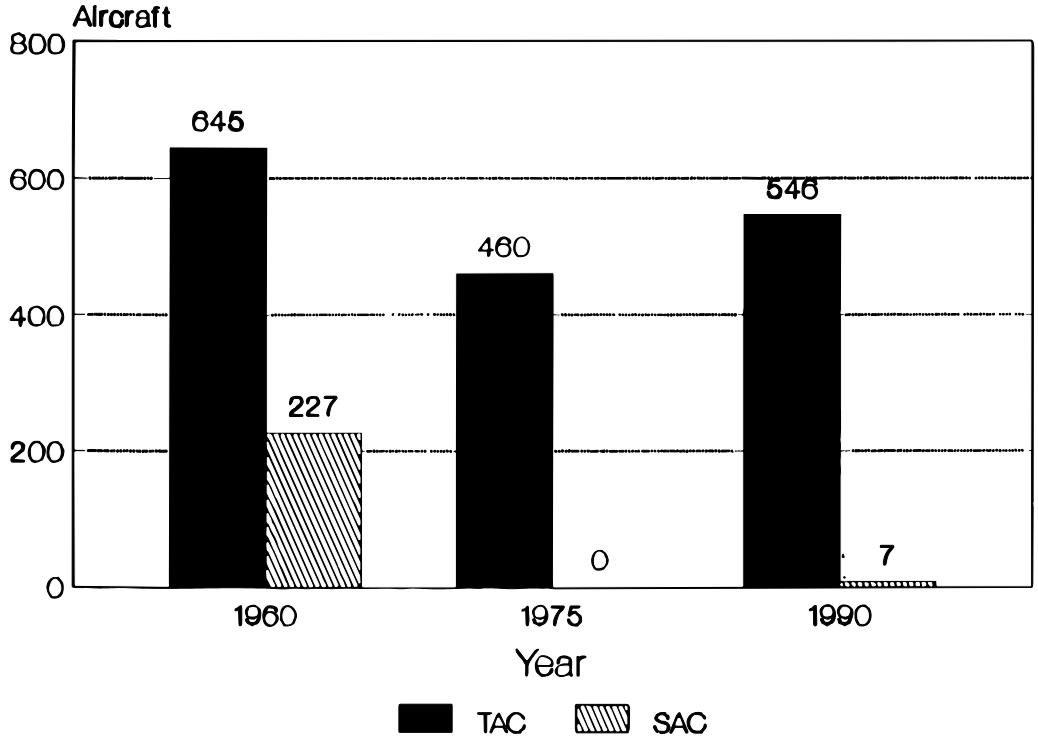


FIGURE 6

AIRCRAFT PROCUREMENT



CHAPTER 6

CONCLUSIONS

The Air Force was created upon the foundation of strategic airpower. For the first decade of its existence, it thrived on the need for strategic airpower to support a US national strategy of massive retaliation. Long range heavy bombers were the preeminent delivery platform for nuclear weapons until technology and the experience of Vietnam combined to usher in their decline. The ensuing dearth of emphasis on conventional strategic airpower was manifested in AirLand Battle doctrine where the Air Force seemed preoccupied with theater conventional warfare that primarily supported the Army in Europe.

Desert Storm brought the limelight back to conventional strategic airpower, achieving national objectives outside the scope of theater operations and exorcising the ghosts of Vietnam and Korea. The enduring principle of airpower indivisibility was again reinforced as F-117s (really B-117s) flew strategic bombing missions in Baghdad while B-52s flew tactical breech sorties on the front lines. This gives credence to the notion there are not any fighters or bombers, just airplanes carrying out strategic or tactical missions. The indivisible application of airpower—strategic, tactical, or both—can be decisive in war.

Desert Storm proved the essence of airpower has not changed. Missions such as bombs on target, personnel and cargo movement, air-to-air engagements, and air refueling will always reflect the essence of airpower. TAC, as in Vietnam, coopted SAC's traditional mission of strategic bombing in Desert Storm with outstanding results, providing further evidence of the value of indivisible airpower. This lesson must not be forgotten when the question of an air campaign surfaces in the next conventional war.

