

Air Force Manual 1-1
Volume I

**Basic Aerospace Doctrine
of the
United States Air Force**



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Foreword

This manual is one of the most important documents ever published by the United States Air Force. Doctrine is important because it provides the framework for understanding how to apply military power. It is what history has taught us works in war, as well as what does not.

This edition has special significance because it contains not only the "bare bones" of our doctrine in quick-reference form (volume I) but also the essays that provide the evidence and supporting rationale for each doctrinal statement (volume II).

The guidance this manual provides will be valuable to those in field units and to those in headquarters, to those in operations and to those in support areas, to those who understand air and space power and to those who are just learning. In short, this manual will be valuable to the entire force.

I expect every airman and, in particular, every noncommissioned and commissioned officer to read, study, and understand volume I and to become fully conversant with volume II. The contents of these two volumes are at the heart of the profession of arms for airmen.



MERRILL A. McPEAK
General, USAF
Chief of Staff

Introduction

Aerospace doctrine is, simply defined, what we hold true about aerospace power and the best way to do the job in the Air Force. It is based on experience, our own and that of others. Doctrine is what we have learned about aerospace power and its application since the dawn of powered flight. While history does not provide specific formulas that can be applied without modification to present and future situations, it does provide the broad conceptual basis for our understanding of war, human nature, and aerospace power. Thus, doctrine is a guide for the exercise of professional judgment rather than a set of rules to be followed blindly. It is the starting point for solving contemporary problems.

Doctrine is also a standard against which to measure our efforts. It describes our understanding of the best way to do the job—the world as it should be. Many factors can prevent us from acting in the best manner, but doctrine can guide our efforts, gauge our success, and illuminate our problems.

Doctrine should be alive—growing, evolving, and maturing. New experiences, reinterpretations of former experiences, advances in technology, changes in threats, and cultural changes can all require alterations to parts of our doctrine even as other parts remain constant. If we allow our thinking about aerospace power to stagnate, our doctrine can become dogma.

This is an airman's doctrine—written by air power scholars for use by air power practitioners.

Chapter 1

War and the American Military

It is clear that war should never be thought of as something autonomous but always as an instrument of policy.

Carl von Clausewitz

An understanding of aerospace doctrine must begin with an understanding of the nature of war. The American penchant for viewing war as an aberration in the affairs of man, and as an occasional crusade to destroy a clearly recognized evil, often distorts our understanding of warfare and its purposes.

1-1. War is a violent struggle between rival societies to attain competing political objectives. War is just one means used by nation-states, sub-national groups, or supranational groups to achieve disputed objectives. (Refer to vol. II, essay A.)

a. **War is an instrument of political policy.** War is generally the instrument of last resort reserved for those issues deemed vital (disputes that cannot be resolved using nonviolent instruments of policy). War does not replace other instruments of policy, rather it is used in addition to other instruments. (Refer to vol. II, essay A.)

b. **The military objective in war is to compel the adversary to do our will.** Lasting success (a better state of peace) requires that the adversary's hostile will and ability be overcome. Overcoming hostile will can involve military operations but primarily relies on other instruments of policy. The military is the instrument of power (policy) best suited to attack the ability to resist. Military methods are based upon the principles of war (fig. 1-1) but must be coordinated and orchestrated with nonmilitary instruments of national power. (Refer to vol. II, essay A.)

1-2. War is a human enterprise. The use of violence injects levels of emotion and ferocity into war that tend to undermine the rationality and cloud the vision of friend and foe. (Refer to vol. II, essay C.)

PRINCIPLES OF WAR

(Refer to vol. II, essay B.)

Objective. Direct military operations toward a defined and attainable objective that contributes to strategic, operational, or tactical aims.

Offensive. Act rather than react and dictate the time, place, purpose, scope, intensity, and pace of operations. The initiative must be seized, retained, and fully exploited.

Mass. Concentrate combat power at the decisive time and place.

Economy of Force. Create usable mass by using minimum combat power on secondary objectives. Make the fullest use of all forces available.

Maneuver. Place the enemy in a position of disadvantage through the flexible application of combat power.

Unity of Command. Ensure unity of effort for every objective under one responsible commander.

Security. Protect friendly forces and their operations from enemy actions which could provide the enemy with unexpected advantage.

Surprise. Strike the enemy at a time or place or in a manner for which he is unprepared.

Simplicity. Avoid unnecessary complexity in preparing, planning, and conducting military operations.

Figure 1-1.

a. **War is characterized by "fog, friction, and chance."** War is not an engineering project and must not be treated as such. All human qualities—good and bad, often influenced by fear and fatigue—ensure that war will be characterized by uncertainty, unreliability, and unpredictability. (Refer to vol. II, essay C.)

b. **Success in war requires mastery of the art of war as well as the science of war.** Modern warfare is one of the most complex of human activities. Success in war depends at least as much on intellectual superiority as it does on numerical and technological superiority. Victory results from creating advantages against a thinking opponent who is bent on creating his own advantages. Thus, success demands an intricate combination of the science of war (that which can be measured and studied) and the art of war (the creative, flexible, and responsive employment of means to achieve tasks). (Refer to vol. II, essay D.)

c. **The principles of war help provide a better understanding of warfare, but they are not checklist items that necessarily lead to success.** The principles are important to the understanding and mastery of warfare, but professional expertise requires a depth of knowledge far beyond mere principles. (Refer to vol. II, essay B.)

