SCHOOL OF ADVANCED AIRPOWER

Aerospace Doctrine Matures Through A Storm: An Analysis of the New AFM 1-1

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ABSTRACT

TITLE: Aerospace Doctrine Matures Through A Storm: An Analysis of the New AFM 1-1.

In March 1992, the Air Force published a new Air Force Manual 1-1, Basic Aerospace Doctrine of the United States Air Force. This document is not merely an update of previous editions. Instead, it is a statement of propositions concerning the use of aerospace power set within the context of war, and based on explicit analysis of historical and contemporary experience. Its intent is to provide guidance for the exercise of professional judgement by all aerospace leaders.

This thesis is intended to provide a framework for examining this new doctrine. It traces the heritage of aerospace power and examines the history and theory behind Air Force doctrine. It then evaluates how well this new manual explains aerospace power's role in Desert Storm and assesses the implications of the doctrine necessary for the future joint use of aerospace forces.

The research question asks how well this new AFM 1-1 provides the basic guidelines needed for using aerospace power in a theater-level conventional war such as Desert Storm. Unclassified material relating to the history of aerospace doctrine, aerospace performance in Desert Storm, and other service doctrine regarding aerospace power's use, are investigated. The conclusion is that the March 1992 version of AFM 1-1 provides a sound doctrinal basis for such conventional theater conflicts. This new summary of basic aerospace doctrine is also broad enough to assist in the development of joint aerospace doctrine as well.

BIOGRAPHICAL SKETCH

Lt Col Kurt A. Cichowski graduated from the United States Air- Force Academy and was commissioned a second lieutenant in the Air Force in June 1977. Following pilot training, he spent his early years as an undergraduate flight instructor prior to becoming an F-4 pilot in West Germany. While overseas, he also served as an air liaison officer to U.S. Army units at the brigade, division, and corps levels. Following this assignment, he became an F-16 pilot. While in Germany, he served as a member of the NATO Tactical Evaluation team and became experienced in several NATO aircraft. Lt Col Cichowski graduated from the United States Air Force's Air Command and Staff College in 1990 and instructed there the following year. He is currently a student at the Air Force School of Advanced Airpower Studies. He holds a bachelors degree in engineering sciences and a masters degree in business sciences.

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CHAPTER I

DOCTRINAL BEGINNINGS

Introduction

From the earliest hours in the midnight skies over Baghdad to the final apocalyptic-like moments on the Highway of Death, American aviators demonstrated why the United States has the premier air forces in the world. In just under 1000 hours, American units led a coalition force which wrested control of the air away from Iraq, destroyed the strategic military and industrial targets necessary to control and command Saddam Hussein's army, and provided an incessant bombardment that sapped the fighting capability and morale of the approximately half-million Iraqi soldiers deployed in Kuwait. When President George Bush met with his advisors in early February 1991, he determined that despite the uninterrupted Allied bombing, Iraqi leaders showed little sign of withdrawing from Kuwait. Since there was declining world-wide support for combat operations, and because air operations were rapidly approaching the point of diminishing returns, the last 100 hours of this six-week war saw aerospace forces used in a complementary role with the ground forces that stormed across the desert completing the destruction of the Iraqi Army.

While aircraft, weapons, and aircrews performed even better than predicted, the stunning achievements of aerospace power did not just happen. There was much prewar debate on whether the military as a whole, and the Air Force in particular, had the requisite doctrine needed for dealing with the theater-level threat the Iraqi army presented. The effective maturation and development of aerospace power requires the harmonious union of people, technology, and ideas. The purpose of this paper is to examine the new Air Force Manual (AFM) 1-1 basic doctrine, and see if the guidelines it provides are compatible with the insights gained from the

experience in Desert Storm.[1] This examination will begin by defining what doctrine is and what it encompasses. Next, the study explores the evolution of air power into aerospace power through World War II and the ensuing limited conflicts.[2] Subsequently, a description of the new AFM 1-1 and a critical evaluation of its contents follows. Finally, this new statement of doctrine, written largely before August 1990, will be studied in light of the experience of Desert Storm and speculations on the future implications of joint aerospace power's employment will be made. If discrepancies exist between these new guidelines and the insights gained from our most recent conflict, the contemporary relevance of this doctrinal statement will be open to serious question. Before these judgements can be made however, aerospace doctrine must first be defined.

Doctrine Defined

Doctrine is many things to many people. To some it is merely "what we believe, about the best way to do things."[3] Others feel it is an all-inclusive guide to "furnish the authoritative foundation for force design, material acquisition, professional education, and individual and unit training."[4] Still others say there is no such thing as doctrine. Efforts to define doctrine exactly are inherently fraught with difficulty.[5] As a working definition, Joint Chiefs of Staff (JCS) Publication 1-02 Dictionary of Military and Associated Terms (the official listing of Defense Department terminology), states doctrine is the "fundamental principles by which the military forces or elements thereof guide their actions in support of national objectives. It is authoritative but requires judgement in application."[6] This definition has at least two implications requiring closer examination.

First, doctrine seems to imply a set of guidelines for action. These guidelines describe the best way to employ the basic elements of military power and are the points of departure for the future implementation of plans and the employment of weapons and personnel. Second, since

doctrine is authoritative, it seems that it must be formally codified or sanctioned in order to meet this Joint Pub 1-02 definition. While this might at first seem a prohibitive restriction, to be usable, a set of guidelines must be understood by all. The Air Force recently saw doctrine as a common frame of reference that determines how to organize, train, equip, employ, and sustain its forces.[7] It is the way we insure everyone is "singing from the same sheet of music." More importantly, doctrine is also a basis for change. An essential non-stated corollary to these original implications is that doctrine must be flexible. It must be frequently reviewed and updated to allow for changes.[8] If we are to avoid fatal mistakes in the future, doctrinal innovation must be an ongoing phenomenon. This formalized set of guidelines is therefore based on experience, but must also keep an eye to the future.

Sources of Doctrine

Doctrine has two primary sources.[9] The first element is history. The analysis of past conflicts is a fundamental tool which needs to be employed in building new doctrine. An obvious benefit is that an analysis of past encounters is one way to avoid the mistakes of our predecessors. Because history has a way of not repeating itself, we should not blindly follow in our forefathers' footpaths. Rather, history is a source of experience used to broaden judgement and helps examine old ways to solve new problems.[10] Some airmen argue that 90 years of "air history" is an insufficient source from which to draw valuable lessons. However, there are valuable examples of the proper and improper uses of aerospace power in World War II, Korea, Vietnam, the South Atlantic War, and the various Middle East Conflicts. In addition, some lessons from the pre-aviation history of warfare have similar applicabilities in the air as those drawn from their original environments. Airmen must broaden their horizons and see how

lessons from aviation history, as well as sister service operations, might apply to their own doctrine.[11]

The second major element of doctrine is theory, or the intellectual thoughts and principles which form the basis for change and revision. Where history provides lessons to learn, theory should prevent large-scale mistakes from happening in the first place. There are some who believe that "the principal catalyst of doctrinal change is military disaster."[12] Theory should therefore help explain the lessons that history provides while at the same time anticipating the changes that the future will bring.[13] In this age of nuclear weapons, limited budgets, and decreasing American domestic support for international affairs, we no longer can afford the luxury of having time available to get our doctrine right.[14]

Previous Doctrines

American aerospace doctrine really had its beginnings in World War I. While the experiences gained in this conflict revealed aviation was capable of action as an offensive arm, the ground officer still saw it as an extension of the traditional means of communication and observation. One veteran infantry officer stated, "We discovered that airplanes could go faster and higher than horses.[15] In reality, while all the traditional missions of the air arm were accomplished (strategic bombardment, air interdiction, close air support, and air superiority), none of them decisively affected the conflict.[16] The resulting doctrine reflected airpower's subordinate role. Air Service Information Circular, Vol 1. 12 June 1920 states, "It is the role of the Air Service, as well as that of the other arms, to aid the chief combatant: the infantry."[17]

This secondary role remained in Air Service/Air Corps doctrine throughout the inter-war period. The early versions stated that the "first duty of the air force was to gain and hold control of the air." Having achieved this goal, the air mission then became "to destroy the most

important enemy forces on the surface. Success or failure of the infantry determined the success or failure of the army."[18] The 1935 version of Training Regulation (TR) 440-15 recognized that there should be some operations conducted by air forces operating independently of ground forces.[19] By 1940, American Army Air Corps doctrine still stated air assets employed in direct support of ground troops were essential. The idea of independent operations had grown. These missions now included "air operations outside the sphere of influence of surface forces, in order to conduct action against targets having "only an indirect bearing upon the tactical forces."[20] This shift was due to the thinking of airmen both in America and abroad.

World War I also produced the original airpower theorists. Brigadier General Giulio Douhet was the first to construct a coherent airpower philosophy.[21] His central premise was "To conquer the command of the air means victory."[22] To this first axiom, he added two corollaries: 1) In order to assure an adequate national defense, it is necessary and sufficient to conquer command of the air; 2) All that a nation does should, as its aim, procure the most effective means to command the air.[23] Douhet's second premise was that command of the air cannot be conquered except by an "adequate aerial force."[24] His third stated that this aerial force must be independent.[25] In other words, wars in the future would be won by the nation with the best air force used in the best manner. It is the targeting implications of Douhet's work which are of greatest relevance to this study however.[26]

Douhet argued that the targets for massed aerial attacks had shifted from direct attacks on the enemy army to attacks aimed at destroying the adversary's war sustaining capability. Appalled by the carnage in the trenches of World War I, Douhet looked to alternative means for victory. His The War of 19-- described how a belligerent of the future essentially wins a war in three days (some would argue one day) by bombing "supply depots, industrial plants,

warehouses, railroad centers, population centers, et cetera."[27] The object was to break down, as speedily as possible, the enemy population's will to fight. Attacking the national resistance directly, would make life intolerable for the populace.[28] The implication therefore, is that Douhet would target the enemy air force first, followed by industry and civilian centers, rather than the enemy's forces in the field. He would focus the attack on an enemy's will to resist rather than his means to resist.

American theorists were also beginning to think along these same lines by the end of the First World War. Lt Col William Sherman, Chief of Staff of the First Army Air Service, in the same 1917 memorandum which became Air Service Circular Number 1, identified how the object of an army is to defeat the enemy's armed forces in the field.[29] However, he also observed: "In war, practically never does victory come as a result of the material destruction of the enemy's forces. The final aim sought, [is] the destruction of the enemy's hope of victory, of his desire, in a word, of his morale."[30] While Sherman was only talking about military forces, the well-known proposals of Brigadier General William Mitchell paralleled those of Douhet. Mitchell felt that "the influence of airpower on the ability of one nation to impress its will on another in armed contest, will be decisive."[31] He asserted that nations were controlled by vital centers which were protected by a crust that attacking armies and navies had to fight their way through. The neutralization of these vital centers would render the adversary powerless. Airpower could bypass surface forces and strike directly at these targets. The enemy's armed forces were thus, "a false objective and the real objectives were the vita1 centers."[32]

Mitchell, acting upon his deep conviction that changes in military systems are brought about only through pressure of public opinion or disaster in war, was court-martialed for insubordination in 1925.[33] His ideas continued to grow. The Air Corps Tactical School (ACTS),

located first at Langley, Virginia, and then moved in 1931 to Maxwell Field, Alabama, was the only institution where Air Corps Officers had enough time for creative thinking.[34] This group of officers appeared to adopt, if not the whole of Mitchell's theory, at least his fundamental aspects. Lectures delivered at the school leave no doubt as to the thoroughness of this revolution in thought. The instructors taught an offensive type of warfare that ultimately was aimed at the enemy's will to resist. However, they felt a nation could be defeated by disturbing the delicate balance of the complex "industrial web." Therefore, the real target was industry itself, not national morale, since a disturbance in this intricate system would by itself wreck the enemy's will to resist.[35] Where FM 1-5 opened the door to independent, strategic bombing theory, the ACTS began to codify these theories into doctrine.

By 1941, American airmen had taken these theories and developed a fairly cogent doctrine. From Douhet came the idea of air attacks directed at other than the enemy's armed forces in the field. Mitchell added the idea of control of an adversary's vital centers as the means to attain victory. To this, the ACTS included two important, practical aspects. First, they realized the improbability of fighting a major war single-handedly. Lecture notes describe how "if we (the U.S.) were dragged into a war which had been precipitated by other great powers, we would inevitably find allies."[36] The second addition to this industrial web theory was the realization that "to disrupt an enemy's industry by bombardment requires more than random strikes at targets of opportunity."[37] Five possible applications of airpower evolved from ACTS teachings: 1) Direct attack on enemy armed forces; 2) Indirect attack of enemy armed forces by destroying the industrial elements which supplied them; 3) Direct air attack on the economic and social systems; 4) Direct attack on enemy social centers; 5) Strategic defense of ones own systems and centers.[38]

In January 1941, Anglo-American military staff conferences discussed required principles of cooperation should the U.S. become involved in World War II.[39] Known as the American-British Conversations - 1 (ABC-1), these talks assumed the U.S. would have the use of advanced airfields in England and went on to establish some strategic policy guidelines. In July 1941, President Franklin Roosevelt asked the Secretaries of War and Navy to prepare an estimate of the production requirements needed to defeat America's potential enemies in accordance with these conversations. These collectively became known as the War Plans Documents and the air requirements were contained in Annex 2Lieutenant Colonel Harold George, Chief of the Air War Plans Division, headed the group which developed the "Munition Requirements of the Army Air Forces for the Defeat of Our Potential Enemies." The short title of this section became known as AWPD-1.

The Air War Plans Division was initially staffed entirely by former ACTS instructors, and the theories they had developed into broad doctrine at Maxwell Field now listed specific targetsAWPD-1 was designed to paralyze German war production by destroying a limited number of strategic industries. The overall objectives were to "wage a sustained air offensive against German military power" and "support a final offensive, if it becomes necessary to invade the continent."[40] The plan initially called for the destruction of the German Air Force by bombing thirty aviation industrial targets prior to neutralizing a set of targets considered vital to Germany's continued war effort. The Luftwaffe was therefore an intermediate target since for both the invasion, as well as the bombing campaign, it would have to be defeated. As for the ultimate targets, 124 electric, transportation, and synthetic petroleum installations were selected.[41] Destruction of these targets would both end the German capability to resist, as well as crumble morale based upon the disintegration of the population's livelihood. In broadest outlines,

this doctrine was close to that of the British. The developers of AWPD-l also believed airpower alone could defeat Germany. However, where the British were forced to change their initial doctrine and revert to night area bombing operations, the American plan called for the precision bombing of only military targets.[42] The British practice was discussed by the Americans, but it was ruled out in favor of daylight, high altitude, precision bombing.[43]

AWPD-1 was completed before Pearl Harbor as a guide for both strategy and production. Once America entered the war, the newly formed Joint Chiefs of Staff refused to approve this plan as a basis for strategic operations. Pearl Harbor focused public attention away from Europe and drastically affected the force structure and requirements of AWPD-1The result was a new plan known as AWPD-4, Air Estimate of the Situation and Recommendations for the Conduct of the War.[44] Appearing on 15 Dec 1941, it advocated the United States give first concern to protecting the Western Hemisphere, Great Britain, and to sustaining the fighting men in the Philippines. Following these actions, an air offensive would be directed against the Axis powers in Europe.[45] The plan recommended the priority in war production be given to the Air Forces and that sea and ground forces should be allocated resources "in the light of their contributions to the Air Force mission."[46]

Meeting in Washington from 22 Dec 1941 to 14 Jan 1942, the Anglo-American Combined Chiefs of Staff ARCADIA Conference did not favor such an overriding priority on aircraft production. Instead, they felt a "victory program" calling for increases in air, land, and naval forces, as well as the manufacture of munitions in a sequence of limited schedules geared to successively approved operations, was more appropriate.[47] Accordingly, the combined staff planners accepted AWPD-1 with modifications rather than AWPD-4In January 1942, the

American Joint Staff approved of dispatching a force of bombers to England to "operate independently [but] in cooperation with the British Bomber Command."[48]

When German fighters proved to be more effective than anticipated and the German submarine campaign took a heavier toll than expected on Allied shipping, President Franklin D. Roosevelt issued a ca11 for "complete air ascendancy over the enemy" in August of 1942AWPD-42 was the result of the President's request and it became the requirements plan specifying the air needs necessary to carry out the operations suggested in AWPD-l.[49] AWPD-42 retained the basic structure of AWPD-l. Destroying the capability and will of Germany by attacking the war-supporting industries and economic systems, remained the central objective. The new targets still included the German air industry, transportation system, electric power system, and synthetic oil plants, but also added submarine yards, aluminum plants, and synthetic oil storage locations.[50] The Casablanca Conference of January 1943 then coordinated individual Allied air plans by joining them in a Combined Bomber Offensive (CBO)British and American bombers were to neutralize some seventy-six targets in six areas, in order to paralyze the Axis war effort.[51] It was hoped, in fact vehemently argued by air leaders, that bombing alone might end the war against Germany.[52] If not, destruction of these targets would help prepare for the eventual invasion.

AWPD-42 also advocated that a strategic air offensive against Japan would follow that of Germany. This same plan suggested eight major target systems which, when destroyed, would eliminate the capability and will of the Japanese to resist. These targets included many of the same ones identified in Germany.[53] The war against Japan was discussed at the Quadrant Conference in August 1943 and the Sextant Conference in November 1943.[54] The air plan resulting from these talks, much like the CBO, was called Project Matterhorn. It called for a

systematic precision bombing of seven target systems by B-29's operating out of China.[53] However, operations from Chinese bases proved logistically unsupportable, and air operations flown directly against the Japanese homeland on a large scale were delayed until airfields in the Mariana Islands were secured. The targets remained the same ones identified in Project Matterhorn.