If the Air Force is to reap the full benefits of indivisible airpower then it should refrain from favoring one application or weapon system. During the 1950s when SAC was dominant,

tactical airpower was considered too dependent on the Army to contribute anything substantial to the independent mission of the service—strategic bombing. During the 1980s TAC believed strategic bombing was associated with aging B-52s and new B-1Bs, and not applicable to the conventional European theater. Each command's myopic beliefs dominated the service at the expense of indivisible airpower. Perhaps if there is a lesson to be learned from the shift in culture it is the importance of understanding airpower and its applications. It should not matter who runs the Air Force as long as they understand the full potential of airpower—strategic as well as tactical.

The bomber and fighter cultures both succumbed to the fallacy of believing the superiority of one form of airpower for guiding procurement, doctrine, and selecting top leadership. The bomber culture emphasized procurement of long range heavy bombers, the revered heritage of strategic bombing, and the qualification of combat experience in bombers to gain top commands. The fighter culture believed in the efficacy of purchasing fighters to gain and maintain air superiority over the battlefield, the decisiveness of tactical airpower, and the prerequisite of fighter combat experience to achieve top leadership positions. The fluid nature of airpower requires the utmost in efforts to avoid compartmentalizing and prioritizing applications to reflect the culture in power.

Theoretically, the relationship between Air Force culture and conventional strategic airpower should be constant, especially with regard to an air campaign. Depending on political objectives and constraints, strategic airpower mayor may not be the preferred means for executing military strategy, however, equal consideration of strategic and tactical airpower will encourage a more comprehensive approach to its applications. Airpower and its various roles are precious commodities that should not be diluted by any service wearing cultural blinders.

Unfortunately, as we have seen, the relationship between Air Force culture and

conventional strategic airpower has not been stable. The same case can be made for tactical. airpower. Thus, every effort and consideration should be given to realizing the implications and visualizing the full potential of airpower in future scenarios with shrinking force structures. Only in this manner can the essence of airpower be realized and appreciated across the broad spectrum of potential conflict.

ENDNOTES

1. Air Force Manual 1-1, Volume I, Basic Aerospace Doctrine of the United States Air Force, March 1992, (Washington, D.C.: Department of the Air Force), 7. This manual uses the term aerospace power rather than airpower to emphasize the fact that the Air Force operates in the air and space environments. For the purposes of this paper, airpower is used to denote those roles and missions that take place in the atmosphere rather than space.
2. Ibid.
3. Ibid.
4. Ibid.
5. Ibid.
6. Ibid., 11.
7. Harry H. Ransom, "Trenchard of the RAF," Air Force Magazine (May 1956): 98.
8. Sir H. M. Trenchard, Air Marshal, "Aspects of Service Aviation," The Army Quarterly Volume II Number 1 (April 1921): 19-20.
9. Ibid., 20.
10. Andrew Boyle, Trenchard, (London: Collins, 1962), 186.
11. Ransom, "Trenchard of the RAF," 98.
12. Harry H. Ransom, "Lord Trenchard, Architect of Air Power," Air University Quarterly Review Volume VIII Number 3 (Summer 1956): 64.
13. Giulio Douhet, The Command Of The Air, trans. Dino Ferrari (New York: Coward-McCann, Inc., 1942; repr., Washington, D.C.: Office of Air Force History, 1983), viii. Richard H. Kohn and Joseph P. Harahan have written an editor's introduction that provides an excellent summary of Douhet's ideas.
14. Ibid., 126. This information comes from Part II of the book, added to the original book in 26.
15. Ibid., 53.
16. Ibid., 117.
17. Ibid.
18. Ibid., 24.
19. Ibid., 98.
20. Robert Frank Futrell, Ideas, Concepts, Doctrine: Basic Thinking in the Air Force 1907-1960, Volume I, (Maxwell AFB, AL: Air University Press, 1989), 22.
21. Ibid.
22. William Mitchell, Brigadier General, Our Air Force, (New York: E. P. Dutton & Company, 1921), xix-xx.
23. Ibid., 15.
24. William Mitchell, Winged Defense, (New York and London: G. P. Putnam's Sons, 1925; reissued Port Washington, New York and London: Kennikat Press, 1971), 216-217.
25. Ibid.
26. Ibid., 123.
27. Barry D. Watts, The Foundations of US Air Doctrine, (Maxwell AFB, AL: Air University Press, 1984), 9.
28. Alfred F. Hurley, Billy Mitchell Crusader for Air Power (New York: Franklin Watts, Inc., 1964), 111.
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30. Futrell, Ideas, Vol .I, 53.