1-3. The study of war is complicated because war is complicated. Attempts to simplify war by arranging descriptions along a "spectrum" or a "continuum" can lead to oversimplification. The following discussion recognizes that war can be characterized in many ways. The warrior must strive to understand all of them. (Refer to vol. II, essay E.)

a. **War can be characterized by the level of objective intent.** Total destruction of an enemy is at the high end of objective intent. An example of lower levels of objective intent would be to apply military leverage to change an enemy's behavior or to punish an enemy for transgressions. (Refer to vol II, essay E.)

b. **War can be characterized by the level of effort supporting the war.** National mobilization describes the maximum level of effort of nations at war. On the other hand, throughout history nations have gone to war using limited resources to achieve limited objectives. (Refer to vol. II, essay E)

c. **War can be described at any instant by the level of intensity of combat.** Rapid and continuous engagement and exchange of lethal blows between nuclear or conventional forces characterize the high end of combat intensity. The use of subversion, terrorism, and guerrilla tactics often found in insurgent

warfare characterize the lower levels of combat intensity. (Refer to vol. II, essays E and R.)

d. **War can be characterized by the nature of alliance or coalition relationships.** Coalitions may be binational, multinational, or, in the case of insurgency, subnational. Coalition relationships can increase strengths, cause vulnerabilities, determine command relationships, and influence employment strategies. (Refer to vol. II, essay E.)

e. **War can be characterized by the weaponry employed.** In this regard, nuclear and conventional warfare involve such fundamental differences that the differences have a significant effect on required equipment, training, and employment techniques. Nuclear warfare is unique in that no instance of it has occurred when more than one opponent had nuclear weapons. Because of the uncertainties associated with nuclear warfare and the destructive power of nuclear weapons, deterrence has been and will continue to be a cornerstone of American security policy. (Refer to vol. II, essays E and R.)

f. **The forms and characteristics of war are not mutually exclusive.** Depending on circumstances (including political and operational objectives, as well as the military capabilities of opposing forces), a particular form of war may assume more than one dimension over time, or different forms of warfare may occur simultaneously. For example, an insurgency may take on conventional overtones with the overt military intervention of a third country, or a conventional war against a nuclear-equipped adversary may, at some point, involve the use of nuclear weapons. Further, a variety of weapons, including chemical and biological, can be employed in any form of war. (Refer to vol. II, essays E and R.)

1-4. War is planned and executed at three levels: strategic, operational, and tactical. These levels are dynamically interrelated. There are no clearly defined boundaries between them. (Refer to vol. II, essay F.)

a. **The strategic level of war incorporates the broadest concerns of national policy.** The entire war effort, not just the military effort, is the focus. Decisions at this level should reflect national goals, integrate all of the instruments of power, provide forces, and determine constraints on their use. (Refer to vol. II, essay F.)

b. **The operational level of war focuses on campaigns.** Decisions at this level orchestrate forces to accomplish strategic objectives within a theater. These objectives are achieved through the design, or-

ganization, and conduct of campaigns and major operations that guide tactical events. (Refer to vol. II, essay F.)

c. **The tactical level of war focuses on battles and engagements.** Decisions at this level apply combat power to create advantages when in contact with or proximity to the enemy. (Refer to vol. II, essay F.)

1-5. A significant domain of military activities exists below the level of war. The United States seeks to preserve a stable global environment in which its national interests can be achieved through peaceful access to free markets and resources. In this regard, US military forces are charged with a range of peacetime responsibilities in addition to preparing for war. The dividing line between military operations in war and those short of war is not always clear-cut. (Refer to vol. II, essay G.)

a. **American military forces are called upon to train and advise other nations in matters of defense, to include foreign internal defense.** Training and advisory efforts promote regional stability by facilitating collective security, self-defense capabilities, and internal order among foreign friends and allies. (Refer to vol. II, essay G.)

b. **Peacekeeping functions, support for insurgencies and counterinsurgencies, and combating terrorism often involve activities short of war.** American military forces may be called on to perform specific peacekeeping functions in resolving regional conflicts. Additionally, the United States has found it necessary to lend support to governments combating insurgencies and to support insurgent movements. Finally, combating terrorist threats may involve the US military in activities short of warfare. (Refer to vol. II, essay G.)

c. **Activities short of war have important ancillary benefits.** Peacetime activities result in direct contacts between US military forces and the forces of many other nations. These contacts often prove helpful in pursuing such national goals as democratization and peaceful conflict resolution. (Refer to vol. II, essay G.)

1-6. The organization of the American military is based on the concept of task specialization. The organizational framework and responsibilities are prescribed by public law. (Refer to vol. II, appendices 1 and 2.)

a. **The services organize, train, equip, and provide military forces.** The services are organized under three departments, generally along the lines of

mediums of warfare: air, land, and sea. (Refer to vol. II, appendix 1.)

(1) Each department is charged with the development and cultivation of specialized competence in one of the mediums of warfare. (Refer to vol. II, appendix 1.)

(2) The military departments are also charged with the responsibility for defining the future requirements of war fighting and deterrence with respect to the associated mediums of warfare. When requirements are approved by appropriate authorities, military departments are responsible for acquiring, testing, and fielding war-fighting systems. (Refer to vol. II, appendix 1.)

b. **Forces are provided by the services to commanders of combatant commands through service component commanders.** Service component commanders remain responsible for continued training, administration, and logistic support of assigned forces. (Refer to vol. II, appendices 1 and 2.)

(1) Commanders of combatant commands are charged with broad mission responsibilities and are empowered with operational authority to employ forces provided by the military departments. (Refer to vol. II, appendix 2.)

(2) A commander of a combatant command envisions means of accomplishing his missions (joint commander's intent) and develops plans to carry out these missions—campaign plans. (Refer to vol. II, appendix 2.)