The results of all these conferences were a set of beliefs codified into plans. These plans targeted both the capability and will of an enemy's ability to wage war. They were based on the premise that a country could be undermined by precision bombing of a crucial set of selected targets in the industrial web. These targets would be destroyed by high altitude, daylight attacks that would, by themselves, force surrender. The formulation of these plans and the selection of these targets were essentially done without reference to "sanctioned" doctrine. Air Corps Field Manual 1-5, Employment of Aviation of the Army (1940) was the current basic doctrinal manual. As such, air operations "beyond the sphere of action of the surface forces were undertaken only in furtherance of the strategic plan of the commander of the field forces."[56] While this air force could be construed as being a separate entity, it was under the command of the "commander of field forces" and most often was "attached to large territorial commands or tactical commands for the accomplishment of specific missions."[57] The primary document covering air doctrine was therefore contained in War Department Field Manual 31-35, Aviation in Support of Ground Forces.

FM 31-35 was heavily concerned with organization and stated aviation units would be specifically allocated to the support of ground units, and "will usually target what constitutes the most serious threat to the operations of the supported ground force.[58] Tied in "penny packets" to perceived ground unit needs, American airpower was divided into air armies directly supporting

each individual army division. It was soundly defeated, along with the associated ground units, at the Kasserine Pass in February 1943.[59] This defeat resulted in major organizational changes. Affecting both air and ground units, the reorganization primarily dealt with unifying the Allied effort and directing it from a central position of authority. Lt Gen Carl W. Spaatz became commander of the Northwest African Air Forces which included the Northwestern African Tactical Air Forces (NATAF) headed by Air Marshal Sir Arthur Coningham. Coningham scrapped the American air employment practices and imposed his own. Brig Gen Laurence Kuter, deputy commander for NATAF, brought these British ideas back to Washing- ton and the board convened to study the doctrinal implications of the Kasserine experience. The result was War Department Field Manual 100-20, Command and Employment of Air Power, published in July 1943.

The first section of FM 100-20 was set entirely in uppercase letters and stated "LAND POWER AND AIR POWER ARE CO-EQUAL AND INTERDEPENDENT FORCES, NEITHER IS AN AUXILIARY OF THE OTHER."[60] It prioritized air missions into air superiority followed by inter- diction and then close support. FM 100-20 officially replaced only FM 1-5, but in reality eclipsed FM 31-35 as well. The selection of strategic objectives was now the responsibility of the theater commander who in turn directed his desires to a separate strategic air force commander.[61] The aim of the strategic air forces was the defeat of the enemy nation with objectives found in the "vital centers of the enemy's lines of communication and important establishments in the economic system of the hostile country."[62] This manual became the formal doctrinal statement for the Army Air Force, and served as a guide for the American air plans.

Operation Pointblank was the U.S. portion of the CBO conducted against German

industrial capacity in 1943 and 1944American bombers had begun conducting missions against European targets in August 1942.[63] By March 1943, the attrition rate averaged between five and six percent.[64] The successful completion of twenty-five combat missions had a statistical probability of only twenty percent. Aircrew morale was not good.[65] In August 1943, air strategists decided to attack the factories in the city of Schweinfurt which produced forty-two percent of all the German ball bearings. Of the 376 bombers launched, sixty were lost.[66] On 14 October 1943, Schweinfurt was struck again. Although P-47's received newly-designed auxiliary fuel tanks, the bombers were still alone over Germany for over three hours. The total bomber losses in this second raid were over twenty-eight percent with sixty bomber crews missing.[67] It was apparent that daylight, unescorted bombing proved the bomber could get through, but the resulting attrition was unacceptable. These recent experiences resulted in a change in tactics. Soon P-47's had belly and wing auxiliary tanks allowing them to escort the bombers halfway across Germany. In January 1944, P-51's and P-47's could escort bombers to the Polish border, and attrition was reduced to an acceptable rate of three percent by March 1944.[68]

In Japan, there were other problems with the original doctrine. In November 1944, bombing missions began from the Marianas. Prior to March 1945, the planes released their bombs from approximately 30,000 feet, and less then ten percent were hitting the target.[69] A high altitude, high velocity wind (known today as the jet stream), combined with persistent cloud cover and a poor radar bombing system, did not permit precise bombing.[70] On 9 March 1945, General Curtis LeMay began flying night, low-level (7,000 -20,000 feet) attacks using incendiaries in an attempt to destroy the widely dispersed “cottage industry” used in Japan.[71] Fifteen square miles of Tokyo's most densely populated area were burned to the ground. Thereafter, urban area attacks were alternated with precision attacks directed against military and

industrial target sets. These attacks continued until August when atomic weapons brought an end to the conflict. Once again, the intent was to break both the capability and the will of the Japanese by aerial attacks alone. In both cases, the results of these strategic bombing campaigns were only qualified successes.

The War Department directed General Arnold, as the Commanding General of Army Air Forces, to make "a critical evaluation of the effectiveness of [our] air attacks" so that the United States might "employ air power to the attainment of maximum results during wars of the future."[72] The Air Staff requested a separate study on the effects of strategic bombing. In November 1944, President Roosevelt directed such a study be made and Mr. Franklin D'Olier became the chairman of the United States Strategic Bombing Survey (USSBS) for both the European and Pacific Theaters.[73] A total of 316 different USSBS reports were published by a committee consisting mostly of civilians. Because of the sheer volume of these reports and other information, many Air Force leaders felt "you could learn any damn lesson you want."[74] A natural result, according to Bernard Brodie, was the "divorcement of doctrine from military experience."[75] The trick became how to apply the correct lessons of war to an emerging military service's doctrine. Following World War II, air and surface leaders were united in their feeling that the Second World War was conducted by a combined arms team. While airpower may have tipped the scales toward victory, the conflict was won by a joint effort of air, sea, and land forces. Writing in Life magazine, General Carl Spaatz stated, "The war against Germany was fundamentally an infantry war supported by air power, much as the war against Japan was fundamentally a navy war supported by air."[76] However, Gen Spaatz went on to say, "There is no useful purpose in re-fighting these wars as the airmen might have wished to fight them."[77] In essence, airmen felt airpower could have been the decisive instrument of war, but it was not

given the opportunity to prove it. Despite poor intelligence, misidentification of targets, and diversion of air strength to other than strategic targets, Germany was left in chaos and Japan could not continue to wage war nor protect its people.[78] The implication was that even more could be expected from airpower in the future since weapons and equipment not available in this conflict would finally fulfill Douhet's expectations.[79]

Despite the history of World War II, airpower theory and corresponding doctrine was uneffected and the experiences of the conflict seemed to reinforce the instruction provided at ACTS. Concerning atomic weapons, the USSBS felt, "While many of the preexisting yardsticks are revolutionized, the more basic principles and relationships (of airpower) remain."[80] Direct attacks aimed against vital centers (both military and civilian) would destroy both an enemy's capability or will to resist. The idea of atomic weapons delivered by unescorted jet bombers, or missiles, permeated the minds of air thinkers. This new destructive capacity seemed to offer airmen the ultimate tool for strategic bombardment. "Jetomic" air power had come of age. However, doctrine had changed little.[81]

Because of the favorable reputation enjoyed by the old Air Corps Tactical School, Air University at Maxwell Field, AL, received the mission to "review, revise, and prepare publication of Army Air Forces' Doctrine."[82] In 1946, Air University established the Air War College (AWC) The Evaluation Division of the AWC drew deeply on the historical experiences of World War II in preparing Air Force basic doctrine. The deputy chief of staff for operations felt "the theory of the strategy of air power, particularly strategic bombing, has never been adequately put on paper..." and that FM 100-20 was "obsolete and entirely inadequate."[83] It was felt that rather than being always "interdependent" with land power, there were times when air power may be an independent force. Following the National Service Act of 1947, two AWC

seminars began working on the task of revising FM 100-20The result, after six years of work, was the United States Air Force Basic Doctrine, AFM 1-2Deceptively small, printed on paper 4 1/4 by 6 3/4 inches and using only seventeen pages, this first Air Force basic doctrine manual was the keystone of a whole series of manuals. The new Air Force basic tenets were: 1) Air forces will most likely be the dominant force in war; 2) The United States must maintain an air force in instant readiness to launch a full-scale attack immediately upon the out-break of hostilities; and 3) Attacks directed against selected "sensitive" targets will cause the collapse of the national structure.[84]

It is significant that this doctrine was written after the Korean conflict, and yet ideas of strategic bombing alone deciding a conflict remained. Korea was thought to be an aberration, a war in which the Air Force was hamstrung by political restrictions not faced in the Second World War, nor likely to be in place for a war with the Soviet Union. President Dwight Eisenhower placed great importance on the role of military power in maintaining peace in the world. With his "New Look" policy based on America's nuclear arsenal, he emphasized "military power is for our defense and to deter aggression. We shall not be aggressors, but we have and will maintain a massive capability to strike back."[85] Brigadier General Dale Smith worked with the Air War College and in 1954 wrote that "Bombardment of an enemy heartland, when done in force, rapidly accelerates its crisis. In war (bombardment) paralyzes the nation and destroys it as a social entity."[86] Military leaders and Air Force basic doctrinal manuals published during the 1950's, reflected this continuing belief that strategic bombardment was the best use of airpower. It was considered a tool usable across the entire spectrum of conflict.[87] The feeling was, if strategic bombing could deter a general war, it could also deter or win small wars. Atomic airpower was the most cost effective means of preventing or fighting wars, and strategic

bombing doctrine remained the method to accomplish this. Vietnam was to be another rude awakening.

President Lyndon Johnson's decision to begin the sustained bombing of North Vietnam in 1965 caused a clash between military and political leaders. President Kennedy's "flexible response" policy had not changed the Air Force idea that strategic bombing could compel a nation to do our will.[88] Initially in Vietnam, the air force was supposed to be the dominant force in the conflict. The Joint Chiefs of Staff planned for air forces (both Air Force and Naval) to launch an all-out attack on ninety-four targets in order to destroy North Vietnam's ability to continue as an industrial, viable state.[89] The criteria used to select these targets clearly show that the Joint Chiefs of Staff desired to wage a classic strategic bombardment campaign and reflected the fundamental principles of Air Force strategic bombing doctrine. The first priority was to gain air superiority, followed by the destruction of North Vietnam's oil facilities and then its industrial complex.[90] This plan was not however, in concert with U.S. political objectives. President Johnson's objective in Vietnam was to use air forces in a phased attack aimed at removing Hanoi's support to the insurgency in the South. NOT to destroy North Vietnam as a nation.[91] The resulting air campaign, Rolling Thunder, was designed to coerce the North Vietnamese by slowly and gradually expanding the intensity of air attacks against increasingly more :important targets.[92]

Rolling Thunder did not achieve either the political or the military objectives assigned it, and should have shown how flawed Air Force doctrine was. While the ninety-four target plan matched current doctrinal beliefs, it did not explain the failure of airpower against an agrarian enemy waging guerilla warfare. Factors such as the nature of war that the enemy was fighting, his intensity, and the relative matching of political objectives between the U.S. and an adversary,

were not discussed. In short, the fundamental tenets did not seem to apply. Political restraints did not permit a concentrated bombing effort. The object in this war was not to destroy the enemy. Additionally, North Vietnam was not an industrial nation.[93] The result was a doctrine which no longer seemed relevant. Vietnam could not be passed off as another aberration like Korea.[94] Small wars were not conducive to being contemplated as conventional conflicts on a less grand scale.

The result was "two decades of doctrinal confusion."[95] The 1971, 1974, and 1979 versions of Air Force basic doctrine largely ignored Vietnam, just as previous doctrine writers had forgotten about Korea. Instead, these versions focused on theater-level conventional warfare. Centered on the European scenario, Air Force doctrine still saw strategic actions "involving attacks against the vital elements of an enemy's war sustaining capabilities," and "tactical actions (which) are battle-related."[96] It was still felt that if you "destroy an adversary's capability to wage war, then the will to wage war disappears also."[97] Even the 1984 version of Air force doctrine believed wholeheartedly in the total destruction of an enemy's capability or will as the military object. However, it failed to discuss adequately how to wage war on other than a strategic level.[98]

CHAPTER II

A LOOK AT THE NEW AFM 1–1

Introduction

The new version of the Air Force's basic doctrine is evolutionary, yet revolutionary, in concept. Organized into two sections, Volume I is the "bare-bones" discussion of basic aerospace doctrine contained in twenty pages. The second volume is a series of twenty-five essays and two appendices providing both the historical evidence as well as the theoretical background used in developing the doctrinal statements articulated in the first volume. For the first time, it is now possible to "replicate the reasoning and make use of the factual evidence from which doctrinal writers derived their generalizations."[99] The intent is for every airman to "read, study, and understand Volume I," while being conversant with Volume II.[100] Within the first volume, doctrine is discussed in a "building-block" manner, so that understanding the discussion requires its four chapters be read in order. The first chapter places aerospace power within the context of war. Chapter Two discusses the nature of aerospace power, while Chapter Three provides guidelines for employing aerospace forces at the operational level. The fourth chapter is concerned with the preparation of air forces for war. This new version of basic aerospace doctrine, is evolutionary by validating long held tenets and in recognizing how technology has changed the nature of war. It is revolutionary when compared to the assertions found in previous Air Force doctrinal manuals, and in some of the statements it makes regarding aerospace power's role in the nature of war.

A clear examination starts with the definitions of doctrine found in the introduction. To paraphrase, aerospace doctrine is the set of beliefs held on the best way to use air and space power. It is based on experience and theory and provides a guide, rather than a set of rules, for

the exercise of judgment. It is a standard which should continually mature as new experiences force alterations.[101] Understanding this doctrine first requires an understanding of war in general.

War and the Military Mind, Chapter One

"War and the American Military" is the title of Chapter One, and this section of AFM 1-1 attempts to place war in its human and political context. War, it is argued, is not an aberration of political experience. Rather, it is normal and only one means, generally the last one, used to achieve a nation's vital interests. The resemblance to Clausewitz's dictums is striking, as Volume I states that war is an instrument of national policy and that the military objective is to compel the adversary to do our will.[102] The discussion then follows Sir Basil Liddell Hart's thinking in stating that the purpose of war is a better state of peace.[103] What is important to notice is that this better state of peace requires the adversary's hostile will and ability be overcome. Our doctrine now states that overcoming hostile will "can involve military operations" but the government's other instruments of power (political and economic) normally are better suited.[104] Here, the realization that bombing to break civilian morale has often not been effective is clearly stated. In fact, the implication is that the military is better suited to attack an enemy's ability to resist and must be coordinated with the other instruments of power while guided by the principles of war.[105]

The next section returns to Clausewitz in defining war as a human enterprise and explaining the different characteristics of war. War is characterized by fog, friction, and chance; there-fore, success requires mastery of the science and art of war.[106] Previous manuals never even acknowledged the existence of danger, exertion or chance, and the 1984 version noted only in passing the idea of uncertainty in war.[107] War is complicated since it can be characterized by

level of intent (unconditional surrender versus retaliation versus causing a change in behavior), level of effort (total versus partial mobilization), level of intensity (The entire spectrum of war from subversion to nuclear war), or level of involvement (unilateral versus coalition)Warfare is also categorized into the strategic, operational, and tactical levels in this section of AFM 1-1.[108] This is the first time Air Force doctrine has mentioned the operational level, which focuses on fighting campaigns, and acknowledged that preserving a stable global environment involves military responsibilities besides preparing for war.[109] The full range of operations in warfare is now addressed before discussing aerospace power's role in each category.

The Nature of Aerospace Power, Chapter Two

Chapter Two provides this discussion by explaining how aerospace power, while not changing the essential nature of war, does change the way in which it is conducted. The aerospace environment is defined as the entire expanse above the earth and provides unlimited access to the earth's surface.[110] Aerospace power, defined as "the ability to use a platform operating in or passing through the aerospace medium for military purposes," has inherent attributes not available to surface forces.[111] These attributes are speed, range, flexibility, and versatility, which allow aerospace forces to be applied against almost any point of the earth's surface and can be directed against any instrument of enemy power, either independently or in concert with surface forces.

Roles and missions of Aerospace forces take on new meanings with this version of AFM 1-1The realization that most aerospace forces can perform multiple roles and missions has forced a new definition based on objectives rather than platforms or weapons. Now, only four basic roles define the broad purpose or function of aerospace forces. The first role is called aerospace control and it encompasses the missions which assure our use of the aerospace environment

while denying the same thing to an adversary. It normally includes the missions of counterair and counterspace operations. Counterair operations are those flown to allow the necessary degree of freedom from enemy air threats. It is an enabling mission which allows all of the operations necessary in war to be conducted without undue interference from an enemy's air forces. Counterspace insures this freedom is extended beyond the atmosphere. Force application is the second role, and it is used to apply combat power against surface targets unrelated to those covered in the aerospace control role. Missions usually associated in this area are strategic attacks, interdiction, and close air support. Strategic attacks are those which will achieve effects on the war as a whole, and its effectiveness is determined by enemy reactions. Missions which delay, disrupt, destroy, or divert enemy surface potential before it reaches the battlefield are called air interdiction. These missions also incorporate battlefield air interdiction or sorties flown with the same goal as air interdiction, but instead have a “near-term” effect on the battle area. Close air support are those air actions conducted against hostile targets in close proximity to and requiring de- tailed integration with friendly forces.