31. Hurley, Billy Mitchell, 128.
32. Haywood S. Hansell, Jr., The Air Plan That Defeated Hitler, (Atlanta: Higgins-McArthur/Longino & Porter, Inc., 1972), 12.
33. Ibid., 19.
34. Ibid.
35. Ibid.
36. Ibid.
37. Ibid., 22.
38. David MacIsaac, Strategic Bombing in World WarTwo: The Story of the United States Strategic Bombing Survey, (New York and London: Garland, 1976), 7. This doctrine was founded upon three basic tenets described in Haywood Hansell's book The Air Plan That Defeated Hitler, page 40:

1. Modern great powers are dependent upon mechanization and industrialization both for the conduct of war and for the preservation of great power status. Thus, destruction of carefully selected elements of the industrial system could paralyze war-supporting industry and vitiate the capability to wage effective warfare.
2. Bombs were available or could be built which if properly placed would destroy any man-made structure. Such bombs could be delivered from the air with adequate accuracy.
3. In the current relationship between the powers of the bomber and the defending fighter, it was considered that offensive air forces could use speed, initiative, deception, altitude, defensive formations and gunfire to penetrate air defenses and reach vital interior targets without incurring intolerable losses. If, however, enemy air defenses seemed likely to induce unacceptable losses, the enemy fighter forces would have to be weakened by air attack and air combat, as a preliminary or "intermediate" step.

The problem of bomber vulnerability to fighters would haunt the ACTS during World War Two.

39. Hansell, The Air Plan, 24.
40. Ibid., 18.
41. Ibid.
42. Futrell, Ideas, Vol I, 80.
43. Ibid.
44. Haywood S. Hansell, Jr., The Strategic Air War Against Germany and Japan, (Washington, D. C.: Office of Air Force History, 1986), 17.
45. Ibid., 18.
46. Ibid., 30.
47. Ibid., 31.
48. Ibid., 34.
49. Ibid., 35.
50. Ibid., 37. For a breakout of aircraft, see page 39. It is interesting to note that AWPD-1 does call for the production of 2,000 fighters for escort duties.
51. Futrell, Ideas, Vol I, 109.
52. R. J. Overy, The Air War 1939-1945, (Chelsea, MI: Scarborough House Publishers, l980), 63.
53. Ibid., 58.

54. Ibid., 60.
55. Ibid.
56. Michael S. Sherry, The Rise Of American Air Power The Creation of Armageddon, (New Haven, CT: Yale University Press, 1987), 120.
57. Makers of the United States air Force, Edited by John L. Frisbee, (Washington, D.C.: Office Of Air Force History, United States Air Force, 1987), 70.
58. Thomas A. Fabyanic, Strategic Air Attack In The United States Air Force: A Case Study, (Manhattan, KS: Military Affairs/Aerospace Historian), 74.
59. Overy, The Air War, 73.
60. Futrell, Ideas, Vol I, 150.
61. Sherry, American Air Power, 148.
62. Overy, The Air War, 75.
63. Futrell, Ideas, Vol I, 150.
64. The United States Strategic Bombing Surveys, Reprint, (Maxwell AFB, AL: Air University Press, 1987), 5.
65. Ibid., 6.
66. Ibid., 37.
67. Ibid., 38.
68. Robert F. Futrell, Dr., "Tactical Employment of Strategic Air Power in Korea," Airpower Journal (Winter 1988): 31.
69. "The Strategic Bomber," Air University Quarterly Review, Volume VIII Number 1 (Summer 1955): 120.
70. Otto P. Weyland, General, USAF, "The Air Campaign In Korea Air University Quarterly Review, Volume VI Number 3 (Fall 1953): 28.
71. Air War College, "Korean Targets For Medium Bombardment," Air University Quarterly Review, Volume IV Number 3 (Spring 1951): 31.
72. Futrell, Ideas, Vol I, 349.
73. Air War College, "Korean Targets For Medium Bombardment," 31.
74. Robert Endicott Osgood, Limited War, (Chicago: The University of Chicago Press, 1957), 211.
75. Frank T. Hines, "Air Refueling: Its Evolution, History and Role in Sea," (A Special Report for Project CORONA HARVEST, Air Command and Staff College, Air University, 1970), 1.
76. Ibid.
77. Ibid., 2.
78. Ibid.
79. Ibid.,8.
80. Ibid., 9-10.
81. Ibid., 49.
82. U.S. Congress, House, Committee On Armed Services, Subcommittee Number Two, Department Of Defense Decision To Reduce The Number And Types Of Manned Bombers In Strategic Air Command, (89th Congress, 2d session, 25-28 January and 1-2 February 1966), 6081.
83. Ibid., 6083-6084.
84. Mark Clodfelter, The Limits of Air Power, The American Bombing of North Vietnam, (New York: The Free Press, 1989), 157.
85. Ibid., 201.