(3) Ideally, campaign planning responsibilities are fully shared with subordinate component commanders to ensure that the best available specialized expertise and forces are brought to bear most efficiently and effectively on the combatant commander's mission. (Refer to vol. II, appendix 2.)

c. **Component commanders provide specialized competence.** Commanders of component commands bring land, sea, air, or other specialized competence and forces for employment under the operational authority of commanders of combatant commands. (Refer to vol. II, appendix 2.)

(1) In concert with the joint commander, each component commander develops his vision (component commander's intent) of the best ways in which his particular expertise and forces can be brought to bear on the combatant commander's mission. (Refer to vol. II, appendix 2.)

(2) Component commanders incorporate their visions while translating the joint commander's intent into operational plans that support the combatant commander's plan. (Refer to vol. II, appendix 2.)

Chapter 2

The Nature of Aerospace Power

Nowadays, anyone considering land and sea operations of any importance must of necessity remember that above the land and sea is the air.

Giulio Douhet

The advent of air power, and later aerospace power, did not change the essential nature of war, but air power did change the way war is conducted. Further, it created the requirement for development and cultivation of a new expertise, a competence in exploiting the three-dimensional aspects of aerospace forces.

Section A

Aerospace Environment

2-1. The aerospace environment can be most fully exploited when considered as an indivisible whole. Although there are physical differences between the atmosphere and space, there is no absolute boundary between them. The same basic military activities can be performed in each, albeit with different platforms and methods. (Refer to vol. II, essays H and I.)

a. **Aerospace consists of the entire expanse above the earth's surface.** Its lower limit is the earth's surface (land or water), and its upper limit reaches toward infinity. (Refer to vol. II, essay H.)

b. **Aerospace provides access to all of the earth's surface.** Unlike surface environments, aerospace has no natural lateral boundaries. Nations do recognize political boundaries in the atmosphere, but by convention there are no such boundaries in space. (Refer to vol. II, essay H.)

Section B

Aerospace Power

2-2. Aerospace power grows out of the ability to use a platform operating in or passing through the aerospace medium for military purposes. Development of platforms that operate above both land and sea has significantly altered warfare by

creating a third dimension for military operations. (Refer to vol. II, essay I.)

a. **Elevation above the earth's surface provides relative advantages over surface-bound forces.** Elevation provides broader perspective, greater potential speed and range, and three-dimensional movement. The result is inherent flexibility and versatility based on greater mobility and responsiveness. Aerospace power's speed, range, flexibility, and versatility are its outstanding attributes. This combination of attributes provides the foundation for the employment concepts of aerospace power. (Refer to vol. II, essay J.)

(1) **Aerospace power can quickly concentrate on or above any point on the earth's surface.** Aerospace power can exploit the principles of mass and maneuver simultaneously to a far greater extent than surface forces. There are no natural lateral boundaries in the aerospace environment to prevent aerospace platforms from concentrating their power at any point, and from doing so very quickly, even when starting from widely dispersed locations. (Refer to vol. II, essay J.)

(2) **Aerospace power can apply force against any facet of enemy power.** Aerospace power can be brought to bear on an enemy's political, military, economic, and social structures simultaneously or separately. It can be employed in support of national, theater/joint, or other component objectives. It can be coordinated with surface power or employed independently. (Refer to vol. II, essay J.)

b. **The inherent speed, range, and flexibility of aerospace power combine to make it the most versatile component of military power.** Its versatility allows aerospace power to be rapidly employed against any level of objective from strategic through theater, to include tactical employment in support of

other component forces' objectives. The versatility of aerospace power may easily be lost if aerospace forces are subordinated to surface elements of power. (Refer to vol. II, essay J.)

2-3. Aerospace power results from the effective integration of platforms, people, weapons, bases, logistics, and all supporting infrastructure. No one aspect of aerospace power should be treated in isolation since each element is essential and interdependent. (Refer to vol. II, essay K.)

a. **Ultimately, aerospace power depends on the performance of the people who operate, command, and sustain aerospace platforms.** Although human performance can rise far above expectations under the stress of combat, commanders must remember that everyone has a breaking point. When that point is reached, individual performance tends to degrade catastrophically rather than gradually. (Refer to vol. II, essay K.)

b. **The choice of weapons is a key aspect in the realization of aerospace power.** Weapons should be selected based on their ability to influence an adversary's capability and will. (Refer to vol. II, essay K.)

c. **Precision weaponry requires precise intelligence and effective command and control.** Achieving the full potential of aerospace power requires timely, relevant intelligence and sufficient command and control assets to permit commanders to exploit its speed, range, flexibility, and versatility. (Refer to vol. II, essay K.)

d. **Supporting bases with their people, systems, and facilities are essential to launch, recovery, and sustainment of aerospace platforms.** The effectiveness of aerospace forces depends on base availability and operability. (Refer to vol. II, essay K.)