The missions of air refueling, airlift, electronic combat, spacelift, surveillance, and reconnaissance generally make up the third role of force enhancement. These missions increase the capabilities of both aerospace and surface forces to perform their own missions, but they do not apply firepower on the main target set. Electronic combat missions are actions conducted in support of other operations but attack to destroy or degrade the enemy's electromagnetic capabilities. Air and spacelift provide the resources necessary to conduct warfare in their respective environments. Surveillance assets provide warning on enemy initiatives and threats, while reconnaissance missions obtain detailed information on matters of particular importance. The final aerospace role is called force support, or sustainment operations that are conducted to

insure the successful completion of the previously mentioned roles. Aerospace forces depend on surface bases, require large amounts of stores, and particularly depend on highly technical maintenance. The ability to provide and defend these bases and resume operations following an enemy attack is crucial. Since the dawn of military history, supplies have controlled the size, scope, pace and effectiveness of warfare. The ability to control, repair, and support these assets, both on the surface and in space, is growing in importance. Base operability and defense, logistics, combat support, and on-orbit support are the missions normally associated in this final role.[112]

Two additional items must be noted. First, roles and missions are not mutually exclusive. Strategic attacks directed against aircraft factories may fill an aerospace control role. In addition, aerospace weapons and delivery vehicles are not limited to particular roles. Gone are the old strategic and tactical differentiations. Aerospace power is again thought of as being indivisible. It is best employed by realizing the unique attributes inherent in it.[113] Therefore, just as the principles of war guide the military instrument in warfare, there exist tenets which guide the employment of aerospace forces within the military. These tenets reflect a more specific understanding of the aerospace medium and are designed to complement the principals of war. The seven tenets (Centralized Control/Decentralized Execution, Flexibility/Versatility, Priority, Synergy, Balance, Concentration, and Persistence) highlight important ways that aerospace forces differ from surface forces.[114]

Employing Aerospace Forces, Chapter Three

Employing aerospace forces is the subject of Chapter Three. This section fills the previous void in U.S. Air Force doctrine by dealing for the first time with aerospace power at the operational level of war.[115] It is the largest section, taking nearly one-third of the entire

document to explain the influences on and orchestration of aerospace power at this level. It begins by explaining again aerospace power's versatility in attacking a target anywhere on the earth's surface, and then adds how this versatility, combined with speed, range, and flexibility, provide aerospace forces the ability to strike targets affecting any level of warfare at almost any time. The implication is that aerospace forces can conduct both independent and complementary operations. If independent, the effects of the attacks may be decisive by themselves, or they may combine synergistically with other surface forces and be just as decisive in combination.[116] Complementary operations can be conducted in parallel with the surface forces, or they may support or be supported by the army, navy, or marines

AFM 1-1 acknowledges that there is no universal formula for properly employing aerospace power in a campaign, but it does provide guidelines to follow. First, matching the military operational objectives together with both the strategic political aims and tactica1 goals, is "paramount" in building a successfu1 campaign.[117] The nature of the threat (which defines enemy centers of gravity), the characteristics of a particular type of war (level, objective intent, support, intensity, weapons involved, and extent of allies), and the nature and location of the theater (jungle, desert, or woodland; next door or 7,500 miles away) must be considered in developing the optimal use of aerospace power. Secondly, an airman, from any service, must provide aerospace expertise to the theater commander.[118] He must think of how aerospace forces can best be used, set the conditions to give combat forces the best chance of success, adjust operations as needed, and then exploit the opportunities combat presents.[119]

The third major section in Chapter Three deals with orchestrating the roles and missions of aerospace forces. Here, all four roles are discussed and the guidelines of how best to employ aerospace power is presented. Aerospace control is <u>normally</u> the first priority.[120] Applying force

through independent strategic attacks, is now recognized as affecting the enemy's capability, while only possibly affecting his will to wage war. This version of basic doctrine notes that "damaging psychological attacks can be an elusive objective."[121] In addition, nations having less developed transportation, communication, and industrial systems, are not necessarily vulnerable to strategic attacks.[122]

Complementary operations (including strategic attacks, interdiction and close air support) are then discussed by relating their results to the overall objectives of the theater commander. Attacks far behind enemy lines will have broader operational effectiveness, but their effects will not be visible to surface forces. Close air support produces the most immediate effects, but its effectiveness is rarely felt across the entire theater. Force enhancement is noted for the vital role it plays, by multiplying combat effectiveness through its transportation, refueling, warning and control, and electromagnetic combat missions. Sustainment is covered in the fourth role of force support. Aerospace forces depend on bases, spare parts, munitions, and services to conduct operations and operate synergistically with surface forces in resource protection and attainment. The final section of this third chapter returns to the principles of war as viewed by airmen. Operating in three dimensions results in a different understanding of these guidelines. The traditional nine principles have been reduced to eight by combining mass with maneuver. This reduction and restatement of terms reflect the distinctive viewpoint and unique characteristics aerospace power brings to war.[123] In addition, the vital role air bases play in the employment of aerospace power is discussed.

Preparing the Air Force for War, Chapter Four

Chapter Four, entitled "Preparing the Air Force for War," completes Volume I. It discusses guidelines for the Department of the Air Force in organizing, training, and equipping

aerospace forces. Noting the legislated distinctions between the Air Force, Naval, Marine Corps, and Army aerospace forces. AFM 1-1 acknowledges that "only the Air Force is charged with preparing forces... able to fully exploit aerospace's flexibility and potential decisiveness."[124] This chapter covers the need to be prepared to fight as a joint team and why Air Force elements should be organized for wartime effectiveness rather than peacetime efficiency. These ideas, plus the need to be organized to exploit aerospace power's versatility, are strong arguments for the organizational restructuring currently underway within the Air Force. Since people are a decisive element in war, the new manual's guidance encourages safe, realistic training conducted for all levels of war, with special emphasis on the training and professional education necessary for joint operations.[125] In addition, this version places particular emphasis on the need for power projection capabilities in acquiring new equipment.

Evaluation of AFM 1-1 as Doctrine

Colonel Dennis Drew, in his article, "The American Air Power Doctrine Dilemma" provides a guide to determine "good doctrine."[126] In essence, doctrine must: 1) Identify the unique characteristics of aerospace power; 2) Integrate these characteristics within the realities of war; and 3) Have evidence proving its basic assumptions are true. Regarding this new version, it superbly identifies those attributes making aerospace power unique. Chapter Two and its accompanying six essays examine how elevation above the earth provides unmatched advantages over surface forces. Because of the attributes of speed, range, flexibility, and versatility, aerospace power can almost always apply force against almost any instrument of an enemy's power at any level desired. This force can be employed independently or in concert with surface units. It can be applied with varied intensity against almost any target. These attributes do not change the essential character of war, just the way aerospace forces conduct it.

In integrating these attributes into the nature of war in general, this manual is quick to point out the capabilities, as well as the limitations, of aerospace power. This power is defined as being applicable to several characteristics of warfare. Whether war is categorized according to objective. level of effort, intensity, allied support, types of weapons, spectrum of conflict, or levels of war, aerospace forces have a role. This version also relates these roles to the overall objective in war and then observes that the military instrument is not the only one involved. When used, however, military forces are guided by principles of war which are, by necessity, viewed differently by airmen. In fact, to integrate aerospace power properly into the overall military effort, aerospace forces should be guided by their own tenets. These tenets highlight the differences as well as some of the limitations between aerospace forces and their surface counterparts. For example, decentralized control has been shown to be ineffective.[127] In addition, destroyed targets can sometimes be rebuilt. Aerospace power must be applied persistently to be effective.[128] This version also articulates some limitations of aerospace power. For example, aerospace power's presence is transitory. Aircraft need to rearm, spacecraft travel over the horizon, and airfields may not always be present.[129] Aerospace power is also more sensitive to technology in that the smallest innovations can have major impacts on effectiveness.[130]

The last requirement of “good doctrine” is that, to be completely effective, recent history must prove this new version correct. Written just before its outbreak, Desert Storm provides one test to compare the realities of war to this new AFM 1-1's assertions.[131] First, the use of the military acknowledges the idea that war is but another instrument of policy. Iraq was first isolated politically and economically. On the day of Kuwait's invasion, 2 August 1990, the first United Nations Security Council (UNSC) resolution was passed condemning the invasion and

demanding the withdrawal of Iraqi troops. In all, a total of twelve UNSC resolutions were passed. By 9 August, full trade sanctions were imposed.[132] When Saudi Arabia requested military assistance on 6 August, F-15's were deployed within twenty-four hours, and were flying defensive Combat Air Patrols (CAP) twelve hours later.[135] The speed and range of these aerospace forces were unmatched. By 10 August, over 100 aircraft had arrived. The 82nd Airborne Division's ready brigade and the 101st Airborne Division (Air Assault) began their deployment on August 11th, by air.[134] Naval units arrived on 8 August and helped reduce the risk to land based airfields and ports facilitating the deployment of the I Marine Expeditionary Force. The Marines joined with their Maritime Prepositioned Stores (MPS) on 17 August and were the first mechanized force available to General H. Norman Schwarzkopf, the theater commander.[135]

The political aims were spelled out on 5 August by President Bush and led to the following overall military objectives: 1) Neutralization of the Iraqi national command; 2) Ejection of the Iraqi forces from Kuwait and the destruction of Iraq's offensive threat; 3) Destruction of known nuclear, biological, and chemical weapons; and 4) Assistance in the restoration of the Kuwaiti government.[136] Notice that all deal with Iraq's capability to resist and not its will. The overall military strategy was, at first, defensive. It centered on the goals of deterring Iraqi incursions into Saudi Arabia and confronting Saddam Hussein with unacceptable losses for any continued aggression.[137] By September, offensive operations were being planned and the linking of national policy to military strategy and then to operational objectives was clear.[138] Planning for the air portion took into account the particular characteristics of the theater. Kuwait was different from Vietnam and Korea. There were no triple canopy jungles or vast woodlands in the desert. Aerospace power had unhindered access to enemy forces and a four-phase air plan was developed accordingly.[139] Phase one called for conducting strategic

attacks in Iraq by destroying the command and control structure, weapons of mass destruction facilities, and its electric, transportation, and oil industries. Phase two was to gain air superiority over Kuwait, while phase three was to isolate the Iraqi army from its source of supply, and prepare the battlefield for surface action.[140] All three of these phases were conducted simultaneously and were stunningly successful.[141] Surface forces were ultimately required to eject the Iraqi army. Phase four of the air plan, included complementary aerospace operations in support of and in parallel with ground forces. Once again, the results were "spectacular."[142]

While these aerospace control and force application missions were being conducted, force enhancement and force support missions contributed to aerospace power's success. Airlift forces moved over 482.000 passengers and 513.000 tons.[143] Over 170 million gallons of fuel were off-loaded by tanker aircraft and electronic combat missions effectively neutralized Iraq's integrated air defenses.[144] Air Force civil engineers literally built cities in the sand. Using pre-positioned stores and materials from Afloat Pre-positioned Stores (APS) they provided essential base infrastructure for twenty-one airfields.[145] Sufficient stocks of supplies were critical to success. The "Desert Express," a C-141 flown daily from the U.S., provided next-day-service for almost all badly needed supply items, while stocks of food, munitions, and personnel were maintained at sufficient levels. The Air Force never ran out of ammunition during the forty-four days of round-the-clock combat operations, and spare parts were maintained at a level that achieved nearly 100 percent of the planned sortie requirements.[146]

AFM 1-1 and Desert Storm

Desert Storm did indeed validate much of the guidance found in the new AFM 1-1This war was a natural outgrowth of two countries in conflict. The speed, range, and flexibility of aerospace power allowed for quick responsiveness and striking power. One airman, with

centralized control over all aerospace assets, coordinated the air plan which allowed the attainment of the operational objectives. The characteristics of the war, the theater's nature and location, and available assets, guided the operational planning. Aerospace control enabled all other ground and aero- space missions to be conducted uninhibited by enemy air actions. Strategic attacks were vital and at times made decisive contributions.[147] Force application missions attacked the full spectrum of enemy capabilities. Complementary interdiction and close air support missions "not only prepared the battlefield, they destroyed the enemy contained on it."[148] Force enhancement missions both enabled and improved the combat effectiveness of aerospace and surface forces. Finally, the sustainment of the force support forces was unmatched in modern times.[149]

While all these roles and missions seemed well covered by the doctrine described in AFM 1-1, there do appear to be some glaring deficiencies. First, elements of all Special Operations Forces (SOF) were deployed to Desert Storm and performed a variety of missions.[150] Over fifty SOF aircraft flew more than 830 sorties, yet the original draft AFM 1-1 mentioned this mission only in the airlift section.[151] It was only after intervention by the Chief of Staff of the Air Force that this area was expanded.[152] Unfortunately, the additions do little to clarify an already confusing issue. In Chapter 2, SOF are described as being able to provide the "capabilities for many roles and missions."[153] It further states effective force application requirements make it essential to coordinate (SOF) actions with the theater air commander.[154] However, AFM 1-1 also describes SOF as an example of a force enhancement mission as well as an "important capability" acting independently, but in coordination with, the theater air commander.[155] To further obscure the issue, AFM 1-1 also states the SOF air forces should now be under the control of a separate commander, a Joint Special Operations Air Component

Commander (JSOACC) , who should coordinate his actions only if his operations are part of a larger air action.[156] This violates the idea of the "master tenet" of aerospace power, centralization, where aerospace forces should be centrally controlled to achieve the advantages aerospace platforms provide.[157] Finally, combat search and rescue (CSAR), traditionally assigned to SOF and actually accomplished by them in Desert Storm. is not mentioned as a mission at all.[158] An additional essay clarifying the use, command, and coordination of SOF is needed.

Likewise, a second major omission appears to be aerospace defense. While AFM 1-1 acknowledges the need for defensive counter aerospace operations, it couches it by saying"… commanders must concentrate on defeating the enemy's ability to seize the initiative. The object is to make the enemy's attacks too costly for the results they achieve."[159] While this type of defense may be fine for situations like the Battle of Britain, terror attacks from theater ballistic missiles (like Scud attacks), do not fit and need further amplification. The requirements for basic guidance on protecting equipment, bases, and aircraft has increased. The need to protect air bases is articulated, but there is little basic guidance on the principles to accomplish this.[160] While advice on the normal primacy of aerospace control, followed by the conduct of independent or complementary operations, is provided, the only guidance in the area of defensive operations is that unless there is an insignificant enemy aerospace threat," defensive actions will be required."[161] The only definitive guidance offered is that "to achieve a powerful defensive capability, aerospace forces require effective warning; command, control, and communication systems; and careful integration with surface based capabi1ities."[162] I n the same way that essays on strategic attack, air interdiction, close air support, and deterrence are addressed, an added section on air defense is needed. This new essay should include its history and theory. It should

examine the success of Great Britain in World War II as well as the failures of the Luftwaffe and the Japanese Air and Naval Forces in the same conflict. The air defense battle should be examined to include early warning systems (ground, air, and space based as well as the different means of intelligence), weapon systems (ground, air, and space based), and command and control issues to include integration with Army defensive missiles.[163]

Two other areas receiving little attention in the new AFM 1-1 are the political and national considerations in using aerospace power, as well as the vital need for intelligence. If we accept the fact that "war is but one means used by nation-states to achieve disputed objectives," and that "of particular importance is the required linkage between strategic objectives, operational (campaign) objectives, and tactical objectives," then it is axiomatic there will always be some political controls on the use of the military instrument in war.[164] The new AFM 1-1 goes to great lengths describing how the nature of the enemy should be a primary consideration, that the characteristics of a war should shape campaign decisions and that the nature and location of the theater greatly influences decisions.[165] However, in this section on employing aerospace forces, only a passing reference in the accompanying essay discusses the probable political restraints on military force.[166] If war's objectives in this modern age are less than total (i.e. do not include the total destruction or subjugation of a country) then military means will be limited. This implies a negotiated settlement of the dispute between the involved nations will occur, and that means other than military force will finally resolve the issue. The military will thus be an enabling means for a political solution, and must therefore be limited by some kind of political restraint. This political-military relationship is discussed in the overview to volume two, but the interpretation of political restraints into effective aerospace practices is not clarified.[167]

The final significant shortcoming is in the area of intelligence. Instead of using this all-inclusive term, AFM 1-1 talks in terms of surveillance and reconnaissance as force enhancement missions. By the Joint Chiefs of Staff definition, these missions are but means to collect information.[168] It is only after this information has been collected, processed, integrated, analyzed, evaluated, interpreted, and disseminated that it becomes intelligence.[169] Volume I of the new AFM 1-1 describes surveillance and reconnaissance as two seemingly mutually exclusive entities rather than viewing the merging of their information into usable intelligence.[170] Volume II of the new basic doctrine further confuses this issue by dealing with these two missions as well as signals intelligence (the exploitation of signals in the electromagnetic spectrum) and intelligence provided by the Joint Surveillance Target Attack Radar System (JSTARS), an airborne system intended to provide joint Air Force/Army management of the battle area.[171] What is needed is a clear explanation, including the background evidence and supporting rationale, of the intelligence system needed by aerospace forces. It certainly will include the surveillance and reconnaissance missions, but it must also articulate the intelligence process. Guidance is needed on the separate foci for strategic, operational, and tactical intelligence. Is there a need for intelligence collected by national means to be used by operational or tactical level commanders? The current discussions concerning the lack of bomb damage assessment abilities, the push for directly using space assets in aircraft employment, and hardware changes to aircraft are indicative of the inadequate concepts behind the use of intelligence with aerospace forces.[172]

CHAPTER III

FUTURE IMPLICATIONS

National Security Policy

As previously stated, doctrine is a formalized set of guidelines based on experience, but it must also keep an eye to the future. A critical relationship exists between what we think the best military response to threats facing the United Sates is and aerospace doctrine. First, they both exist within the national security policy environment. The National Security Strategy of the United States is the official statement of American national interests and goals; regional objectives; and the political, economic, and mi1itary agendas for the near future.[173] The newest version recognizes that the collapse of the former Soviet Union means the Cold War is over, along with the 40 year grand strategy of containment it required.[174] Therefore, we now confront dangers more ambiguous than those previously faced. In the emerging post-Cold War multi-polar world, international relations will be more complicated, more volatile, and less predictable.