86. Tidal W. McCoy, "'Full Strike'—The Myths and Realities of AirLand Battle," Armed Forces Journal International (June 1984): 82.
87. Jon S. Powell, "AirLand Battle: The Wrong Doctrine for the Wrong Reason," Air University Review Volume XXXVI Number 4 (May-June 1985): 15.
88. Ibid., 16.
89. Ibid.
90. Robert D. Russ, General, USAF, "The Air Force, the Army and the Battlefield of the 1990s," Defense 88 (July/August 1988): 12-13.
91. Millard Barger, "What USAF Has to Do to Put the "Air" in AirLand Battle," Armed Forces Journal International (June 1986): 58.
92. Russ, "Battlefield," 12.
93. Strategic Air Command, Edited by Norman Polmar, (Annapolis, MD: Nautical and Aviation Publishing Company of America, Inc.), 66.
94. Ibid., 225.
95. Strategic Air Command, 67.
96. United States Air Force Statistical Digest Fiscal Year 1960, Fifteenth Edition, (Washington, D.C.: Directorate of Data systems and Statistics, Comptroller of the Air Force, Headquarters, USAF): 74. This table does not include Air Force Reserve (771 aircraft) and Air National Guard (2,269 aircraft). The scope of this research project requires only aircraft data for the active Air Force. It is interesting to note that most of these aircraft were fighters providing increases in airframes for TAC and Air Defense Command (ADC) without any increase in organizational influence because the forces were not considered regular.
97. Ibid., 72.
98. USAF Statistical Digest 1960, 206 and 208. Includes overseas personnel. Commands that had personnel overseas and stateside have been combined. The figures for officers include warrant officers.
99. Air Force Manual 1-2 United States Air Force Basic Doctrine, l December 1959, (Washington, D.C.: Department of the Air Force) 3.
100. Ibid.
101. Ibid., 4.
102. Ibid., 9.
103. Ibid., 11.
104. Ibid.
105. United States Air Force Statistical Digest Fiscal 1961, Sixteenth Edition, (Washington, D.C.: Directorate of Data Systems and Statistics, Comptroller of the Air Force, Headquarters, USAF): 75-76. Rather than examining FY 1960 alone, a three year window (59-61) is presented. This is to preclude any anomalies in procurement data for a given year due to production economies of scale. The data in the table represent the total number purchased for a given aircraft in the three year window.
106. Strategic Air Command, 137.
107. USAF Program PA 77-4 Vol II Aerospace Vehicles And Flying Hours (U) Vol II Aircraft and Flying Hours By Command 1 October 1975, (Washington, D.C.: Deputy Chief of Staff for Programs and Resources, Headquarters, USAF) 5-264. This table does not include Air Force Reserve (448), Air National Guard (1,647), and Republic of Vietnam, Air Force (243) aircraft which would bring the total to 9,577 aircraft. The scope of this research project requires only aircraft data for the active Air Force.