Section C

Aerospace Roles and Missions

2-4. Aerospace forces perform four basic roles: aerospace control, force application, force enhancement, and force support (fig. 2-1). Roles define the broad purposes or functions of aerospace forces. Missions define specific tasks, not capabilities or organizations. The roles and missions are, in turn, defined by objectives, not by the platform or weapon used. Most aerospace forces can perform multiple roles and missions, and some can perform multiple roles and missions in unique ways. Role and mission matchups are not exclusive. For example, the electronic combat mission, while primarily a force en-

hancer, can be a vital element in both the aerospace control and force application roles. Special operations forces also provide capabilities for many roles and missions. They are used to perform close air support, interdiction, airlift, reconnaissance, and other missions from pre-conflict stages through the full spectrum of conflict, but generally they operate within the framework of clandestine conditions. Because of the unique demands of these applications, employment of special operations forces involves *highly* specialized training and *ideally* utilizes specialized aerospace platforms. These capabilities are most often employed as part of a joint special operations task force (JSOTF). Effective force application and safety requirements make it essential that the JSOTF commander operates in close coordination with the theater air commander. (Refer to vol. II, essay L.)

a. **Aerospace control assures the friendly use of the environment while denying its use to an enemy.** Aerospace control includes all missions whose objectives are designed to gain and maintain control of the aerospace environment. Counterair missions are those whose objective is control of the air. The objective of counterspace missions is control of space. These missions can be further divided into offensive and defensive aerospace control. Offensive aerospace control operations seek out and neutralize or destroy enemy aerospace forces and ground-based defenses at a time and place of our choosing. Defensive aerospace control operations detect, identify, intercept, and destroy enemy aerospace forces attempting to attack friendly forces or to penetrate the aerospace environment above friendly surface forces. (Refer to vol. II, essay L.)

b. **Force application brings aerospace power to bear directly against surface targets.** This role includes those missions that apply combat power against surface targets exclusive of missions whose objective is aerospace control. The objective of the strategic attack mission is to destroy or neutralize an enemy's war-sustaining capabilities or will to fight. Interdiction delays, disrupts, diverts, or destroys an enemy's military potential before it can be brought to bear against friendly forces. Close air support directly supports the surface commander by destroying or neutralizing enemy forces that are in proximity to friendly forces. (Refer to vol. II, essay L.)

c. **Force enhancement increases the ability of aerospace and surface forces to perform their missions.** Airlift projects power by transporting people and materiel rapidly without regard to surface

obstacles. Air refueling increases the ability of aircraft by extending their range, payload, and endurance. Spacelift projects power by transporting people and materiel to and through space. Electronic combat controls the electromagnetic spectrum by neutralizing or destroying the enemy's electromagnetic capabilities. Surveillance and reconnaissance provide data needed for effective combat operations. (Refer to vol. II, essay L.)

d. **Force support must sustain operations if aerospace forces are to be successful.** Forces performing the base operability and defense mission defend aerospace installations from attack, help aerospace forces survive such attacks, and return in-

stallations to full capability after attacks. Logistics creates and sustains aerospace forces. This mission involves all such activities except those that are part of the combat support mission. Combat support provides essential services to aerospace organizations and their personnel in operational conditions. On-orbit support keeps platforms in space operating as effectively and efficiently as possible. (Refer to vol. II, essay L.)

Section D

Tenets of Aerospace Power

2-5. Aerospace power employment is based on the principles of war and the tenets of aerospace

ROLES AND TYPICAL MISSIONS OF AEROSPACE POWER (See notes below and refer to vol. II, essay L.)	
ROLES	TYPICAL MISSIONS
AEROSPACE CONTROL (Control the Combat Environment)	Counterair Counterspace
FORCE APPLICATION (Apply Combat Power)	Strategic Attack Interdiction Close Air Support
FORCE ENHANCEMENT (Multiply Combat Effectiveness)	Airlift Air Refueling Spacelift Electronic Combat Surveillance and Reconnaissance Special Operations
FORCE SUPPORT (Sustain Forces)	Base Operability and Defense Logistics Combat Support On-Orbit Support

NOTES:

1. Role and mission matchups are not exclusive. A strategic attack (e.g., bombing an aircraft factory) can be a vital part of the aerospace control role.
2. The development of capabilities in space depends on technological advancements and national policy.
3. Aerospace forces and platforms are not limited to particular roles or missions. For example, heavy bombers can perform close air support, fighter-bombers can attack strategic targets, and special operations forces can perform a variety of roles and missions.

Figure 2-1.

power. The principles of war were presented in chapter 1 (fig. 1-1). The tenets of aerospace power (fig. 2-2) are important guidelines and considerations for commanders in addition to the principles of war. These tenets describe how aerospace power can be used to achieve military objectives. They highlight important ways aerospace forces differ from surface

forces. While the principles of war are guidelines that commanders of all types of forces can use to form and select a course of action, the tenets of aerospace power reflect more specific understanding of the aerospace medium and current aerospace capabilities.

(Refer to vol. II, essay M.)

TENETS OF AEROSPACE POWER

(Refer to vol. II, essay M.)

Centralized Control/Decentralized Execution

Aerospace forces should be centrally controlled by an airman to achieve advantageous synergies, establish effective priorities, capitalize on unique strategic and operational flexibilities, ensure unity of purpose, and minimize the potential for conflicting objectives. Execution of aerospace missions should be decentralized to achieve effective spans of control, responsiveness, and tactical flexibility.

Flexibility/Versatility

The unique flexibility and versatility of aerospace power should be fully used and not compromised. The ability to concentrate force anywhere and attack any facet of the enemy's power is the outstanding strength of aerospace power.

Priority

Effective priorities for the use of aerospace forces flow from an informed dialogue between the joint or combined commander and the air component commander. The air commander should assess the possible uses as to their importance to (1) the war, (2) the campaign, and (3) the battle. Air commanders should be alert for the potential diversion of aerospace forces to missions of marginal importance.

Synergy

Internally, the missions of aerospace power, when applied in comprehensive and mutually supportive air campaigns, produce effects well beyond the proportion of each mission's individual contribution to the campaign. Externally, aerospace operations can be applied in coordinated joint campaigns with surface forces, either to enhance or be enhanced by surface forces.