Despite the seeming disorder, there exist certain fundamental, basic interests which remain enduring in this "new world order." These overarching goals include: 1) The survival of the United States as a free and independent nation; 2) A healthy and growing U.S. economy; 3) Healthy. cooperative, and politically vigorous relations with other nations; and 4) A stable and secure world.[175] From the military's point of view, these goals require a force able to deter any aggression threatening the United States and its allies, defeat any attack directed against them, and aid in combating threats to democratic institutions.[176] The implications of these statements are that the U.S. remains the only nation with truly global responsibilities. While we cannot and will not be the world's policeman trying to solve every security dilemma, we remain the country

others turn to when in distress. Our vital interests are interconnected with others throughout the globe, and American leadership remains an important ingredient in defining global politics.

National Military Strategy

The second critical link to doctrine is in national military strategy. Strategy is influenced by what we think is the best way to use military power. Since doctrine is also influenced by strategy, aerospace doctrine shapes and is shaped by national military strategy. As we saw in the 1950's, if the military strategy focuses on a nuclear response, aerospace doctrine will emphasize a different mix of weapons systems than one relying on conventional forces battling an insurgency. A strategy based upon the view that potential threats are relatively unpredictable, will require a more flexible doctrine.

The newest National Military of the United States is such a strategy.[177] It states, "the fundamental objective of America's armed forces will remain constant: to deter aggression and. should deterrence fail, to defend the nation's vital interests against any potential foe."[178] The strategy is founded on the premise that the U.S. will provide the leadership needed to promote peace and security by emphasizing multinational operations only in operations where our vital interests are at risk.[179] Since it is now essential that the U.S. retain the capability to respond to crises that no one can currently predict, the new national military strategy is built on four foundations. The maintenance of a modern, fully capable and reliable strategic nuclear deterrence and defense force, remains America's first priority. The forward presence of a relatively small amount of American forces is the strategy's second foundation, while crisis response, or the ability to respond to regional threats, is the third. The final imperative is reconstitution, which involves the forming, training, and fielding of new fighting units.[180]

Because of the changes in the world environment, the threats this strategy is tailored to meet are regional rather than global in nature. While the U.S. will "retain the potential to defeat a global threat," the new emphasis is "primarily focused on deter- ring and fighting regional rather than global wars."[181] Forward presence and crisis response are the two tenets central to this regionally oriented strategy. In peacetime, forward presence is the glue holding alliances together, and it will hopefully help reduce regional tensions. In times of tension, crisis response gives the U.S. the ability to project power when and where the National Command Authority (NCA, which includes the President and the Secretary of Defense) determines. America, in protecting its vital interests, must be able to project its power to Europe, the Middle East, and Asia rapidly, and in sufficient strength to defeat any adversary not deterred by its forward presence. The forces used to accomplish this power projection are part of what is now called "the Base Force."

The Base Force is the minimum combination of the active and reserve components of all four services needed to meet America's basic goals.[182] It is a significantly reduced force from the Cold War era, and is consistent with the reduced global threat. Yet, it is still able to "preserve a core capability to deter aggression, provide meaningful presence abroad, respond to regional crisis, and rebuild a global warfighting capability."[183] It must be a flexible force and able to adapt to changing circumstances. Those forces not dedicated to strategic nuclear deterrence will be assigned forward presence or crisis response duties.[184] Those earmarked for crisis response will train for regional contingencies. The Base Force is therefore divided into four "force packages" and four "support capabilities."[185]

The force packages are those forces that will be directly involved in protecting American vital interests. While two of these packages are geographically oriented on specific areas, all four

are available for world-wide employment. U.S. interests in Europe, the Mediterranean, the Middle East, Africa, and Southwest Asia are protected by the Atlantic Force. This theater is primarily a continental one and forces are centered on land forces.[186] Pacific Forces are responsible for the Pacific area, Southeast Asia, and the Indian Ocean. The forces of a potential adversary in this theater are distinctly different from those in the Atlantic, so this force package is tailored to the maritime character of the area.[187] A reserve of "fully-trained, highly-ready, and rapidly deployable" forces are contained in the Contingency Force. This U.S.-based force includes an Army Airborne Corps and five additional divisions, seven Air Force wings, and a Marine Expeditionary Force.[188] The final force package includes all the forces which deter, or defend against, nuclear aggression. This Strategic Force will retain the traditional triad of nuclear assets as well as include a global protection against limited (nuclear) strikes (GPALS).[189]

Substantially smaller than the forces of the 1980's, the Base Force is the minimum force necessary to maintain American leadership throughout the world while still protecting our international vital interests. This force must, since it is the minimum, be efficient and flexible. The National Military Strategy describes the attributes each service's particular aerospace, sea, and land forces need to provide for the force package concept to work. Aerospace forces are needed to "provide a full spectrum of air combat capability."[190] These capabilities include "air superiority, strategic attack, mobility. air-refueling, and the support of surface forces."[191] In addition, aerospace forces must be able to conduct all missions necessary to achieve the theater commander's objectives, to include the ability to "strike an enemy's vital centers of gravity."[192] In other words, the nation's national military strategy requires aerospace power be employed at all levels of the operational continuum. A major concern for all military leaders must therefore be the proper exploitation of the aerospace environment against the full range of military targets.

This implies a service compatible command and control apparatus as well as compatible targeting schemes. The question therefore arises, as to the extent to which the services' systems are compatible in these areas.

Need for Joint Doctrine

In essence, there is a need for joint aerospace doctrine. The current keystone joint operations doctrinal manual, Joint Publication 3-0, Doctrine for Unified and Joint Operations, has been distributed as a test publication. Unfortunately, it is sadly lacking in guidance on the role of aerospace forces.[193] No mention of conventional munition strategic attack, offensive counterair operations, targeting priorities, or organizational frameworks is provided.[194] In addition, JCS Publication 26, Joint Doctrine for Theater Counterair Operations is vague about the command responsibilities of the Joint Force Air Component Commander (JFACC)According to this publication, the JFACC's responsibilities will be assigned by the Joint Force Commander (JFC)This job will "normally include, but is not limited to, planning, coordination, allocation, and tasking based upon the JFC's apportionment decision."[195] The JFACC does not have to be an Air Force officer. Rather, "the JFACC will be the service component commander who has the preponderance of air assets and the ability to assume that responsibility."[196] In some services' minds, this definition only makes the JFACC a coordinator with no authority to task another services' assets.[197]

It is my speculation that joint aerospace doctrine must expand beyond the service specific doctrinal bias each component of the military contains and seek a broader, more all-encompassing statement of aerospace power beliefs. Much like the inconsistencies of some of Sir Isaac Newton's Laws of Motion were explained by Albert Einstein's Special Law of Relativity, joint aerospace doctrine must be able to explain the fundamental tenets of aerospace power and

still not appear to be inconsistent with the unique environments associated with the different military components.[198] A joint service doctrine would therefore apparently need to include a higher level of generalization of aerospace power than one explaining its use in a service specific medium. In addition, this joint service doctrine must still explain the realities and requirements of aerospace forces flying in these same environments, and then account for the differences where the mediums overlap; such as in the littoral areas where our last three conflicts have taken place.[199]

Every service believes in centralized control, but each differs at which level it should be achieved. The Air Force embodies this idea at a higher level than any of the other services.[200] Centra1ized contro1 is the "master tenet" and the oldest forma1 one in the American aerospace experience.[201] First codified in the 1943 version of FM 100-20, centralized control under one airman has been desired since Billy Mitchell's St. Mihiel Offensive.[202] In most conflicts since then, it has been difficult to achieve. Centralized control, leading to coordinated operations between Royal Air Force and American bombers in World War II, was accidental.[203] It was much the same between the U.S. Air Force, Naval, and Marine airpower in Korea.[204] In Vietnam, the situation was even more fragmented. At one time or another, there were at least seven different air wars going on between the U.S. Tactical Air Force, Naval air, the Marine Corps, and Strategic Air Command.[205] No one below the national command authorities exercised anything resembling centralized control.

Since the essence of aerospace operational art is in the planning and employment of aerospace assets to achieve the overall commander's intent, how attack missions are targeted, and against which level of objectives, remain thorny issues among the services. As already discussed, Air Force doctrine states these missions can be conducted independently or as a complement to

surface operations. Strategic attacks can independently make a decisive contribution to the conflict.[206] Additionally, the effects of these strategic attacks may be increased when combined with simultaneous strikes hitting other types of targets. In Desert Storm, aerospace power conducted the first three phases (the strategic attack, air control attacks, and battlefield preparation attacks) at the same time. Colonel Drew's analogy of Iraq becoming like a hollow egg is very apt "When the ground war (phase 4) started, the shell shattered..."[207] Therefore, aerospace doctrine would target those systems, throughout the theater, most in line with the JFC's intent. Attacks deep in the adversary's rear will have broader operational effects, but a delayed impact on surface forces. Strikes close to surface forces will produce more quickly discernible results, but only in the vicinity of the attacks. The art of orchestration is in balancing the operational and strategic needs of the JFC with the tactical desires of surface commanders. Each service unfortunately views aerospace power, centralization, and targeting differently.

Naval Doctrine

Except for specifying the details of fleet tactics, the U.S. Navy does not publish formal doctrine. Maritime strategy, as articulated in recent years by the Chief of Naval Operations (CNO), is used as one key element in decision making and can be used to compare the naval viewpoint on aerospace power.[208] The Navy's emphasis on decentralized command can be traced back to the days of the British Lord Horatio Nelson.[209] Fleet commanders, whose great distance from the shore-based admiralty made centralized command impractical, were granted a "special trust" that is a natural consequence of this tradition. The navy, therefore, practices control by negation, believing decentralized command allows its forces the flexibility and autonomy required to prevail in a high friction environment. This means that fleets are thought of as supporting a theater commander and not under his control.[210] The problem becomes manifest

when the Navy feels power projection has become their primary mission and that the carrier battle groups are the "cornerstones" of this ability as expressed in the latest CNO statement of doctrine, The Way Ahead.

Written by the Secretary of the Navy, H. Lawerence Garrett, Admiral Frank Kelso, CNO, and the Marine Commandant, General Alfred Gray. The Way Ahead is the doctrinal statement on what the United States needs to do to retain "maritime superiority well into the 21st century."[211] These authors feel the capability to project sea-based power ashore is essential to the defense of U.S. vital interests "since most of the world's population lives within 50 miles of the sea."[212] The traditional naval role of sea control is now the enabling means to allow the navy to project power. They feel future large-scale regional deployments like Operations Desert Shield and Storm will be necessary since power projection is "the key to the successful implementation of a stabi1ity strategy."[213]

During the concluding stages of Desert Storm, a Naval Captain, Steven Ramsdell, visited the six carriers involved in the operation. While the Persian Gulf Conflict was a case of a navy primarily attempting to attack land targets, his report is a severe indictment on the U.S. Navy's use of carriers in modern conflicts.[214] He first notes that while some naval officers are familiar with the term "operational level of war," it has had no noticeable affect on Navy leaders.[215] The Navy did not bring a system to plan or direct the air war in Southwest Asia because it did not possess any kind of means to integrate the aircraft from more than a single carrier, let alone organize and execute a plan involving several carriers and land-based air.[216] Instead, Ramsdell reports senior naval officers independently told him that the naval air war should have been conducted very differently. Rather than going directly after targets in central Iraq at the outset, "airstrikes should have begun by attacking air defenses along the coast and then moved inland as

these defenses were rolled back. Strategic targets would have waited until the campaign got to them."[217]

The harsh implications of this report are manifold. First, under this decentralized concept, the Navy could, indeed would, never desire to be the JFACC. Since most American naval operations have been "Navy only" (this does include the U.S. Marine Corps) affairs, navy leaders have had the freedom to modify doctrine as deemed necessary. This has lead to the idea of "supporting" command and a desire for geographic delineations of responsibility versus an integrated functional division.[218] Having an entire air wing aboard one carrier obviates the need for an elaborate coordination mechanism. By definition, Naval units could not serve as a JFACC since they lack the "ability to assume the responsibility."[219] The second point is a logical continuation. Integrated, long-term operations directed against targets ashore are not suited to Naval air operations. In a brief operation, a decentralized structure may effectively harmonize the efforts. However, large operations extending over long periods of time require a centralized coordinating element. Captain Ramsdell notes that Desert Storm was not well suited for carrier operations. He stated a widely held opinion of senior leaders is that carriers are "suited for one-time raids similar to the Libyan action of 1986, but not sustained campaigning."[220] If the Navy truly feels they must be able to project sea-based power ashore in sustained operations, their aerospace doctrine must adapt.

Marine Doctrine

The Marines doctrinally tailor their forces in an attempt to exploit aerospace power. They are much more dependent upon it for fire support since they have very little organic heavy artillery. The bedrock of the organizational element is the Marine Air-Ground Task Force (MAGTF), which is always composed of a command element, a ground combat element, an

aviation combat element, and a combat service support element. The aviation element is designed to provide support based on the tactical situation facing the MAGTF.[221] Their organization, doctrine, and beliefs were formalized during World War II and remained essentially unchanged through Korea and Vietnam.[222] Despite the recent changes instituted by former Marine Corps Commandant, General Alfred M. Gray, Marine Corps doctrine, as described in Fleet Marine Forces Manual. -1 (FMFM-1), almost totally ignores the wide ranging effects aerospace power can have on war's conduct.[223] This is mostly a result of the expeditionary nature of the Marine Corps. Fighting in a series of short but intense amphibious attacks, Marine forces do not have the robust fire support above the division level that Army units possess. The aviation element is designed to compensate for this lack of fire power and is in fact substituted for general artillery support.[224] Each Marine infantry division receives the direct support of dedicated Marine air units which in turn act as a miniature close air support air force.

During sustained operations ashore in their areas of responsibility (AOR), the Marine Corps has agreed to what is called the Omnibus Agreement now contained in JCS Publication 26 and JCS Pub 13-01.2This agreement acknowledges that the primary mission of the MAGTF air assets is in support of the MAGTF mission. However, the MAGTF commander will make available to the JFC those sorties in excess of MAGTF requirements. In addition, nothing precludes the JFC in redirecting MAGTF air assets to higher priority missions.[225] During Desert Storm, the Marines provided sorties to the JFC for air defense and interdiction. This allocation equated to all the available Marine A-6 and EA-6B sorties and half the F/A-18 sorties.[226] Very quickly, JFACC-tasked Marine sorties decreased. Lieutenant General Royal Moore, Jr. commanded the I Marine Expeditionary Force's (MEF. the largest type of MAGTF) aviation combat element in Desert Storm. In an interview, he described how he “gamed the ATO

process.[227] He stated that after thirty-s ix hours, “w started weaning out assets.”[228] Two weeks after the conflict began, Marine air was only doing battlefield preparation (phase three) strikes. Lt Gen Moore stated, "If it didn't have something to do for the I MEF and battlefield preparation, we weren't going ...We had weaned ourselves out of any deep strike support."[229] This targeting scheme exactly followed Marine doctrine, and does not include the higher level of generalization necessary for joint doctrine.

Army Doctrine

The newest statement of Army doctrine is contained in a document called, AirLand Operations.[230] It is an evolutionary concept attempting to project AirLand Battle, at the operational level, into the next century. Written to update Field Manual 100-5's focus on a U.S.-Soviet conflict, TRADOC Pamphlet 525-5 provides guidance on joint operations across the operational continuum. This new concept divides the enemy area into three zones according to the JFC's “theater plan.”[231] This plan addresses theater strategic and operational objectives. The major focus of both air and land operations is in the middle zone, or Joint Battle Area.[232] According to this new doctrine, aerospace power is limited to air superiority (sic) missions while providing interdiction and close air support to the land forces conducting the “decisive operations.”[233] There is no mention of strategic air attacks, nor is there a discussion of land operations in support of aerospace forces. In other words, it seems aerospace power is again only thought of as airborne artillery. What is needed is a broader interpretation of what aerospace forces can accomplish. In essence, Army doctrine provides little in the way of a higher generalization of aerospace power's ability, nor does it explain the realities of conducting warfare in the different land and aerospace environment. To its credit, it does recognize that “the effectiveness of air operations in fact can decide the outcome of campaigns and battles.”[234]

However, it does not account for land operations conducted in support of aerospace missions though history is replete with these kinds of examples.[235]

Air Force Doctrine

In the new AFM 1-1, aerospace power has a higher generalization of its use than the other services. It presents an understanding of how aerospace power has worked best in war by presenting comprehensive historical evidence to support its claims. The new AFM 1-1 states aerospace power (land or sea based) can be employed against any level of objective from strategic to operational to tactical.[236] In addition, this new basic doctrine allows for aerospace power to be used in both an independent role, or in complementary operations supporting other services. Regarding organizational issues, the Air Force does not insist on command or operational control of all assets for the JFACC. This doctrine only insists that the air commander be precisely what the Joint Chiefs of Staff stated--a normal member of the joint command charged with the responsibility to coordinate, plan, and de- conflict the execution of the overall theater air plan in meeting the guidance and objectives of the JFC.[237]

Returning to the definition of aerospace power, AFM 1-1 states it is "the ability to use a platform operating in or passing through the aerospace medium for military purposes."[238] Using this explanation, it is clear that aerospace power is not the sole domain of the Air Force. All U.S. military services operate aerospace systems of one kind or another. For this reason, AFM 1-1 states that "the doctrine in this manual (with the exception of Chapter 4, Volume I) is written to apply to all aerospace systems without regard to the uniforms worn by those who operate them."[239] While written by airmen, it is an aerospace doctrine written for use by all practitioners of aerospace power. However, while AFM 1-1 has this higher generalization and appears ready

to account for differences where service mediums overlap, it still does not explain the realities of warfare conducted in different environments.