108. United States Air Force Statistical Digest Fiscal Year 1975, Thirtieth Edition, (Washington, D.C.: Directorate of Data Systems and Statistics, Comptroller of the Air Force, Headquarters, USAF): 62. Does not include Air National Guard, Air Force Reserve, and Support-to-Other-Nations aircraft.
109. USAF Statistical Digest 1975, 111-114. Includes overseas personnel. Commands that had personnel overseas and stateside have been combined. The figures for officers include warrant officers.
110. Ibid., 249.
111. Air Force Manual 1-1 United States Air Force Basic Doctrine, 15 January 1975, (Washington, D.C.: Department of the Air Force), 1-1.
112. Ibid., 3-2 and 3-5.
113. Ibid., 3-5.
114. USAF Statistical Digest 1975, 55 and United States Air Force Statistical Digest Fiscal Year 1976, Thirty-First Edition, (Washington, D.C.: Directorate of Data Systems and Statistics, Comptroller of the Air Force, Headquarters, USAF): 83. Again total procurement for each aircraft in a three year window is presented to preclude any anomalies in procurement data.
115. USAF Program Aerospace Vehicles And Flying Hours Aircraft and Flying Hours By Command (U) Vol II FY 92-97 POM 30 April 1990, (Washington, D.C.: Air Force Director of Programs & Evaluation) 5-247. This table does not include Air Force Reserve (497 aircraft) and Air National Guard (1,751 aircraft). The scope of this research project requires only aircraft data for the active Air Force.
116. United States Air Force Statistical Digest Fiscal Year 1992/1993 Estimate, (Washington, D.C.: Deputy Assistant Secretary Cost and Economics, Assistant Secretary of the Air Force Financial Management and Comptroller of the Air Force Headquarters, USAF): E2. Excludes Air National Guard and Air Force Reserve aircraft.
117. USAF Statistical Digest 1992/1993 Estimate, D5.
118. Secretary of the Air Force (SAF/FMBOI). Budget execution data faxed to School of Advanced Airpower Studies. Fax number 84933015;# 1/12, 5 March 1992.
119. Air Force Manual 1-1 Basic Doctrine of the United States Air Force, March 1984, (Washington, D.C.: Department of the Air Force), 1-3.
120. Ibid., 2-10.
121. Ibid., 2-10 and 2-11.
122. Ibid., 2-11.
123. Ibid.
124. Ibid.
125. Ibid., 2-12.
126. Ibid., 2-13.
127. Ibid.
128. Ibid., 2-14.
129. United States Air Force Statistical Digest (Abridged) Fiscal Year 1991 Estimate, (Washington, D.C.: Deputy Assistant Secretary (Cost and Economics), Assistant Secretary of the Air Force (Financial Management and Comptroller of the Air Force): E-5. USAF Statistical Digest (Abridged) Fiscal Year 1992/1993 Estimate, E-5. Table 12 represents the total number of each aircraft purchased in the three year window 89-91.

APPENDIX 1

AIRCRAFT EXPERIENCE OF AIR FORCE LEADERS IN 1960

Staff*

Bombers

1. Office of Legislative Liaison—Maj Gen Thomas C. Musgrave, Jr.
2. Chairman of the Joint Chiefs of Staff—Gen Nathan F. Twining
3. North American Air Defense Command CINC—Gen Laurence S. Kuter
4. Supreme Allied Commander Europe—Gen Lauris Norstad
5. Alaskan Air Command CINC—Lt Gen Frank A. Armstrong
6. Chief of Staff—Gen Thomas D. White
7. Vice Chief of Staff—Gen Curtis E. Lemay
8. Asst Vice Chief of Staff—Maj Gen Richard M. Montgomery
9. Asst Chief of Staff, Intelligence—Maj Gen James H. Walsh
10. Asst Chief of Staff, Reserve Forces—Maj Gen Robert E. L. Eaton
11. Comptroller of the Air Force—Lt Gen William D. Eckert
12. Deputy Chief of Staff, Development—Lt Gen Roscoe C. Wilson
13. Deputy Chief of Staff, Personnel—Lt Gen Truman H. Landon
14. Deputy Chief of Staff, Plans & Programs—Lt Gen John K. Gerhart

Non-rated

1. Asst Chief of Staff, Guided Missiles—Brig Gen Milton B. Adams
2. The Surgeon General—Maj General Oliver K. Niess
3. The Inspector General—Lt Gen Joseph F. Carroll
4. The Judge Advocate Genera1—Maj Gen Albert M. Kuhfeld

Fighters

1. Deputy Chief of Staff Materiel—Lt Gen Mark E. Bradley, Jr.
2. Deputy Chief of Staff Operations—Lt Gen Dean C. Strother

APPENDIX 1 (Continued)

Major Commands

Bombers

1. Air Defense Command—Lt Gen Joseph H. Atkinson
2. Air Training Command—Lt Gen James E. Briggs
3. Air Research & Development Comd—Lt Gen Bernard A. Schriever
4. Air Materiel Command—Gen Samuel E. Anderson
5. Military Air Transport Service—Lt Gen Joe W. Kelly, Jr.
6. Headquarters Command—Maj Gen Brooke E. Allen
7. Alaskan Air Command—Maj Gen Conrad F. Necrason
8. Caribbean Air Command—Maj Gen Leland S. Stranathan
9. Air University—Lt Gen Walter E. Todd
10. USAF Security Service—Maj Gen Millard Lewis
11. Strategic Air Command—Gen Thomas S. Power
12. Pacific Air Forces CINC—Gen Emmett O'Donnell, Jr.
1.3. Continental Air Command—Lt Gen William E. Hall

Fighters

1. US Air Forces in Europe CINC—Gen Frederic H. Smith, Jr.
2. Tactical Air Command—Gen Frank F. Everest

* Includes 4 star generals in joint positions.