Balance

The air commander should balance combat opportunity, necessity, effectiveness, and efficiency against the associated risk to friendly aerospace resources. Technologically sophisticated aerospace assets are not available in vast numbers and cannot be produced quickly.

Concentration

Aerospace power is most effective when it is focused in purpose and not needlessly dispersed.

Persistence

Aerospace power should be applied persistently. Destroyed targets may be rebuilt by resourceful enemies. Air commanders should plan for restrikes against important targets.

Figure 2-2.

Chapter 3

Employing Aerospace Forces The Operational Art

If we lose the war in the air, we lose the war and lose it quickly.

Field Marshal Montgomery

This chapter deals with employment of aerospace forces at the operational level of war. It builds upon the guidance presented in chapters 1 and 2. Each statement within this chapter must be considered within the context of the previous chapters. Of particular importance is the principle of the objective and the required linkage between strategic objectives, operational (campaign) objectives, and tactical objectives. The objective is the driving force behind decisions at each level of warfare. Air power's versatility derives from its ability to attack targets affecting each level of warfare at any time. In this regard, air power employment may precede other campaign efforts, or surface forces may support air forces in a joint campaign. While powerful synergies can be created when aerospace, land, and naval forces are employed in a single, integrated campaign, it is possible that aerospace forces can make the most effective contribution when they are employed in parallel or relatively independent aerospace campaigns. The primary criterion for such choices should be the suitability of the aerospace campaign to fulfill the intent of the operational commander.

Section A

Influences on Campaign Employment

3-1. Airmen are responsible for the effective employment of aerospace power. Airmen's specialized competence in the military exploitation of the aerospace medium is the basis for their responsibility. Their responsibility begins with the advice they pro-

vide on what aerospace forces are needed and how these forces can contribute to national objectives. It continues with the employment of aerospace forces in a specific theater. An airman, acting as an air component commander, should be responsible for employing all air and space assets in the theater. Based on his knowledge and experience, the air component commander should also propose courses of action to the joint or combined commander, as well as to the land and naval component commanders, to ensure that contingency operations and theater campaigns derive the maximum benefit from available aerospace assets. (Refer to vol. II, essay N.)

3-2. There is no universal formula for the proper employment of aerospace power in a campaign. The campaign objective, together with its relationships to strategic and tactical objectives, is the paramount consideration in every campaign. In addition to the controlling influence of the objective, optimum use of aerospace forces depends upon a host of dynamic circumstances peculiar to the conflict at hand. Orchestration of aerospace missions into an effective campaign in the face of peculiar and often rapidly changing situations comprises the airman's operational art. Several (but not all) of the most important influences are outlined below. (Refer to vol. II, essay N.)

a. The nature of the enemy should be a primary consideration in campaign decisions. The nature of the enemy defines the enemy's centers of gravity, how the enemy will fight, and thus the threat the enemy poses to the achievement of friendly objectives. These factors affect the focus of a campaign and determine aerospace mission priorities. Under-

standing the enemy requires effective intelligence organizations, capabilities, and procedures. (Refer to vol. II, essay N.)

b. **The characteristics of a war should shape campaign decisions.** The specific characteristics of a war determine what missions should comprise the campaign, how they must be executed, and how much freedom of action is available for military operations. (Refer to vol. II, essays E and N.)

c. **The nature and location of the theater greatly influence campaign decisions.** Deployment range, theater infrastructure, and regional geography affect the role of aerospace forces, specifically mission requirements and priorities and operational tempo. (Refer to vol. II, essay N.)

d. **Planners should examine the full range of available air and space assets when selecting the systems required to achieve the objective of the campaign.** The growing capabilities of space assets complement and, in some cases, may substitute for traditional (air and surface) capabilities. The combined employment of air and space assets provides greater flexibility and redundancy in the conduct of the campaign. The enemy may have similar flexibility and redundancy, which would further influence the campaign. (Refer to vol. II, essay N.)

e. **The versatility of aerospace power should be a key consideration in the development of courses of action.** Airmen should examine how aerospace forces employed independently, attacking any facet of the enemy's power, can contribute to strategic objectives. They should also examine the contribution aerospace forces can make when their employment is coordinated with surface forces. The synergies from simultaneous execution of multiple, complementary courses of action should receive careful attention. (Refer to vol. II, essay N.)

Section B

Aerospace Operational Art

3-3. **The essence of aerospace operational art is the planning and employment of air and space assets to maximize their contribution to the combatant commander's intent.** Aerospace power may be employed independently of or in conjunction with surface operations. The air component commander's exercise of operational art involves four tasks. The first is envisioning the theater and determining when and where to apply what force in concert with the

combatant commander. The next is creating conditions that give units applying force the best chance of success. The third is directing adjustments to operations in accordance with mission results and the operational commander's revised intent. The final is exploiting the often fleeting opportunities that result from combat. In each task, the key to success lies in an air component commander's ability to achieve objectives by orchestrating aerospace roles and missions so they produce a mutually reinforcing effect. (Refer to vol. II, essay N.)