Aerospace operations in purely maritime conditions are not discussed in this new doctrine manual. The unique capabilities and limitations of carrier operations are not covered in any manner. While the effects of Naval and Marine aviation are given considerable coverage, the use of aerospace power in maritime missions such as sea control, mine-laying/area denial and wide area surveillance, appears nowhere. Likewise, Army air assault needs are not discussed. Where soldiers, sailors and marines must, by necessity, have a "vertical" view of combined arms operations, airmen see it in three dimensions. Surface forces divide the battlefield into geographic delineations, zones of the theater plan, and AORs. Airmen, because of aerospace power's unique characteristics, look for effects across a much broader spectrum. Instead of the traditional two dimensional model of warfare, where an enemy's forces in the field are defeated and sequentially rolled back to expose the vital centers, airmen feel a new form has evolved.[240] Aerospace forces add the third dimension so that devastating effects can be obtained by simultaneously attacking all of an adversary's capabilities. These two viewpoints must be reconciled to achieve the effects necessary by our new strategy. These effects can best be achieved by centralized control and a broad-based targeting plan. Depending on the nature of the conflict, this control may need to be theater-wide or necessary only at the tactical level. A basic aerospace power doctrine is needed which is general enough to cover the whole range, but specific enough to provide theater campaign planners a basis for action.

Resolution

Just as Werner Heisenberg proved no system is consistent when defined within itself, the disagreements between the services regarding aerospace doctrine show we need a new, all-

encompassing set of guidelines.[241] A doctrine which aids in planning independent as well as complementary aerospace operations, and realizes the particular needs of all the services, as well as describing the advantages and limitations of each of their aerospace forces, would be ideal. The new AFM 1-1 goes a long way in this regard. It is not joint doctrine, but it is written for all airmen in the hopes they take full advantage of elevation above the earth's surface.[242] It attempts to place aerospace power as a co-equal with land and sea power. The Way Ahead, FMFM 1, and AirLand Operations, do not acknowledge modern aerospace power's potential and they seemingly are clinging to an outdated model. AFM 1-1 does not yet explain the realities of warfare conducted in mediums other than those missions flown in the aerospace environment. Perhaps General Carl "Tooey" Spaatz had the best summary of the equality of aerospace power when he said,

> The argument has been advanced that the Air Force should only be concerned with land objectives, and that the Navy with objectives on and over the water. That distinction is to deny the peculiar quality of the air medium, the third dimension. The air is indivisible; it covers 1and and sea.[243]

Only the inclusion of space would provide a more complete statement of aerospace power's need to expand its doctrine in all of warfare's mediums.

CHAPTER IV

CONCLUSION

Doctrine, a codified set of beliefs about what has been learned and what is thought to be the best way to use aerospace power, has indeed evolved with this newest version of AFM 1-1. Getting to this point was not easy. World War I did not provide relevant experiences for theorists to develop into a completely coherent set of guidelines. Airpower was thought of as an auxiliary to the infantry, although by 1940 there were some inklings of independent operations. Douhet, Mitchell, and the instructors of ACTS began the intellectual process which resulted in the American bombing doctrine that predominated in World War II. Airpower alone, they thought, was sufficient to win wars. Precision bombing of a few select portions of the complex industrial web of a nation would destroy both the capability and the will of the adversary. The means to attain this end was daylight, high altitude, precision bombing. Unfortunately the results did not measure up to expectations.

The air plans resulting from this doctrine, AWPD-l/AWPD-4/AWPD-42/CBO and Matterhorn, were not the decisive elements they were envisioned to be. While they did identify unique attributes of aerospace power, they did not integrate them into warfare as a whole. The capabilities of strategic bombing were overrated and the limitations underestimated. While a significant factor, airpower was not the dominant force in World War II, and a doctrine emphasizing that airpower alone could win wars was incorrect. Despite these facts, Air Force doctrine remained unchanged. Post war doctrinal manuals merely replaced precision bombing with the massive damage brought about by air and space delivered atomic weapons. The U.S. concentrated on strategic nuclear attacks and all but denied the possibilities of war below this threshold.

With the newest version of Air Force basic doctrine, the Air Force has returned to the roots of war itself. Warfare's place in policy making is explained, and with it, aerospace power's role in the military. Speed, range, flexibility, and versatility are the attributes making aerospace forces unique. Examining war from several different categories and then explaining aerospace power's multiple roles, help determine the best way to use aerospace forces. The orchestration of a campaign, at the operational level, now holds the prominent place. It involves matching the correct mission, in the correct role, for the desired effect. Aerospace forces, AFM 1-1 concludes, may be used independently or in conjunction with other forces. This doctrine effectively defines the unique qualities of aerospace power and then correctly places aerospace forces in warfare's context.

In the future, aerospace power has a vital role in national military strategy. Just as doctrine shapes strategy, so to must the ways we think the best employment of aerospace power change as strategy evolves. The requirements of the four force packages contained in the Base Force concept, necessitate a flexible aerospace force; one able to affect warfare across the entire spectrum of conflict. Aerospace power has evolved, and Desert Storm demonstrated that it is a flexible and a potentially decisive instrument of national policy. It is more than airborne artillery, and it can simultaneously affect all levels of conflict.

Finally, AFM 1-1 goes beyond the traditional surface force doctrines that regard aerospace power's applicability as only useful in “roll back” campaigns or as a supporting element. While not yet broad enough to be joint doctrine, it could serve as the basis for a new, all-service, all-inclusive guide for the use of aerospace power in war. The new doctrine states that centralized control at the appropriate level, and an all-encompassing integrated targeting plan, has finally fulfilled the dream of the airpower theorists of old. This first documented Air

Force doctrine should stir debates and force a reexamination of aerospace power's role in all of warfare's mediums. Its assertions propose some new directions our future doctrine might take. The proof behind these assertions is in the most recent experiences obtained from the Persian Gulf War. The 100,000 airmen who fought, enhanced, or sustained the 38-day air war, paved the way for the 450,000-man army and naval force that defeated the 540,000 Iraqis in 100 hours of ground war. In every way, Air Force aerospace doctrine has matured through a storm.

NOTES

1 Headquarters, Department of the Air Force, Air Force Manual (AFM) 1 –1, Volumes 1 and 2, Basic Aerospace Doctrine of the United States Air Force (Washington D.C.: U.S. Government Printing Office: March 1992)The draft version was signed by the Chief of Staff of the Air Force and formally released on 3 March 1992.

2 Aerospace power is a difficult term to define. Following World War II, airpower was "the total aviation activity--civilian and military, commercial and private, potential as well as existing." See General Henry Arnold, "Air Power and the Future." The Impact of Air Power: National Security and World Politics. Eugene Emme editor, (Princeton: D. Van Nostrand, 1957), p. 305The 1955 AFM 1 - 2 defines air power as encompassing active and reserve military forces, their supporting facilities, civilian enterprise, the research and development system as well as trained personnel. See Headquarters, Department of the Air Force AFM 1 – 2, United States Air Force Basic Doctrine (Washington D.C.: U.S. Government Printing Press, 1 April 1955), p. 10With the ability to operate vehicles outside the atmosphere, the 1959 version of AFM 1-2 has the same definition for "aerospace" power as the 1955 version with the inclusion of "aeronautical and astronautical enterprises." See Headquarters, Department of the Air Force AFM 1 – 2, United States Air Force Basic Doctrine (Washington D.C.: U.S. Government Printing Press, 1 December 1959), p. 13The newest AFM 1 - 1 integrates airpower and space power into aerospace power and states that the same military activities can be performed in each environment," albeit with different platforms." See AFM 1-1, Vol 1, pp. v. and 5.

3 Colonel Dennis Drew and Doctor Donald Snow, Making Strategy: An Introduction to National Security Process and Problems (Maxwell AFB: Air University Press, 1988), p. 163To be fair, this sentence is taken out of context and Col. Drew goes on to explain that "beliefs" suggest an examination or interpretation of evidence, while "best" implies a guide for others. The point is, doctrine, especially among the military services, can range from an eleven paragraph document on naval doctrine described in Carl Builder's, The Masks of War (Baltimore. MD: The Johns Hopkins University Press, 1989), p. 82, to the eleven volume Fleet Marine Force doctrine.

4 Headquarters, Department of the Army, Field Manual (FM) 100-5, Operations (Washington D.C.: U.S. Government Printing Office, 1986), p. i.

5 Lieutenant Colonel Barry Watts and Major James Hale, "Doctrine: Mere Words or a Key to War-Fighting Competence?" Air University Review (Vol 35, September - October 1984), p. 6. See also Lt. Col. Watts, The Foundations of U.S. Air Doctrine: The Problems of Friction in War Maxwell AFB: Air University Press, 1984), p. 121Here Lt. Col. Watts feels military leaders must depend on a less mechanistic dependence on doctrine. He feels we may not even need an explicit conceptualization of war. Ibid.

6 The Joint Chiefs of Staff, Joint Publication 1 - 02, Dictionary of Military and Associated Terms (Washington D.C.: U.S. Government Printing Office, 1989), p. 118.

7 Headquarters, Department of the Air Force AFM 1 - 1, Basic Aerospace Doctrine of the United States Air Force (Washington D.C.: U.S. Government Printing Office, 16 March 1984), p. v.

8 See Michael Howard, "Military Science in an Age of Peace," Journal of the Royal United Services Institute for Defense Services (Vol 119, 1 March 1974), pp. 3 - 11Howard is "tempted to declare dogmatically" that whatever armed forces doctrine is, it will be wrong. He goes on to say "it doesn't really matter as long as the military has the capacity to quickly correct it when needed." Ibid., p. 7He feels it is the task of the military in an age of peace, to prevent doctrine from being too wrong. Ibid.

9 Politics, the economy, society, technology, and other factors have a significant impact on the building of doctrine, but it is what we have learned about the past and what we think about the future, that are the key inputs into building doctrine. I. B. Holley in "Of Saber Charges, Escort Fighters, and Spacecraft", Air University Review (Vol 34, September-October 1983), p. 4, states "Doctrine is, or should be, the product of experience. "The U.S. Air Force Air Command and Staff College uses a "Doctrine-Strategy" Link Model in their history curriculum which depicts how theory and history are the basis for doctrine, which in turn is used to build a strategy that provides results which is the history and also the catalyst for new theory in another doctrine cycle.

10 W. Frank Craven greatly develops this theme in his "Why Study History?" The Harmon Memorial Lectures in Military History 1959-1987, edited by Lt. Col. Harry Borowski (Washington D.C.: Offices of Air Force History, 1988), pp. 9-23He suggests history can give depth to our understanding, even in the "extraordinary age we live in." Ibid., p. 23.

11 See Colonel Dennis M. Drew, "The American Airpower Doctrine Dilemma," Air Power Doctrine, edited by Group Captain A.G.B. Vallance. (London: Her Majesty's Stationary Office, 1990), pp. 58 - 75Here he states how American airmen need to expand their horizons by looking at less well-known aerial engagements, like the Soviet and Japanese air operations in World War II, as well as applying lessons of guerrilla warfare, naval blockades, and ground maneuvers to the air. Ibid., p. 70.

12 See Gordon McCormick. "The Dynamics of Doctrina1 Change," Orbis (Vol 27, Summer 1983), p. 271.

13 In an as yet unpublished paper presented to the American Military Institute, in March 1991, Dr. Harold Winton states theory has five purposes: to define what exists under the area of discussion, to categorize the area into subordinate parts; to explain the relationships among the parts; to connect this area with other fields; and finally to anticipate (not predict!) what new relationships might occur. See "A Black Hole in the Wild Blue Yonder: The Need for a Comprehensive Theory of Air Power." Dr. Winton argues that theory is the link between history and the process of developing questions for analysis and formulating hypotheses. Ibid., p. 6.

14 It's interesting to note Giulio Douhet in his The Command of the Air, translated by Dino Ferrari (Washington D.C.: Office of Air Force History, 1983), uses time as one reason for selecting an air force over an army or navy. Very much like the French in World War II, if

your theory of what the next war is like is fundamentally wrong, you will not have time in modern warfare to recover prior to losing. See Robert Doughty, The Seeds of Disaster: The Development of French Army Doctrine, 1919-1939 (Camden, CN: Archon Books, 1985), p. xi. Military leaders are also concerned with public opinion not providing them the time to accomplish military objectives. A 26 Mar 1991 message from CINCUSAREUR (General Crosbie Saint) to CINCEUR (General Galvin) credits President Bush's early calling up of reserves in Desert Shield as a "major catalyst" in consolidating American public opinion firmly behind our strategy." (page 2, paragraph 3.. E.).

15 See Thomas Greer. "Air Arm Doctrinal Roots, 1917-1918," Military Affairs (Winter 1956), p. 204.

16 There were, even then, stirrings of the affect air forces could play. General John J. Pershing, commander of the American Expeditionary Force, conceded the primary role of the airplane was control of the air. See John J. Pershing, My Experiences in the World War, (New York: Slocum Press, 1931) p. 337In addition, Lee Kennett, The First Air War. 1214-1917 (New York: The Free Press, 1991), p. 117, attempts to relate control of the air, reconnaissance, and artillery together with the German loss of advantage at Verdun.

17 This circular was written by Lt. Col. William C. Sherman who was Chief of Staff of the First Army Air Service in November 1918. His Tenative Manual for the Employment of Air Service, was modified into this circular, which is the first written and sanctioned American air doctrine. See Maurer Maurer, editor, The U.S. Air Service in World War 1, Volume II (Washington D.C.: U.S. Government Printing Office, 1978), p. 313.

18 See Office of the Chief of Staff of Air Service, Training Regulation (TR) 440-15Air Tactics (Washington D.C.: 31 August 1922) and TR 440-15Fundamental Concepts of the Air Service, 1923The 26 January 1926 version of TR 440-15, Fundamental Principles for the Employment of the Air Service, stated the mission of the Air Service was "to assist the ground forces to gain strategic and tactical successes." Ibid., p. 1-3See also Robert Futrell, Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force 1907-1960, Volume I (Maxwell AFB: Air University Press, 1989), p. 50, for a concise summary of this period.

19 TR 440-15, Employment of the Air Forces of the Army (15 October 1935), p. 1-2.

20 Air Corps FM 1-5, Employment of Aviation of the Army, (Washington D.C.: U.S. Government Printing Office, 1940), p.10This manual superseded the 1935 TR 440-15.

21 See Bernard Brodie, Strategy in the Missile Age, (Princeton: Princeton University Press, 1965), p. 71Here he traces a memorandum dated 17 August 1917, from the Smuts committee reporting to the British Prime Minister. The independent use of air power was thought "to forecast the principal operations of war." Major General Hugh Trenchard, commander of the Royal Flying Corps, and later a Marshal of the Royal Air Force, is the officer credited with prompting this kind of thinking. Major William Mitchell visited Trenchard for fifteen days in May 1917His Chief of the Technical Section, Major Edgar Gorell, produced a memorandum dated 28 November 1917According to Maurer, U.S. Air Service, Vol 2, p. 141, this message was the first statement of the American strategic bombing concept. Gorell, was influenced by

Italian plane designer Gianni Caproni, a close friend of Douhet While Mitchell denies the influence of Douhet, it is obvious the Italian had a substantial affect on American theorists. See Futrell, Ideas, Vol 1, p. 69, for details showing how Douhet's works were in the Air Corps Tactical School's library as early as 1931See also Perry Smith, "Douhet and Mitchell: Some Reappraisals," Air University Review (September-October, 1967), pp. 99.

22 Douhet, Command of the Air. p. 24.

23 Ibid., P. 28.

24 Ibid., P. 32

25 Ibid., p. 34.

26 See Edward Warner, "Douhet, Mitchell, Seversky: Theories of Air Warfare," Makers of Modern Strategy: Military Thought From Machiavelli to Hitler, edited by Edward Meade Earl (New York: Atheneum, 1941), pp. 485 – 503, and David MacIsaac, "Voices From the Central Blue: The Air Power Theorists," Makers of Modern Strategy: Military Thought From Machiavelli to the Nuclear Age, edited by Peter Paret (Princeton: Princeton University Press, 1981), pp. 624 -647.

27 Giulio Douhet, "The War of 19--," in The Command of the Air, edited by Dino Ferrari (Washington D.C.: Office of Air Force History, 1983), p. 308.

28 Ibid., p. 362.

29 Maurer, U.S. Air Service, Vol 2, p. 313.

30 Ibid., p. 314.

31 William S. Mitchell, Winged Defense: The Development and Possibilities of Modern Air Power, Economc and Military (New York: G.P. Putnam's, 1925). p. 214.