Information on Air Force organization obtained from Air Force and Space Digest, Volume 43, Number 9, September 1960, and the United States Air Force Statistical Digest Fiscal Year 1960, Fifteenth Edition, (Washington, D.C.: Directorate of Data Systems and Statistics, Comptroller of the Air Force, Headquarters, USAF). Information on individuals obtained from USAF biographies, unit histories and oral interviews.

APPENDIX 2

AIRCRAFT EXPERIENCE OF AIR FORCE LEADERS IN 1975

Staff*

Bombers

1. Chairman, Joint Chiefs of Staff—Gen George S. Brown
2. Dep CINC, US European Command—Gen Robert E. Huyser
3. Chief of Staff, SHAPE—Gen Louis T. Seith
4. Chief of Staff—Gen David C. Jones**
5. Vice Chief of Staff—Gen William V. McBride
6. Asst Vice Chief of Staff—Lt Gen Marion L. Boswell
7. Asst Chief of Staff Intelligence—Maj Gen George J. Keegan, Jr.
8. The Judge Advocate General—Maj Gen Harold R. Vague
9. Director, Air National Guard— Maj Gen John J. Pesch **
10. Comptroller of the Air Force—Lt Gen Charles E. Buckingham
11. Dep Chief of Staff, Programs & Resources—Lt Gen James A. Hill
12. Dep Chief of Staff, Plans & Operations—Lt Gen John W. Pauly
13. Dep Chief of Staff, Systems & Logistics—Lt Gen Robert E. Hails

Non-rated

1. Asst Chief of Staff, Studies & Analysis—Brig Gen Jasper A. Welch, Jr.
2. Chief, Air Force Chaplains—Maj Gen Henry J. Meade
3. The Inspector General—Lt Gen Donald G. Nunn
4. Surgeon General—Lt Gen George E. Schafer

Fighters

1. Chief of Staff—Gen David C. Jones**
2. Director, Office of Legislative Liaison—Maj Gen Ralph J. Maglione
3. Director, Office of Information—Maj Gen Guy E. Hairston, Jr.
4. Director, Air National Guard—Maj Gen John J. Pesch**
5. Deputy Chief of Staff, Personnel—Lt Gen Kenneth L. Tallman
6. Deputy Chief of Staff, Research & Development—Lt Gen Alton D. Slay

Airlift

1. Chief of Air Force Reserve—Maj Gen William Lyon
2. Chief, Security Po.1ice—Maj Gen Thomas M. Sadler

APPENDIX 2 (Continued)

Major Commands

Bombers

1. CINC US Air Forces in Europe—Gen Richard H. Ellis
2. Military Airlift Command—Gen Paul K. Carlton
3. Pacific Air Forces—Gen Louis L. Wilson, Jr.**
4. Strategic Air Command—Gen Russell E. Dougherty
5. Air Force Communications Service—Brig Gen Rupert H. Burris

Fighters

1. Aerospace Defense Command—Gen Daniel James, Jr.
2. Air Force Logistics Command—Gen F. Michael Rogers
3. Air Force Systems Command—Gen William J. Evans
4. Tactical Air Command—Gen Robert J. Dixon
5. Air Training Command—Lt Gen John W. Roberts
6. Alaskan Air Command—Lt Gen James E. Hill
7. Pacific Air Forces—Gen Louis L. Wilson, Jr.**
8. US Air Force Security Service—Brig Gen Kenneth D. Burns
9. Air University—Lt Gen Raymond B. Furlong
10. Headquarters Command, USAF—Brig Gen William C. Norris
11. US Air Forces Southern Command—Maj Gen James M. Breedlove

* Includes 4 star generals in joint positions.
** These individuals had extensive bomber and fighter experience, thus each were counted in both groups as one-half.