Section C

Orchestrating Aerospace Roles and Missions

ROLE	TYPICAL MISSIONS
AEROSPACE CONTROL (Control the Combat Environment)	Counterair Counterspace

3-4. **Aerospace control normally should be the first priority of aerospace forces.** Aerospace control permits aerospace and surface forces to operate more effectively and denies these advantages to the enemy. As the degree of control increases, all aerospace and surface efforts gain effectiveness. Conversely, any reduction in control threatens every mission, campaign, and type of force. Control is an enabling means rather than an end in itself. (Refer to vol. II, essay O.)

a. **The aerospace missions most directly involved in aerospace control are counterair and counterspace.** If, how, and when these broad missions, which have many offensive and defensive subsets, are used depends upon the situation at hand. Other aerospace missions (e.g., strategic attack) can contribute directly to aerospace control. Surface forces also can contribute directly. For example, ground forces can attack enemy air bases and defend friendly air bases. (Refer to vol. II, essay O.)

b. **Absolute control of the environment is the ideal aim of aerospace control operations.** Airmen must be particularly aware that aerospace control is generally a matter of degree. Absolute control of the air (air supremacy) or of space is not possible as long

as the enemy possesses any aerospace forces capable of effective interference. While establishing the desired degree of control, effective coordination, integration, regulation, and proper identification are essential if aerospace forces are to avoid fratricide. (Refer to vol. II, essay O.)

c. **Offensive counter aerospace actions are usually necessary to achieve sufficient aerospace control.** Often, the most effective and efficient method for achieving the appropriate degree of aerospace control is to attack the enemy's aerospace assets close to their source. (Refer to vol. II, essay O.)

(1) **Offensive actions should include attacks on enemy warning and control systems.** Warning and command and control systems are usually critical to the effective operation of aerospace forces. Offensive actions should deny the enemy access to surveillance, reconnaissance, and intelligence-gathering systems. Offensive actions should also prevent the enemy from launching additional systems. (Refer to vol. II, essay O.)

(2) **Offensive actions should include attacks on enemy bases and launch facilities.** Aerospace forces can be most vulnerable when grouped together on the surface and, where possible, should be destroyed or neutralized through destruction or denial of critical facilities. (Refer to vol. II, essay O.)

(3) **Offensive actions should attack enemy surface-based aerospace defenses.** Proliferation of sophisticated surface-based aerospace defenses means that, even without aircraft, the enemy may be able to deny friendly forces an acceptable degree of aerospace control. (Refer to vol. II, essay O.)

(4) **Commanders should consider the utility of surface forces in support of offensive counter aerospace actions.** Surface forces may be able to seize enemy installations or disrupt operations at enemy bases, launch facilities, and surface aerospace warning, control, and defensive facilities. (Refer to vol. II, essay O.)

d. **In most circumstances, commanders must execute the defensive counter aerospace mission.** Unless the threat from enemy aerospace forces is insignificant, defensive actions will be required. (Refer to vol. II, essay O.)

(1) **The current situation must dictate the level of emphasis on the defensive counter aerospace mission.** Early in a campaign, there may be no choice but to emphasize defensive missions. (Refer to vol. II, essay O.)

(2) **Defensive counter aerospace missions concentrate on defeating the enemy's offensive plan and on inflicting unacceptable losses on attacking enemy forces.** To achieve a powerful defensive capability, aerospace forces require effective warning; command, control, and communication systems; and careful integration of surface-based defensive capabilities. (Refer to vol. II, essay O.)

ROLE	TYPICAL MISSIONS
FORCE APPLICATION (Apply Combat Power)	Strategic Attack Interdiction Close Air Support

3-5. Aerospace forces can attack the full spectrum of enemy capabilities. With the appropriate degree of aerospace control, aerospace forces possess the versatility to deliver combat power on the enemy when and where needed to attain military objectives at any level of war. In most cases, combat power is increased by the use of precision weaponry, which allows a higher operational tempo, reduces risk, and decreases collateral damage. Force application missions can be conducted independently of, in parallel with, or in support of surface operations. There are important synergies between the missions of the force application role. (Refer to vol. II, essays P and Q.)

a. **Strategic attacks should produce effects well beyond the proportion of effort expended in their execution.** Strategic attacks are carried out against an enemy's centers of gravity including command elements, war production assets, and supporting infrastructure (for example, energy, transportation, and communication assets). Strategic attacks should be designed to be persistent and coordinated so as to affect the enemy's capability and possibly his will to wage war. Thus, strategic attacks should affect the entire war effort rather than just a single campaign or a single battle. (Refer to vol. II, essays P and R.)

(1) **Strategic attacks are defined by the objective—not by the weapon system employed, munition used, or target location.** Strategic attacks (whether conventional or nuclear) can make vital and at times decisive contributions in gaining a war's objectives. (Refer to vol. II, essays P and R.)

(2) **Strategic attacks should be executed to achieve maximum destruction of the enemy's ability to wage war.** In addition to this destruction, strategic attacks (conducted at the right time, place, and intensity) can, as a secondary effect, produce shock that demoralizes the enemy's leadership, military forces, and population, thus affecting the enemy's desire to wage war. However, a demoralizing psychological impact can be an elusive objective. (Refer to vol. II, essays P and R.)

(3) **Precision weaponry has greatly enhanced the efficiency of strategic attack.** Being able to hit a precise target in the first attempt provides tremendous leverage. It also reduces the need for large expenditures of air power and reduces the risk of collateral damage. (Refer to vol. II, essay P.)

(4) **The effects of strategic attacks may be increased when they are integrated with other aerospace force application missions and with surface operations to form a synergistic campaign.** For example, interdiction of war materials is much more effective if the factories producing those materials are destroyed or impaired through strategic attacks. Conversely, such attacks can be of little avail unless surface forces take advantage of the situation. (Refer to vol. II, essay P.)