32 William S. Mitchell, Skyways: A Book on Modern Aeronautics (Philadelphia: J.B. Lippincott, 1930), p. 225.

33 Alfred Hurley, Billy Mitchell: Crusader for Air Power (New York: Franklin Watts, 1964), p. 92Mitchell began his publicity campaign in October 1924 while serving as the Assistant Chief of Air Service in Washington D.C. He was the first American to publically articulate the long-hidden ideas of strategic bombardment and did so as President Coolidge's personal representative at the National Aeronautics Convention. Additionally, he sent a series of five articles to the Saturday Evening Post of which "Aeronautical Era," printed on 20 December 1924, was the fullest exposition of the potentials of strategic bombing yet presented to the American people. Because of these comments, and other unflattering remarks Mitchell directed at the War and Navy Departments, Secretary of War, John W. Weeks, did not recommend Mitchell's reappointment as second-in-command of the Air Service. Mitchell was transferred to San Antonio, Texas, wrote Winged Defense, and then charged the Navy and War Departments with "incompetency, criminal negligence, and almost treasonable

administration of the National Defense," following two naval air disasters in September 1925Ibid., p. 101President Coolidge preferred the charges which resulted in Mitchell's court-martial in October 1925.

34 See Futrell, Ideas. Vol 1, p. 62.

35 See James Cate, "Development of Air Doctrine: 1917 -1941." Air University Quarterly Review (Vol 1, Winter 1947), pp. 11 - 22Professor Cate uses several sources from lecture notes by General Haywood Hansell and Captain Harold George. See also lecture notes of Muir S. Fairchild, "National Economic Structure", Air Force Historical Research Agency (AFHRA) file 248.2019A-10, Maxwell AFB. AL.

36 Cate, Development of Air Doctrine, p. 19It is interesting to note, Secretary of the Air Force, Donald Rice, in his June 1990 White Paper, The Air Force and U.S. National Security: Global Reach - Global Power, stated the same thing. Rice feels, when interests of allies are threatened, bases will be made available. Ibid., p. 9.

37 Lecture notes of Captain George as reported in Cate, Development of Air Doctrine, p. 19. See also L.S. Kuter, ACTS lecture notes on "American Air Power--School Theories versus World War Facts," AFHRA file 248.11-0 to 4.

38 Haywood Hansell Jr., The Strategic Air War Against Germany and Japan: A Memoir (Washington D.C.: Office of Air Force History, 1986), pp. 18 - 19General Hansell goes into some depth on exactly which targets and how their destruction would affect the capability or the will of the enemy.

39 Futrell, Ideas, Vol 1, p. 108.

40 See Air Staff, "Graphic Presentation and a Brief," Air War Plans Division - 1 (Washington D.C.: On file in AFHRA file 148.82-1, Pt. 1), Table 1.

41 Ibid., Table 1., and Tab 1.

42 See Sir Arthur Harris, Bomber Offensive (London: Greenhill Books, 1947), passim. The Marshal of the Royal Air Force firmly believed in the concept of strategic bombardment. The Smuts report (see footnote 21) stated airpower could and would be used strategically. Harris mentions how in 1922 air control was used in Irak (sic). Ibid., p. 54See also Richard Hallion, Strike From the Sky: The History of Battlefield Air Attack. 1911_-_1945 (Washington D.C.: Smithsonian Institute, 1989), pp. 59 - 66 for a summary of the British experience in air control. A number of political, technological, and physical problems resulted in the British adopting a night area bombing doctrine. First, the early English bombers were "cold meat" for German fighters in daytime. Harris, Bomber Offensive, p. 39The only way to protect the limited number of aircraft, was to fly them at night. In addition, studies in England had shown precision bombing was not possible during the day, much less at night, because of "technical and training" reasons. Ibid., p. 77Finally, Prime Minister Churchill, as well as members of the British Air Staff, favored indiscriminate bombing in retaliation for the "Blitz." See also R. J. Overy, The Air War: 1939 - 1945 (Chelsea MI: Scarborough House, 1991), p. 38British doctrine therefore evolved into night, area bombing in an attempt to destroy civilian morale.

43 Doctrine is, after all, more than just a product of history and theory. In America, distaste for the civilian bombing of Guernica, Warsaw, and Rotterdam had politically ruled out saturation bombing. See Cate, Development of Air Doctrine, p. 21Technologically speaking, industry had not yet provided the same advantages to fighter aviation that bombers enjoyed during the 1930s, See Lt. Col. Phillip Meilinger "The Impact of Technology and Design Choice on the Development of U.S. Fighter Aircraft." Journal of American Aviation Historical Society (Spring 1991), pp. 60 - 69However, industry had provided the superchargers necessary to fly above the effective range of antiaircraft artillery while American bombsights (Norden and Sperry) seemed capable of "pickle barrel" precision, see Futrell, Ideas Vol 1. p. 81.

44 See Air Staff, "Air Estimate of the Situation and Recommendations for the Conduct of the War," Air War Plans Division-4, (Washington D.C.: On file in the AFHRA file K1012), frame 101-102.

45 Ibid.

46 Ibid.

47 See Wesley Craven and James Cate, editors, The Army Air Forces in World War II, Vol 1 (Chicago: University of Chicago Press, 1951), pp 237-251.

48 Quoted in Hansell, Strategic Air War, p. 63.

49 See Air Staff, "Requirements for Air Ascendancy." Air War Plans Division-42 (Washington D.C.: On file in the AFHRA file 145.82-42), Tab A.

50 Ibid.

51 See Overy, The Air War, pp. 73 -78See also Hansell, Strategic Air War, pp. 72 -82Here Hansell goes in some depth on different Allied interpretations of what exactly the CBO meant.

52 See Haywood Hansell Jr., "USAAF Plans and Strategic Effects." in Impact: The Army Air Forces' Confidential Picture History of World War II, Vol V (Harrisburg, PA: Historical Times Inc., 1982), p. 85.

53 However, Hansell in his Strategic Air War, p. 60, states the omission of the transportation system and electric plants were costly errors.

54 See Craven and Cate, Army Air Forces. Vol 2, pp. 492 and 728Quadrant is discussed first followed by Sextant.

55 See Hansell, Strategic Air War, p. 83.

56 See FM 1-5, p. 11

57 Ibid., p. 5Although AWPD-1 was "approved" by the Army Chief of Staff, General George Marshall, and Secretary of War, Henry Stimson, and the concept of independent strategic

bombing was being taught at the ACTS, official "sanctioned" doctrine was contained in FMs 1-5 and 31-35See the 1 November 1935, ACTS Bombardment Text (Maxwell AFB: AFHRA file 248.101-9), p. 1It could be argued however, that airpower doctrine was indeed in the process of evolving and these air plans reflected de facto, if not de jure, doctrinal beliefs.

58 War Department Field Manual 31-35, Aviation in Support of Ground Forces (Washington D.C., U.S. Government Printing Office, 9 April 1942). p. 9.

59 For a concise review of the Battle of the Kasserine Pass, see Hallion, Strike From the Sky, pp. 169-175, or USAAF XII Air Support Command, Report on Operations Conducted by XII Air Support Command, USAAF, Tunisia, 13 Jan 43 to 9 Apr 43, on file in AFHRA file K170.42190 or Robert Futrell "Air Power Lessons of World War II." Air Force/Space Digest (September 1965), pp. 488-49The Army review of Operations conducted in the Kasserine Pass can be found in George Howe, The United States Army in World War II: Mediterranean Theater of Operations, Volume 1, Northwest Africa: Seizing the Initiative in the West. (Washington D.C.: U.S. Government Printing Office, 1991), pp. 438-458.

60 War Department Field Manual 100-20, Command and Employment of Air Power, (Washington D.C., U.S. Government Printing Office, 21 July 1943), p. 1.

61 Ibid., p. 9.

62 Ibid.

63 See Craven and Cate, Army Air Forces, Vol 2, p. 321.

64 Hansell, Strategic Air War, p. 83.

65 See Richard H. Kohn and Joseph P. Harahan, General Editors, Strategic Air Warfare: An Interview with Generals Curtis E. LeMay, Leon W. Johnson, David A. Burchinel, and Jack J. Catton (Washington D.C.: Office of Air Force History, 1988) pp. 40-42. Here Generals LeMay and Johnson, describe the morale of their units. During the winter and spring of 1943, one unit lost twenty of its original force of twenty-seven B-24s. In another squadron, of the ninety crewmen who arrived in England in November 1942, fewer than ten remained alive by mid-May of 1943.

66 See William Emerson, "Operation Pointblank: A Tale of Bombers and Fighters," The Harmon Memorial Lectures In Military History 1959 – 1987, edited by Lieutenant Colonel Harry Borowski. (Washington D.C.: Office of Air Force History, 1988), pp. 442 -443.

67 Ibid., p. 445.

68 Fighter ranges are from Emerson, Harmon Lectures, where he cites several USAF Historical Studies. Ibid., p. 472, notes 27 and 31The overall bomber attrition rate being acceptable, is from a comment made by General Ira Eaker as recorded in, Williamson Murry, Strategy for Defeat: The Luftwaffe, 1933 -1945 (Maxwell AFB, Air University Press, 1983), p. 170See also a number of charts depicting bomber attrition. Ibid., pp. 175 - 181.

69 The United States Strategic Bombing Surveys (USSBS): Summary Reports (Europe and The Pacific) (Maxwell AFB: Air University Press, 1987), pp. 84 - 85.

70 See Craven and Cate, Army Air Forces, Vol 5, pp. 568 and 605.

71 USSBS, Summary Reports (The Pacific), p. 85.

72 Futrell, Ideas, Vol 1, p. 144.

73 Ibid., pp. 144 -145See also the forward in each USSBS Survey for a more detailed discussion. USSBS, Summary Reports, pp. 3 - 4 in The European War, and pp. 46 - 47 in The Pacific War. In addition, see David MacIsaac, Strategic Bombing in World War Two: The Story of the United States Strategic Bombing Survey (New York: Garland Publishing. 1976), passim, for an in-depth account on the survey.

74 Major General Orvil Anderson, cited in Futrell, Ideas, Vol 1, p. 147.

75 Bernard Brodie, "The Heritage of Douhet," Air University Quarterly Review (Vol 6, Summer 1953), pp. 126 - 127.

76 General Carl Spaatz, "If We Should Ever Have to Fight Again," Life (5 July 1948), p. 35. See also his comments in "Strategic Air Power: Fulfillment of a Concept," Foreign Affairs (Vol 3, April 1946), pp. 383 - 396.

77 Spaatz, If We Should Ever Have to Fight Again, p. 35.

78 See Hansell, Strategic Air War, p. 263An expanded account on the virtues of strategic bombing can be found in USSBS, Summary Reports (European War), pp. 40 -42, and USSBS, Summary Reports (Pacific War), pp. 115 -120.

79 Lieutenant Colonel Joseph Dickman, "Douhet and the Future," Air University Quarterly Review (Vol 2, Summer 1948), pp. 3 -15.

80 USSBS, Summary Reports (Pacific War), p. 113.

81 In September 1954 Air University Commander General Laurence Kuter, addressed the NATO Defense College in Paris, France. He traced the spiral of man's advancement in powered flight and proposed the fundamentals for air doctrine in a "Jetomic Age." His remarks were reprinted. See General Laurence Kuter, "An Air Perspective in the Jetomic Age," Air University Quarterly Review (Spring 1956), pp. 2-17 and 108-123.

82 See Headquarters Department of the Army, Army Air Forces Regulation 20-61, Army Air Forces Missions Summary (3 June 1946), p. 7In addition, Futrell, Ideas, Vol 1, p. 365 notes the reputation of ACTS while Robert T. Finney, History of the Air Corps Tactical School, 1920-1940, (Maxwell AFB: USAF Historical Division, USAF Historical Studies. No. 100, March 1955), describes the history, growth, reputation, and final dissolution of ACTS in 1941.

83 Memorandum by Brigadier General Francis Griswold to Chief of Air Staff, Army Air Forces as quoted in Futrell, Ideas. Vol 1, p. 366.

84 See Department of the Air Force, AFM 1-2, United States Air Force Basic Doctrine, (1 April 1953), pp. 1 and 17, and Department of the Air Force, AFM 1-8, Strategic Air Operations, (11 May 1954), pp. 4-6For a quick review of this doctrinal series, see Colonel Royal H. Roussel, "The Air Force Doctrinal Manuals," Air University Quarterly Review (Spring 1954), pp. 126-131.

85 See Department of Defense, Semiannual Report of the Secretary of Defense and the Semiannual Reports of the Secretary of the Army, Secretary of the Navy, and Secretary of the Air Force, January 1 to June 30, 1953 (Washington D.C.: U.S. Government Printing Office, 1955), p. 9.

86 Brigadier General Dale O. Smith, USAF, U.S. Military Doctrine: A Study and Appraisal (New York: Duell, Sloan and Pearce, 1955), pp. 168-169.

87 See Futrell, Ideas, Vol 1, p. 447 and Drew. Two Decades, p. 5All four versions of U.S. Air Force basic doctrine from 1935 to 1964, professed strategic bombardment as being the most decisive use of aerospace power. See AFM 1-2, March 1953, April 1954, 1955, and December 1959All agree in their sections entitled "Employment of Air (Aerospace) Power in War." Col. Drew also feels that the 1964 version of AFM 1-1 paid only "lip service to anything more general than nuclear warfare." See Drew, Two Decades, p. 6 and AFM 1-1, August 1964, pp. 3-1 to 7-2. While counterinsurgency operations are discussed for the first time, the means to defeat an enemy are centered on the ability to destroy the utility of his military forces by targeting select components of the country's military-economic-industrial complex. Ibid., p. 7-1.

88 See Robert Futrell, "The Influence of the Air Power Concept on Air Force Planning, 1945-1962," in Military Planning in the Twentieth Century: Proceedings of the Eleventh Military History Symposium at the U.S. Air Force Academy, Colonel Harry Borowski, editor (Washington D.C.: Office of Air Force History. 1986), p. 253Here Dr. Futrell describes how Kennedy's policy did not change it's focus from "a bombs-on-target concept of air power." Ibid.

89 See Department of Defense, United States-Vietnam Relations, 1945-1967, Vol IV (Washington D.C.: U.S. Government Printing Office, 1971), p. 3.

90 Ibid.

91 See William Bundy, "Draft Position Paper on Southeast Asia," in The Pentagon Papers: The Defense Department History of United States Decision making in Vietnam, edited by Gerald Gold, Allan M. Siegel, and Samuel Abt. (New York: Bantam Books, 1971), pp. 373-378.

92 See Mark Clodfelter's, Limits of Airpower: The American Bombing of North Vietnam (New York: The Free Press. 1989), pp. 39-72 for an in-depth investigation of these events. In addition, Maj. Clodfelter's unpublished paper, "Precursors to the Storm: An Overview of

American Air Campaign Planning, 1917-1964," pp. 36-42, prepared for the Gulf War Air Power Survey (GWAPS), presents a concise history of this period.

93 North Vietnam was anything but a modern industrial nation. Initial studies only found eight sizeable industrial targets making only minor contributions to their war efforts. Most military equipment was imported. See Raphael Littauer and Norman Uphoff, The Air War in Indochina (Boston: Beacon Press, 1972), p. 37See also Clodfelter, Limits of Airpower, pp. 85-87.

94 There are some airmen who still blame the failure of Rolling Thunder on timid civilian leaders. See Kohn, Strategic Air Warfare, pp. 124-131Here Gen. LeMay was convinced (1988) that bombing would have ended the war in any ten day period, but the Air Force was not allowed to bomb the desired target list. Gen. Catton felt massive bombing of these targets would have saved lives, dollars, and many years. Gen. Burchinal felt incendiary bombing of North Vietnamese cities, like Japan, would have ended the war. Ibid, p. 129However, there is no empirical data to support the idea that had Rolling Thunder been "turned loose", the outcome would have been different. Mark Clodfelter in The Limits of Airpower, pp. 203-210, feels that the reason intense bombing in the Nixon era, Operations Linebackers I and II, worked was because the North Vietnamese were by then waging a large-scale conventional war rather than sponsoring an insurgency. In addition, he feels Nixon's rapprochement with the People's Republic of China and the Soviet Union, eliminated those countries involvement in the conflict. Finally, Nixon's more limited goal of leaving South Vietnam with less than total victory created an atmosphere favoring bombing. See also Mark Clodfelter. "Of Demons, Storms, and Thunder," Airpower Journal (Winter 1991), p. 19.

95 See Col. Drew, Two Decades, p. 11.

96 See the 1984 version of AFM 1-1, p. 2-11.

97 Remark by Gen. LeMay in Kohn, Strategic Air Warfare, p. 130See also Maj. Gen. Haywood Hansell, "Conventional Strategic Air Warfare," Strategic Review (Fall 1988), p. 7.

98 See Colonel Wayne Possehl, "To Fly and Fight at the Operational Level," Airpower Journal (Vol 11, Winter 1988), pp. 20 - 28The classic book on air campaign planning remains Colonel John Warden, The Air Campaign: Planning for Combat (New York: Pergamon Press. 1989).

99 Center for Aerospace Doctrine, Research, and Education (CADRE) Draft AFM 1-1, p. iii, June 1991This sentence was not included in the final 1992 version.