Information on Air Force organization obtained from Air Force Magazine, Volume 58, Number 9, September 1975, and United States Air Force Statistical Digest Fiscal Year 1975, Thirtieth Edition, (Washington, D.C.: Management Information Division, Directorate of Management Analysis, Comptroller of the Air Force, Headquarters, USAF). Information on individuals obtained from USAF biographies, unit histories and oral interviews.

APPENDIX 3

AIRCRAFT EXPERIENCE OF AIR FORCE LEADERS IN 1990

Staff*

Bombers

1. CINC, North American Aerospace Command—Gen Donald J. Kutyna**
2. Deputy Commander in Chief US European Command—Gen James P. McCarthy **
3. Chief of Staff, SHAPE NATO—Gen John A. Shaud**
4. Director, Legislative Liaison—Brig Gen Brett M. Dula
5. Assistant Vice Chief of Staff—Lt Gen Carl R. Smith
6. Military Asst to the Sec of the Air Force—Brig Gen David W. McIlvoy
7. Commander, Air Forces District of Washington—Brig Gen James L. Vick**

Non-rated

1. Director of Public Affairs—Brig Gen H. E. Robertson
2. Asst Chief of Staff Cmnd, Cntr1, Comm, & Comp—Maj Gen Albert J. Edmonds
3. Assistant Chief of Staff Intelligence—Maj Gen James R. Clapper, Jr.
4. Chief of Air Force Chaplains—Maj Gen John P. McDonough
5. The Judge Advocate General—Maj Gen Keithe E. Nelson
6. Surgeon General—Lt Gen Monte B. Miller

Fighters

1. Chief of Staff—Gen Michael J. Dugan
2. Vice Chief of Staff—Gen John M. Loh
3. Director, Air National Guard—Maj Gen Philip G. Killey
4. The Inspector General—Lt Gen Bradley C. Hosmer
5. Assistant Chief of Staff, Studies & Analyses—Maj Gen George B. Harrison
6. Chief of Air Force Reserve—Maj Gen Roger P. Scheer
7. Commander, Air Forces District of Washington—Brig Gen James L. Vick**
8. Deputy Chief of Staff, Programs & Resources—Lt Gen Robert L. Rutherford
9. Deputy Chief of Staff, Plans & Operations—Lt Gen Thomas J. Hickey
10. Deputy Chief of Staff, Log & Engineering—Lt Gen Henry Viccellio, Jr.
11. Principal Dep Asst to Sec AF for Acquisition—Lt Gen John E. Jaquish
12. CINC, North American Aerospace Command—Gen Donald J. Kutyna**
13. Deputy Commander in Chief US European Command—Gen James P. McCarthy**
14. Chief of Staff, SHAPE NATO—Gen John A. Shaud**

APPENDIX 3 (Continued)

Major Commands

Bombers

1. Air Force Logistics Command—Gen Charles C. McDonald
2. Military Airlift Command—Gen H. T. Johnson***

Non-rated

1. Air Force Communications Command—Maj Gen Robert H. Ludwig
2. Air Force Space Command—Lt Gen Thomas S. Moorman, Jr.
3. Electronic Security Command—Maj Gen Gary W. O'Shaughnessy

Fighters

1. Air Force Systems Command—Gen Ronald W. Yates
2. Air Training Command—Lt Gen Joseph W. Ashy
3. Air University—Lt Gen Charles G. Boyd
4. Pacific Air Forces—Gen Merrill A. McPeak
5. Strategic Air Command—Gen John T. Chain, Jr.
6. Tactical Air Command—Gen Robert D. Russ
7. US Air Forces in Europe—Gen Robert C. Oaks

Airlift

1. Air Force Special Operations Command—Maj Gen Thomas E. Eggers
2. Military Airlift Command—Gen H. T. Johnson***

* Includes four star generals in joint positions.

** These individuals had extensive bomber and fighter experience, thus each were counted in both groups as one-half.

*** This individual had extensive bomber and airlift experience, thus was counted in both groups as one-half.

Information on Air Force organization obtained from Air Force Magazine, Volume 73, Number 9, September 1990, and United States Air Froce Statistical Digest Fiscal Year 1992/1993 Estimate, (Washington, D.C.: Deputy Assistant Secretary Cost and Economics, Assistant Secretary of the Air Force Financial Management and Comptroller of the Air Force, Headquarters, USAF). Information on individuals obtained from USAF biographies, unit histories and oral interviews.

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