(5) **Any enemy with the capacity to be a threat is likely to have strategic vulnerabilities susceptible to air attack; discerning those vulnerabilities is an airman's task.** Even nations that possess no significant industrial base and rely on imported weaponry may have vulnerable leadership or economic targets, ports, or sea lines of communication. In some less-developed states, transportation and communication nets may be primitive or extremely resilient, and enemy command elements may be very difficult to target. In such cases, strategic attacks may not be as effective as against industrialized nations, but nonetheless will have an impact on war-sustaining capabilities. (Refer to vol. II, essays P and R.)

b. Interdiction and surface operations should be planned and executed to complement and reinforce each other. Interdiction disrupts, delays, or destroys an enemy's military potential before it can be used against friendly forces. Aerospace forces can be very effective in attacking the movement and supply of an enemy's forces. To achieve efficiencies and enhance effectiveness, the air component commander should control all forces performing interdiction and integrate interdiction with surface force operations to achieve the theater commander's objectives. (Refer to vol. II, essay Q.)

(1) **Complementary employment of interdiction and surface maneuver should be designed to present the enemy with a dilemma.** Actual or threatened surface maneuver can force an enemy to respond by attempting rapid movement or resupply. These responses can provide excellent and vulnerable targets for interdiction efforts, creating an agonizing dilemma for the enemy. If the enemy attempts to counter the surface maneuver, his forces will be exposed to unacceptable losses from interdiction; if the enemy employs measures to reduce such losses, his forces will not be able to counter the surface maneuver. Gaining maximum advantage from the enemy's dilemma depends on the ability of friendly surface forces to exploit the enemy's delay and disruption. (Refer to vol. II, essay Q.)

(2) **The depth at which interdiction is performed generally determines the freedom of action available to the attacking force.** Increasing the depth of operations reduces the danger of fratricide for friendly air and surface forces, reduces the coordination required between components, and allows increasingly flexible operations. The attacker's increased freedom of action compounds the defender's problem by leaving no location immune to attack. (Refer to vol. II, essay Q.)

(3) **Interdiction may have tactical, operational, or strategic-level effects.** The depth at which interdiction is conducted often determines the speed with which its effects are seen. Depending on a variety of factors, such as the nature of enemy forces and communications infrastructure, interdiction deep in the enemy's rear will have a broad operational or strategic-level effect but a delayed effect on surface combat. Such operational and strategic-level effects normally will be of greatest concern from the theater perspective. In contrast, targets closer to the battle are likely to be of more immediate concern to surface maneuver units. Interdiction close to the battle area will produce more quickly discernible results, but only on forces in the vicinity of the attacks. Regardless of where interdiction is performed, air and surface commanders together should consider how surface forces can be employed to enhance the ability of air interdiction to support the campaign's objectives. (Refer to vol. II, essay Q.)

(4) **Air interdiction's ability to delay and disrupt may have a devastating impact on the enemy's plans and ability to respond to the actions of friendly forces.** Delay or disruption of enemy maneuver enhances the ability of friendly surface forces to achieve operational or tactical advantages. Delay or disruption of enemy resupply efforts, let

alone destruction of supplies and the means to move them, limits the enemy's ability to sustain intense, high-tempo offensive or defensive operations and restricts the mobility of his forces. (Refer to vol. II, essay Q.)

(5) **Interdiction can be an extremely effective means for destroying enemy surface forces.** Enemy surface forces that have been fixed in place or trapped by the loss of their mobility can provide lucrative targets for air interdiction. Enemy forces attempting to move rapidly also are much more vulnerable to destruction by air interdiction. (Refer to vol. II, essay Q.)

(6) **Commanders should use interdiction to enhance destruction and pursuit of enemy forces.** While interdiction can contribute to success by hampering reinforcement and resupply, it also can contribute by trapping enemy forces or channeling their maneuvers, thus leading to their destruction in detail. (Refer to vol. II, essay Q.)

c. **Close air support is the application of aerospace forces in support of the land component commander's objectives.** Since it provides direct support to friendly forces in contact, close air support requires close coordination from the theater and component levels to the tactical level of operations. Close air support produces the most focused and briefest effects of any force application mission; consequently, close air support rarely creates campaign-level effects. Although close air support is the least efficient application of aerospace forces, at times it may be the most critical by ensuring the success or survival of surface forces. Airmen advising surface commanders must understand the operational difficulties in close air support, the importance of prompt exploitation by surface forces, and the risks involved for friendly surface and aerospace forces; all of which demand exacting command and control. An air commander must ensure these operational limitations are fully appreciated so that close air support will be performed in a way that best supports the combatant commander's intent. (Refer to vol. II, essay Q.)

(1) **Close air support should usually be massed to apply concentrated combat power.** When applied in mass, close air support has immediate physical and psychological effects on enemy capability. Mass also can saturate enemy aerospace defenses making the risk for aerospace forces less than if they were employed piecemeal in terms of time or geography. (Refer to vol. II, essay Q.)

(2) **Close air support should create opportunities.** Close air support should prepare the conditions for success or reinforce successful attacks of

surface forces. Close air support can help create breakthroughs, cover retreats, and guard flanks. In effect, close air support can provide another maneuver element for employment in cooperation with surface combat elements. Close air support can be most effective at decisive points in a battle. (Refer to vol. II, essay Q.)

(3) **Close air support should be planned and controlled to reduce the risk of friendly casualties.** Fratricide can have a devastating impact on the ability of surface forces to exploit opportunities created by close air support in future as well as current battles. Fratricide also is likely to make aerospace forces excessively cautious, handicapping their ability to create opportunities for surface forces. (Refer to vol. II, essay Q.)