100 AFM 1 – 1, Vol 1, p.v.

101 Ibid., p. vii.

102 Ibid., p. 1See also Clausewitz, On War, pp. 87 and 75While true students of Clausewitz will notice this second portion is from his war in theory section, they should also remember the military object in war remains the same in theory as well as reality.

103 See B. H. Liddell Hart, Strategy (London: Meridian Press, 1991), p. 353.

104 AFM 1-1, Vol 1, p. 1.

105 Ibid., See also FM 100 – 5, Operations, pp. 2 - 3.

106 AFM 1-1, Vol 1. p. 2Even the newest student to Clausewitz should recognize these elements as those differentiating "real" war from war in theory. See Clausewitz, On War, pp. 86 and 119 - 121.

107 AFM l-1,Vol 1, p. 2 and AFM 1-1, Vol 2, essay C, pp. 17-24.

108AFM 1-1, Vol 1, pp. 2 - 3.

109 Ibid.

110 Ibid., p. 5.

111 Ibid.

112 Ibid., Figure 2-1, p. 7, for a concise summary, and Chapter Two for indepth definitions.

113 See Major Grover Myers, Aerospace Power: The Case for Indivisible Application (Maxwell AFB: Air University Press, Sep 1986)Maj. Myers was just slightly ahead of his time in proposing a redefinition along these lines. This idea is not new however, General Hoyt Vandenburg opposed the strategic/tactical distinctions in 1950'sSee his comments in Futrell, Ideas, Vol 1, p. 381.

114 Figure 2-2 in AFM 1-1, Vol 1, p. 8., and essay M in AFM 1-1, Vol 2, pp. 113 - 124.

115 The operational level of war is the area where campaigns and major operations are planned and executed. See JCS Pub 1 – 02, Dictionary, p. 264Activities at this level link tactics to strategy by establishing objectives which sequence battles toward attaining strategic successes. While occurring normally in one theater, aerospace power allows out-of-theater stationed assets to have operational affects within the theater of interest. See Futrell, Ideas, Vol 1,. pp. 381 - 384 for an early doctrinal discussion on the flexibility of aerospace power within a theater.

116 The term decisive is difficult to adequately define. In this context, decisive means to be the critical element in the conduct of war. Depending on the scenario, aerospace power may or may not be the critical element for any given conflict. If it is absolutely necessary for the successful resolution on favorable terms, then aerospace power is the decisive force for that particular military engagement--at whatever level (strategic, operational, or tactical) involved. Aerospace power will always have the ability to be a decisive force, because of its vastly superior speed, range, and flexibility over surface forces. In addition, aerospace power is now the dominant force, in most circumstances, in war. In the final analysis, aerospace power clearly influences and may dominate, but surface forces are still required to terminate a conflict. See Col. Drew, "4 Air-power Lessons Obvious from Gulf War," Air Force Times (30 September 1991), p. 27, Lt. Col. Bingham, "Air Power in Desert Storm," Air Power Journal (Winter 1991), p. 40, and Overy, The Air War, p. 203.

117 AFM 1-1, Vol 1, p. 9.

118 The term air component commander is, in the Joint community, the Joint Force Air Component Commander (JFACC)See JCS Test Pub 3 - 0, Doctrine for Unified and Joint Operations (Washington D.C.: U.S. Government Printing Office, January 1990), p. 3-01.1See also, Major John Valliere, "Stop Quibbling: Win the War," Naval Institute Proceedings (December 1990), pp. 38-39, for a short history of the JFACC.

119 See AFM 1-1, Vol 1, p. 10 and AFM 1-1, Vol 2, essay N, pp. 125-134.

120 Notice a backing away from the absolute requirement of air superiority as the sine qua non of successful operations. See Von Hardesty, "Roles and Missions: Soviet Tactical Air Power in the Second Period of the Great War," Transformation in Russian and Soviet Mi1itary History (Washington D.C.: Office of Air Force History, 1990), pp. 161 - 163Air Superiority has limits. There may be times when a country begins with de facto air superiority. The important item is the realization aerospace control is an enabling means. See AFM 1-1, Vol 1, p. 10, and AFM 1-1, Vol 2, essay 0, pp. 135-146.

121 Ibid., p. 12, and AFM 1-1, Vol 2, essay P, pp. 147-160In Volume II, targets for strategic attacks fall into two categories: attacks directed against an enemy's war sustaining capability or will. Given the elusive nature of the last target set, doctrine now states "commanders should probably focus their initial efforts on attacks against the first element." Ibid., p. 151.

122 Ibid., See also essay P, p. 149The idea is now that strategic attacks are focused on centers of gravity instead of solely the economic fabric of a society. Colonel John Warden presented his "Five Strategic Ring Theory" in a paper presented to Tufts University. See Clodfelter, Demons, p. 23 for a concise summary of the strategy which is fully in concert with this new doctrine.

123 AFM 1-1, Vol 1, pp. 15 - 16See also AFM 1-1, Vol 2, essay U, pp. 209-218, and Colonel Dennis Drew, "Joint Operations: The View Looks Different from 10.000 Feet," Airpower Journal (Vol 11, Fall 1988), pp. 4 - 16Here Col Drew identifies the focus of airmen as being different from soldiers or sailors. Where soldiers are, by necessity, concerned with the "right-now battle", sailors think less about battles and more about war. However, sailors are still constrained to the surface so their focus is still not as broad as the airman's. Ibid. These new eight principals are "not presented as doctrine", rather they "illustrate the mindset airmen should develop." AFM 1-1, Vol 1, p. 15.

124 See Ibid., p. 17, and DOD Directive 5100.1 for the primary functions of the Air Force.

125 See AFM 1-1, Vol 1, p. 18

126 As a refresher, Colonel Drew feels a good doctrine must first analyze what makes aerospace power unique. Next, doctrine must integrate the capabilities and limitations of aerospace power with the realities of war. History and theory must be used to place this power in its proper context. The third requirement is that convincing doctrine must be provable through either convincing evidence or irrefutable logic. See Drew, Air Power Doctrine. pp. 71 - 72.

127 Air forces divided among Army commanders was one reason given for the poor performance of II Corps at the Kasserine Pass. FM 100 - 20 separated the air forces into their own organizations. The centralized control resulting from this restructuring was a hallmark of the success of the Ninth Air Force in France. See Hallion, Strike From the Sky, pp. 167 - 172.

128 AFM 1-1, Vol 1, p. 8 and AFM 1-1, Vol 2, essay M, pp. 120 - 121.

129 The ability to base short range aircraft is a hot topic. Secretary of the Air Force, Rice, feels when America's global interests are threatened, bases will be available(see footnote 36)Others feel airfields are the linchpins for aerospace power's use. See Lieutenant Colonel Price Bingham, "Operational Art and Runway Requirements." Airpower Journal (Fall 1988), pp. 57 -63., and Group Captain A.G.B. Vallance, "The Conceptual Structure of Air Power," Air Power Doctrine, edited by Group Captain Vallance (London: Her Majesty's Stationary Office, 1980), p. 4.

130 Precision munitions are a perfect example. What took 4,500 B-17's dropping 9,000 bombs in World War II, required ninety-five F-105 missions using 190 weapons in Vietnam. One F-117A in Desert Storm did the same degree of damage with one bomb. See Douglas Pasternak, "Technology's Other Payoff," U. S. News and World Report (11 February 1991), p. 27See also Clodfelter, Demons. pp. 25-26 where he details how "the merger of stealth and precision guided munitions had a devastating impact on the Iraqi war effort."

131 While every effort will be made not to "cook the solution," it is difficult not to with such a resounding success. There are some who feel Desert Storm is not a "prototype for the future", so lessons learned may be very circumspect. See General John Loh's briefing package, "Developing Technologies for Tomorrow's Operational Requirements." Others feel the Persian Gulf Conflict was no more unique than any other war we've ever fought. See Colonel Dennis Drew, 4 Air-power Lessons, p. 27.

132 Dick Cheney, Conduct of the Persian Gulf Conflict: An Interim Report to Congress (Washington D.C.: Department of Defense, July 1991), p. 2-1Since all primary material in the Historical Research Agency file 178.81 is still classified, this and other comments from Governmental and Military leaders will be the main sources of information.

133 Donald Rice, "Global Reach—Global Power: One Year Removed" Comments presented to the National Security Forum (Maxwell AFB: U.S. Government Printing Office, 7 June 1991), p. 1.

134 Cheney, Conduct of the Persian Gulf Conflict, p.3-1 to 3-3.

135 Ibid.

136 Ibid.

137 Ibid., p. 2-2See also James Blackwell, Thunder in the Desert: The Strategy and Tactics of the Persian Gulf War (New York: Bantam Books, October 1991), pp. 94 -97Here he charts the types of aircraft and time of arrival, chronologically and notes the flexible nature of their abilities during the critical month of August.

138 Cheney's report to Congress is very thorough. He describes how ten areas of Iraqi vulnerabilities were identified and reduced to the following three centers of gravity: 1) Command and control; 2) Weapons of mass destruction; and 3) The Republican Guard. From these centers, a four-phase theater campaign plan was developed. Aerospace power was involved in all four phases, the first three almost exclusively. Aerospace forces operated independently in these while it was planned for complementary operations in the last. The aerospace portion of the theater plan had five goals, each with a set of sometimes overlapping targets. These goals were, in order of priority: 1) Isolate and incapacitate the Iraqi regime; 2) Gain and maintain air supremacy; 3) Destroy known nuclear, biological, and chemical facilities; 4) Eliminate Iraq's offensive military capability; and 5) Render the Iraqi army in Kuwait ineffective. The twelve target sets did not include targets primarily designed to break down civilian morale. Ibid., pp. 2-1 to 2-6There are some who believe however, Iraq was tailor made for attacks directed simultaneously against both the war making capability and will to resist. See Clodfelter, Demons, p. 25In addition, there did appear to be some hope aerospace alone could independently achieve the political objectives. Cheney, Conduct of the Persian Gulf Conflict, pp. 2-1 to 2-6 Cheney reports, "Coalition political leaders and commanders may have held some hope that the air phases might have caused Saddam to agree to demands without the need for a ground offensive, …" Ibid., p. 104.

139 Much has been made of the controversy surrounding the development of the air plan. In 1989, Chairman of the Joint Chiefs of Staff, General Colin Powell, directed CENTCOM to revise the operations plan (OPLAN) dealing with the rapid deployment to the Southwest Asia area. The idea was to refocus the plan away from the old Soviet threat toward the one represented by Iraq. The new plan, OPLAN 1002-90, was wargammed in June 1990This exercise uncovered a number of problems which were in the process of being corrected by CENTCOM when the crisis erupted. Colonel John Warden, acting in his capacity of Deputy Director for Strategy, Doctrine, and Plans (XOXW) on the Air Force Staff, realized he had some ideas which could quickly resolve the problems. He, with his intimate knowledge of aerospace combat planning, along with his "Project Checkmate shop" (XOXWF-now called Force Planning), developed another plan. Called "Instant Thunder," this plan was briefed to General Schwarzkopf during the second week of August and completed in early September with another briefing delivered to Lieutenant General Charles Horner, the CENTCOM JFACC. The plan was accepted and then was sent to Saudi Arabia where the concepts were turned into mission sorties in the "Black Hole" of CENTCOM Forward Headquarters. See Blackwell, Thunder in the Desert, pp. 82 - 118, also Norman Friedman, Desert Victory: The War for Kuwait (Annapolis MD: Naval Institute Press, 1991), pp. 169 - 170; or Lieutenant General Charles Horner. "The Air Campaign," Military Review (Fort Leavenworth, KS: USACGSC, Vol 71, September 1991), pp. 18 - 19, or Tom Mathews. "The Secret History of the War," Newsweek (18 March 1991), pp. 28 - 37, or James Cayne, "Plan of Attack," Air Force Magazine(April 1992), pp. 40-46.

140 Cheney, Conduct of the Persian Gulf Conflict, pp. 2-5 to 2-7.

141 Ibid., 4-2 to 4-6For the strategic attacks, over 1,300 sorties were flown in the first twenty-four hours. Iraqi communications and command and control functions were judged ineffective above brigade headquarters. The Iraqi air defense system was not able to coordinate a defense. The electrical distribution system of the country was shut down for over ninety-five

percent of the military headquarters. Oil refining and production capabilities were eliminated. Phase two targets were similarly destroyed. There were no coalition losses to aerial combat, and of over 109,000 fixed-wing sorties flown, the total combat attrition rate was approximately 0.03%Iraqi aircraft refused to fight and only flew to Iran in an attempt to escape the shelter bombing campaign conducted by coalition aerospace forces. Taking out Iraq's reconnaissance assets a1lowed the famous "Hai1 Mary" redeployment of the surface forces. During phase three, over 35,000 attack sorties were flown, including over 5,600 missions directed by "tactical" and "strategic" aircraft against the Republican Guard. Interdiction efforts made forty-two of the fifty-four road/railroad bridges in the area impassible. Of the forty-three divisions deployed in Kuwait, all were judged to be below fifty percent effective by the time phase four occurred. See also Department of the Air Force White Paper, Air Force Performance in Desert Storm, (April 1991), pp. 1 - 3.

142 Comments made by CENTCOM Commander, General H. Norman Schwarzkopf, "Central Command Briefing," as recorded in Military Review (Fort Leavenworth, KS: USACGSC, Vol 71, September 1991), p. 88U.S. Air Force pilots flew 1,485 of the total 4,515 coalition sorties defined as Close Air Support. The largest confirmed tank killer during the operation, was the Maverick missile fired from an A-10 or F-16This weapon was closely followed by the F-111 using a laser guided 500 pound bomb to "plink tanks" during phase three. In all, aerospace assets were credited with contributing to the destruction of over 3,500 tanks, 2,600 artillery pieces, and 2,400 armored vehicles.

143 White Paper, Air Force Performance, pp. 7 - 9.

144 Ibid., p. 9. and Friedman, Desert Victory, pp. 147 - 160Friedman also reports that sorties were actually canceled due to a lack of electronic combat warfare aircraft. Ibid.

145 White Paper, Air Force Performance, p. 9.

146 Ibid., In addition, see William Suit, "The Logistics of Air Power Projection," Air Power Historian (Fall 1991), pp. 22 and 25Only about 67,000 tons of the 556,900 tons of munitions brought to Saudi Arabia were used. Ibid., p. 25Mr. Suit cites his evidence as being from a staff summary sheet prepared for the Air Force Logistics Command's commander, dated 1 May 1991.

147 See AFM 1-1, Vol 1, p. 11There are some who say not only was aerospace power decisive, but that it also now "dominates modern warfare." See Drew, 4 Air-power Lessons, p. 27Even Col. Drew would agree that while aerospace power may dominate, all services were still necessary for the successful outcome in Kuwait. See Blackwell, Thunder in the Desert, p. 222.

148 Kinzey, Bert, The Fury of Desert Storm: The Air Campaign (Blue Ridge, PA: TAB Books. 1991), p. 28.

149 See White Paper, Air Force Performance, p. 8The equivalent of moving Oklahoma City, all its people, vehicles, food, and household goods, was accomplished by air during the deployment.

150 Ibid., p. 6.

151 AFM 1-1, Vol 1, p. 13.

152 Original facts concerning the Special Operations (SOF) controversy came to light during discussions with Lieutenant Colonel Price T. Bingham, USAF. Lt Col. Bingham is assigned to the Center of Aerospace Doctrine, Research and Education (CADRE) at Air University, Maxwell AFB, AL. He was instrumental in developing the new AFM 1-1 and authored several of the essays now included in AFM 1-1 Volume II. Another indication of the last minute distress at how to describe SOF is that the supposedly final draft version, dated November 1991, was only changed in the area of special operations.

153 See AFM 1-1, Vol 1, p. 6.

154 Ibid.

155 Ibid., p. 7, Table 2-1; p. 13, and p. 18See also AFM 1-1, Vol 2, p. 109.

156 AFM 1-1, Vol 1, p. 14.

157 See Ibid., p. 8; AFM 1-1, Vol 2, essay M, pp. 113-115; and essay N, p. 130.

158 See Cheney, Conduct of the Persian Gulf Conflict, p. 5-5. In all, a total of seven CSAR missions were launched resulting in three successful "saves". The report goes on to state that CSAR presented SOF planners (there was no official JSOACC in Desert Storm) with situations where the relatively scarce SOF aircraft had to be diverted from other missions occurring simultaneously. Ibid.

159 See AFM 1-1, Vol 1 p. 11, and AFM 1-1, Vol 2, essay 0, p. 142.

160 See AFM 1-1, Vol 1, p. 15, and AEM 1-1, Vol Z, essay T, p. 200.

161 AFM 1-1, Vol 1, p. 11.

162 Ibid.

163 The ideas for this critique are based from Group Captain M. B. Elsam, Air Defense, (Maclean, VA: Pergamon-Brassey's International Defense), 1989The realization of the integration required between the Army and Air Force on airbase defense comes from watching the attempt at this while serving in a command post during NATO and American exercises. The basic role of surface-to-air missile defense is a mission which has been given to the Army. See Richard I. Wolf, The United States Air Force: Basic Documents on Roles and Missions (Washington D.C.: Office of Air Force History, 1987) for the Key West Agreement; Secretary of Defense Louis Johnson's 1950 Memorandum on Guided Missiles; the Air Force Chief of Staff, General Hoyt Vandenberg and Army Chief of Staff, General Lawton Collins 1950 Agreement; the Air Force Chief of Staff, General Curtis LeMay and Army Chief of Staff, General George Decker 1962 Overseas Air Defense Agreement; and the U.S. Army/U.S. Air Force Memorandum of Agreement (31 Initiatives) of 1984The Key West Agreement was further clarified by the Department of Defense Directive 5100.1 in 1958 which established Service primary and secondary functions. The Army retained the primary

function of point air defense. Ibid., p. 339. A memorandum by the Secretary of Defense not rescinded by DOD 5100.1, gave the Air Force responsibility for area defense. See Headquarters, Department of the Air force, AFR 55-18, Functions of the Department of Defense and Its Major Components (Washington D.C.: U.S. Government Printing Office), 24 October 1975, p. 22In essence, the Air Force has responsibility for area defense with both missile, air, and space assets as well as internal security within the "fence" of its airbases. Sandwiched between these is the Army with surface-to-air missiles and antiaircraft artillery providing point defense.

164 The first quotation is from AFM 1-1, Vol 1, p. 1., while the second is from Ibid., p. 9The assertion is my own.

165 See Ibid., pp. 9-10.

166 See AFM 1-1, Vol 2, essay N, p. 128Here it states "the form of war is a crucial factor in determining the degree of political involvement in the orchestration of all military forces." Ibid.

167 See Ibid., Overview, pp. v-xiii. The request for clear political objectives is stridently clear as well as the wish for being allowed to use all appropriate means. In addition, essay A does discuss how limited political objectives are complicated since they contain both positive goals (those that require the use of military force) and negative (those that restrict the military's use) ones as well. Ibid., p. 3Very obviously taken from Mark Clodfelter's, Limits of Airpower, this essay still does not deal with the necessity of considering political restraints when employing aerospace forces. Finally, nowhere is guidance provided on how aerospace leaders are to deal with constraints they feel are over-burdening. The case of General John Lavelle, former 7th Air Force Commander in Vietnam, springs to mind. Feeling political restrictions were endangering his men, Gen. Lavelle ordered approximately twenty-eight unauthorized strikes on North Vietnamese targets in 1972. See Gordon Ginsburg, The Lavelle Case: Crisis in Integrity, (Maxwell AFB. AL: Air War College Professional Study, 1974) passim and the United States Congress, Nomination of John D. Lavelle, General Creighton W. Abrams, and Admiral John J. McCain Hearings, Ninety-Second Congress (Washington D.C.: U.S. Government Printing Office, 1972). passim.

168 See JCS Pub 1-02, pp. 204 and 355-356.

169 Ibid., p. 184.

170 See AFM 1-1, Vol 1, p. 14.

171 AFM 1-1, Vol 2, pp. 192-193.

172 The lack of accurate and timely bomb damage assessment is discussed in Cheney, Conduct of the Persian Gulf Conflict, pp. 14-1 to 14-6The Tactical Exploitation of National Capabilities (TENCAP) is the on-going means the Air Force is attempting to use space to enhance the effectiveness of aircraft employment. See Robert O. Work, Toward a National Space Warfighting Architecture (Monterey, CA: Naval Post Graduate School, 1990) or Francis X. Kane and General Stewart C. Meyer, Innovative Concepts for Force Support From

Space (San Antonio. TX: Final Report, 1991) For hardware changes in aircraft, "Fastball" is the F-16 cockpit display of intelligence in near real time currently being tested at Eglin AFB, FL. See Stephen M. Hardy, "Air Force Hits the Intelligence Fastball," Journal of Electronic Defense (January 1992), p. 29The point is these programs are being accomplished as well as a whole new Major Command being created, the Air Force Intelligence Command, without a doctrinal statement about intelligence.

173 See George Bush, National Security Strategy of the United States, August 1991 (Washington D.C.: U.S. Government Printing Office, 1991), passim.

174 Ibid., p. 1.

175 Ibid., pp. 3 - 4.

176 Ibid.

177 Colin Powell, General, USA, National Military Strategy of the United States, January 1992 (Washington D.C.: U.S. Government Printing Office, 1992), passim.

178 Ibid., p. 6.

179 Ibid., p. 6 and 15In addition, the new strategy indicates military force will be used only after political, economic, and diplomatic efforts have failed; and once applied, it will be used "swiftly and decisively." Ibid., p. 15.

180 Ibid., pp. 6 -7.

181 Ibid., p. 11.

182 Ibid., p. 17 and intro. See also Bush, National Security Strategy, p. 36.

183 Powell, National Military Strategy, p. 17.

184 Ibid., To see the decrease in projected forces for Fiscal Year 1991 (FY91) versus FY95, the Air Force, for example, is projected to go from thirty-four fighter wings (twenty-two active and twelve reserve) to twenty-six wings (fifteen active and eleven reserve. Ibid., p. 19.

185 Ibid., See also Bush, National Security Strategy, p. 31The force packages are Strategic Forces, Atlantic Forces, Pacific Forces, and Contingency Forces. The support capabilities are Space, Transportation, Reconstitution, and Research and Development.

186 See Powell, National Military Strategy, pp. 20 - 21.

187 Ibid., p. 22.

188 Ibid., p. 23.

189 Ibid., p. 20GPALS is the redirected Strategic Defense Initiative (SDI) system envisioned to provide protection against a limited ballistic missile strike directed against the United States,

our forward deployed troops, our allies, and should provide incentives against their further proliferation. See Bush, National Security Strategy, pp. 25-27 for a concise statement of the U.S. nuclear deterrence and defense foundation.

190 Powell, National Military Strategy. p. 23.

191 Ibid.

192 Ibid., p. 21.

193 See Bingham, Air Power in Desert Storm, pp. 41 – 44, for a concise discussion on the shortcomings of joint aerospace doctrine.

194 Joint Pub 3-0, p. 111-12.

195 See Joint Pub 26, Joint Doctrine for Theater Counterair Operations (Washington D.C.: U.S. Government Printing Office, April 1986), p. 111-4.

196 Ibid.

197 See Lieutenant Colonels Richard Murrow (USAF) and Robert Bray (USA), Air War College Paper, Marine TACAIR and the 1986 Omnibus Agreement (Maxwell AFB, AL: April 1990)Here the authors present the Air Force and Marine views on how much authority each service feels the JFACC really has.

198 See Colonel John Boyd's "Destruction and Creation," Briefing Packet, 3 September 1976, p. 8Colonel Boyd was going through the process of defining his observe-orient-decide-act (OODA) loop. He used Heisinberg's Uncertainty Principle, entropy, and the Second Law of Thermodynamics to prove the need for an all encompassing theory of war. His bottom line is that any "inward-oriented and continued effort to improve the match-up of concept with observed reality will only decrease the degree of mismatch." Ibid., p. 10He feels this process can only "be offset by going outside and creating a new system." Ibid., p. 11.

199 The idea for these three criterion being required for an adequate expansion of joint aerospace doctrine, came from a discussion with Dr. Harold R. Winton, professor of Airpower History at the School of Advanced Airpower Studies, Maxwell AFB, AL.

200 See Drew, View Looks Different From 10,000 Feet, p. 12.

201 See AFM 1-1, Vol 2, p. 113.

202 See Greer, Air Arm Doctrinal Roots, pp. 205-207.

203 See Harris, Bomber Offensive, pp. 191-212 and Craven and Cate, Army Air Forces, Vol 2, pp. 370-376In spite of the Combined Bomber Offensive directive issued at Casablanca, the RAF and the U.S. conducted two different bombing efforts rather than one integrated around-the-clock campaign.

204 See Robert Futrell, The United States Air Force in Korea, 1950-1953 (Washington D.C.: Office of Air Force History, 1983), pp. 48-55, and General William Momyer, Airpower in Three Wars (Washington D.C.: U.S. Government Printing Office, 1978) pp. 53-62At first, there was not even a joint target selection process. In response to air component commander General George Stratemeyer's Far East Air Force (FEAF), request for operational control, a very confusing reply from the Commander-in-Chief, Far East, was received. The message from General MacArthur granted the FEAF commander operational command for all aircraft executing the FEAF mission and the commander of Naval Forces, Far East (NAVFE) operational command of all aircraft executing the NAVFE mission. Since there was no naval campaign, naval air was committed to the FEAF area. However, the directive granted the FEAF only "coordination control" of NAVFE assets; a term not defined previously. FEAF took this new term to be synonymous with operational control while NAVFE understood it to mean they were merely a "supporting force". The Navy felt they only needed the targets provided by MacArthur's Headquarters and a time to strike them. Ibid., p. 58. See also James Fiels, History of United states Naval Operations: Korea (Washington D.C.: U.S. Government Printing Office, 1962, p. 111, for a discussion on the "triple conflict" between legislation [DoD 5100.1], doctrine. and exigencies of the situation resulting in difficulties in coordinating Air Force, Naval and Marine airpower in Korea.

205 Futrell, United States Air Force in Korea. pp. 65 - 108.

206 AFM 1-1, Vol 1, p. 11Even Army commanders are willing to acknowledge how aerospace power can produce a decisive result. General Saint, CINCUSAREUR, stated in an otherwise low-keyed appraisal of "airpower" in Desert Storm, that aerospace power did independently achieve one of the stated military goals--destruction of Iraq's nuclear and chemical production facilities. See Message from CINCUSAREUR, Thoughts, p. 2, paragraph 4 D.

207 See Drew, After Desert Storm, p. 29.

208 See Admiral James D. Watkins, "The Maritime Strategy," U.S. Naval Institute Proceedings (January 1986), supplement and Admiral Frank Kelso, "The Way Ahead," U. S. Nava1 Institute Proceedings (April 1991), pp. 36-47Another key document is the Annual Report of the Secretary of the Navy. See Dick Cheney, Report of the Secretary of Defense to the President and the Congress, February 1992 (Washington D.C.: U.S. Government Printing Office, 1992), pp. 120 - 123.

209 At the Battle of Copenhagen, the Fleet Admiral decided to recall Nelson from the attack. In a now famous act, Nelson when apprised of the recall signal, raised his telescope to his blind eye and replied he could not see the signal flags. What generally is not known, is that the Admiral expected Nelson to continue the battle if "he (Nelson) is in a condition to successfully conduct the action." See David Howorth, Lord Nelson (New York: Viking Penguin. 1989), pp. 253 - 254.

210 See Kelso, The Way Ahead, p. 41

211 Ibid., p. 36

212 Ibid., p. 38.

213 Ibid., pp. 46 - 47.

214 See Captain Steven Ramsdell, "Trip Report." letter addressed to the Director, Naval Historical Center, 14 May 1991.

215 Ibid., p. 3, paragraph 3. c. (2)

216 Ibid., p. 3, paragraph 3. c. (3)After the first three days of pre-planned air strikes, multiple carrier attacks were not attempted because they were too hard to organize. Ninth Air Force uses a computer aided flight management system (CAFMS) which is the electric air tasking order (ATO) system General Horner used as the JFACC. Since no Naval carriers had this equipment, hand delivered, hard copies were required. See New, JFACC Memorandum, p. 3, and Captain Lyle Bien (USN), "From the Strike Cell." U.S. Naval Institute Proceedings (June 1991), p. 59.

217 Ramsdell, Trip Report, p. 4, paragraph 3. c. (5)This approach is exactly the two-dimensional model Colonel Drew described as being in need of replacement. See Drew, After Desert Shield, 2 March 1992, p. 29Instead. Co1 Drew calls for a new three-dimensional paradigm where aerospace power attacks strategic, operational, and tactical targets simultaneously.

218 See Momyer, Airpower in Three Wars, p. 58 and 126, for descriptions of Korea and Vietnam.

219 Definition of JFACC, see JCS 3-01.2, p. 111-4.

220 Ramsdell, Trip Report, p. 5, paragraph 3. c. (7).

221 See Headquarters, United States Marine Corps, Department of the Navy, Fleet Marine Forces Reference Publication (FMFRP) 2-5A, Marine Air-Ground Task Force Pocket Guide (Quantico, VA: Marine Corps Development Command, 16 August 1989), p. 6.

222 See Futrell, USAF in Korea, pp. 704-708 for a concise summary.

223 See Headquarters, United States Marine Corps, Department of the Navy, Fleet Marine Forces Manual (FMFM) 1, Campaigning (Washington D.C.: U.S. Government Printing Press, 25 January 1990), p. 27This doctrinal manual does mention the impact of "airpower" in strategic actions, but uses the 1986 Libyan raid as an example. It does not mention any kind of long-term aerospace use nor provide guidance on how Marine air would fit into such a plan. Ibid.

224 This differs from Army fire support doctrine is that where Marines see aviation assets as a substitute for a lack of artillery, the Army views "air fires" as an adjunct to indirect fire support. See Headquarters, Department of the Army, Field Manual 6-20, Fire Support in Combined Arms Operation (Washington D.C.: U.S. Government Printing Office, 28 January 1983), p. 1-3This manual was designed for use by all services as members of the combined arms team. Ibid., p. i. The ideas presented are supposed to serve as the foundation for JCS Pub 3-09, Doctrine for Joint Fire Support for which the Army is the lead agency. See Glen Rather,

"Joint Targeting: Lets Get it Together," Air Land Bulletin No. 91-4 (Langley, VA: AirLand Forces Application, 31 December 1991), pp. 3-6.

225 See JCS Pub 3-01.2, p. 111-4A thorough study of this statement is contained in Bray, 1986 Omnibus Agreement, passim. Another concise description is in Valliere, Stop Quibbling, pp. 38-39This agreement has spawned a heated discussion between the Air Force and the Marine Corps on just what exactly the statement means. Each side presented their viewpoint in the "war of the letters" contained in Bray, 1986 Omnibus Agreement., attachments 1, 2, and 3.

226 New, Memorandum, p. 4.

227 See the U.S. Naval Institute Proceedings, "Marine Air: There When Needed--An Interview With Lt. Gen. Royal N. Moore, Jr.," U.S. Naval Institute Proceedings: (November 1991), pp. 63-70.

228 Ibid., p. 64.

229 Ibid.

230 See Department of the Army, Headquarters U.S. Army Training and Doctrine Command, TRADOC Pamphlet 525-5, AirLand Operations, 1 August 1991, p. 1This is a pamphlet used to disseminate concepts on how future operations will be conducted. It describes how Army forces will operate in the future as a land component of an air, land, and sea joint team. It was co-signed by the Commander of Tactical Air Command. See also Colonel James McDonough "Building the New FM 100-5: Process and Product." Mi1itary Review (October 1991), pp. 2-12. Here Col McDonough states that although TRADOC 525-5 is not doctrine, it is an operational concept that flows from strategy and will lead to a new FM 100-5 and doctrine. Ibid., p. 5.

231 Ibid., see Figure 2, p. 11.

232 Ibid.

233 Ibid., p. 11 for the air focus and p. 12 for the land focus. The Joint Battle Area is further divided into a shaping area and the close battle area. It is in the close battle area that "decisive operations" occurs. Ibid., p. 15The deepest zone in the enemy area is called the "Joint Intelligence and Air Attack Area." According to TRADOC 525-5 the aerospace mission" priorities include intelligence, interdiction, and offensive counterair operations.

234 See FM 100-5, p. 4.

235 See George C. Kenney, General Kenney Reports: A Personal History of the Pacific War (Washington D.C.: Office of Air Force History, 1987), pp. 91 and 111Here General Kenney describes how General Douglas MacArthur, theater commander in the Southwest Pacific, employed land forces to seize airfields which would then, in turn support the next land campaign to seize another airfield. See also Chaim Herzog, The Arab-Israeli Wars: War and Peace in the Middle East (New York: Vintage Books, 1984), p. 262Here Mr. Herzog describes how Israeli tanks destroyed the surface-to-air threats in the 1973 Yom Kippur War

so that the airpower could then provide close battlefield support Israeli doctrine called for. In Desert Storm, Army helicopters destroyed the first Early Warning radars on January 16. 1991, opening a hole for air forces to begin the strategic attacks on Iraq. see Cheney, Conflict in the Persian Gulf, p. 4-3.

236 AFM 1-1, Vol 1, p. 5.

237 See AFM 1-1, Vol 1, p. 9Here it states that an airman, not specifically an Air Force officer, "should be responsible for employing all air and space assets in theater."

238 AFM 1-1, Vol 1, p. 5.

239 AFM 1-1, Vol 2, essay I, p. 72.

240 This concept of two and three dimensional models was developed by Colonel Drew in an Air Force Times article. See Drew, After Desert Storm, p. 29.

241 Boyd, Destruction and Creation, p. 11.

242 Make no mistake, AFM 1-1 is an Air Force Manual and clearly a service doctrine. It is not Joint doctrine, but will serve as input into the Joint Manuals currently in draft form. The Air Force is the lead agent for developing the following major JCS Pubs: 3-01.2, "Joint Doctrine for Theater Counterair Operations"; 3-03, "Joint Doctrine for Interdiction Operations"; 3-14. "Doc- trine for Joint Space Operations"; and 3-52"Doctrine for Joint Airspace Control." The J-7 staff is responsible for JCS Pub 5-0, "Doctrine for the Planning of Joint Operations." All developers plan on using the new AFM 1-1 as the baseline for aerospace operations. See Headquarters Department of the Air Force, AFR 1-2, Assignment of Responsibilities for Development of Aerospace Doctrine (Washington D.C.: U.S. Government Printing Office. 10 Sep 90), pp. 9-10. Also per telecom with Lt. Col. Michael Luers and Lt. Col. Terry New, Headquarters, Air Staff (XOXWD), 27 Jan 92.

243 As quoted in Lieutenant Colonel Charles Westenhoff, Military Air Power: The CADRE Digest of Air Power Opinions and Thoughts (Maxwell AFB, AL: Air University Press, October 1990), p. 48.

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