ROLE	TYPICAL MISSIONS
FORCE ENHANCEMENT (Multiply Combat Effectiveness)	Airlift Air Refueling Spacelift Electronic Combat Surveillance and Reconnaissance Special Operations

3-6. The force enhancement role both enables and improves operations of aerospace and surface forces. The missions within the force enhancement role are vital to aerospace and surface campaigns. In some situations, force enhancement may be the major contribution aerospace forces make to a campaign. (Refer to vol. II, essay S.)

a. **Sufficient strategic and theater airlift must be available to respond quickly to worldwide threats and to sustain deployed aerospace and surface forces.** When time is a critical factor, airlift is often the only means of transporting forces rapidly enough to the point of crisis. Airlift may be the only practical method of sustaining those forces with critically needed supplies and equipment. In addition, airlift must be able to clandestinely insert and extract small numbers of personnel in denied territory. (Refer to vol. II, essay S.)

(1) **Airlift's key enhancement of the campaign is its ability to place properly concentrated combat forces where and when needed.** Aerospace power's flexibility allows the commander to deploy

forces within theater or from the United States and other theaters. (Refer to vol. II, essay S.)

(2) Because strategic and theater airlift capacities are finite, the air component commander must recommend priorities for their use. Strategic and theater airlift must be systematically coordinated with each other and with other transportation means to achieve the proper concentration of aerospace and surface forces at the proper time. (Refer to vol. II, essay S.)

b. Sufficient air refueling capability must be available to exploit aerospace power's unique flexibility. The ability of aerospace power to concentrate force anywhere against any facet of the enemy may depend on sufficient air refueling capability. (Refer to vol. II, essay S.)

c. Rapid-response spacelift must be available to emplace and replace critical space assets. The US military relies extensively on space assets for many critical missions. In a crisis, it may be necessary to concentrate assets quickly. Failure of these assets or their destruction by enemy action could lead to disastrous consequences unless they can be quickly replaced. (Refer to vol. II, essay S.)

d. Electronic combat must be integrated with other missions to reduce the dangers aerospace and surface forces face while increasing their ability to accomplish campaign objectives. Aerospace electronic combat assets have a wider field of influence than surface-based assets. Thus, aerospace assets are best suited to coordinate and control joint or combined electronic combat resources in a mutually supporting campaign. (Refer to vol. II, essay S.)

(1) Electronic combat, like aerospace control, should be employed to gain a needed degree of freedom of action. Gaining control may not require physical damage. Electronic combat is often most useful when it is selective, subtle, and hard to detect. (Refer to vol. II, essay S.)

(2) Electronic combat must respond to the changing combat environment. Electronic combat measures and countermeasures can be expected to cause an enemy response; continued effectiveness depends on interweaving electronic combat activities with appropriate surveillance, reconnaissance, and intelligence efforts. (Refer to vol. II, essay S.)

e. Surveillance and reconnaissance must operate together, enabling commanders to preserve forces, achieve economies, and ac-

complish campaign objectives. When properly integrated, surveillance and reconnaissance produce greater results than the sum of their separate efforts. The situational awareness that comes from effective surveillance and reconnaissance enables the commander to exploit the potential of aerospace forces. (Refer to vol. II, essay S.)

(1) Surveillance must be designed to provide warning of enemy initiatives and threats and to detect changes in enemy activities. Air- and space-based surveillance assets can exploit their elevation to detect enemy initiatives at long range, making them essential to the security of aerospace and surface forces. (Refer to vol. II, essay S.)

(2) Reconnaissance must respond to surveillance and intelligence cues to obtain detailed information on matters of particular importance. Finite reconnaissance capabilities must be used carefully to gain an optimum—rather than a maximum—amount of useful information. (Refer to vol. II, essay S.)

f. Often Air Force special operations is an integral part of any unconventional warfare, direct action, special reconnaissance, or counterterrorism mission. It may be the only practical method of penetrating or extracting a force deep in hostile or politically sensitive areas without detection.

(1) A special operations infiltration/exfiltration mission is an integral part of the operational plan and must be tailored to specifically support ground or maritime force actions on the objective, the ground reconnaissance plan of action, or unconventional warfare movements or resupply. The infiltration/exfiltration mission plan is critically dependent upon detailed real-time intelligence and must have the flexibility to adjust to changes in the enemy's air defense or his disposition in the objective area.

(2) Often times other missions must be integrated to support a special operation and vice versa. Support may come from other services, as well as the Air Force. These missions must be coordinated with or under the control of the joint special operations air component commander (JSOACC). If the special operation is part of a larger contingency operation or conventional action, the JSOACC must coordinate his actions with the higher level joint forces air component commander. This coordination is particularly important for special operations infiltration or exfiltration missions where failure to deconflict can cause the loss of surprise and mission failure in the objective area.

ROLE	TYPICAL MISSIONS
FORCE SUPPORT (Sustain Forces)	Base Operability and Defense Logistics Combat Support On-Orbit Support

3-7. The force support role provides the ability to mount and sustain aerospace operations. Aerospace forces depend on surface bases, require large amounts of consumable stores (food, water, fuel, munitions), and particularly depend on highly technical maintenance, including spares. In addition, airmen require at least rudimentary human services if they are to function effectively. (Refer to vol. II, essay T.)

a. **Air and launch base operability and defense must be major considerations in campaign planning and execution.** Bases are natural targets for any enemy (see para. 3-4c(2)). The abilities to provide and defend these bases and to resume operations

quickly after an enemy attack are crucial to aerospace operations. Base design, operating procedures, manning, and supply must be accomplished with construction feasibility and postattack operability as leading considerations. (Refer to vol. II, essay T.)

b. **Logistical capabilities must be designed to survive and operate under attack; that is, they must be designed for combat effectiveness, not peacetime efficiency.** Since the dawn of military history, logistical capabilities have controlled the size, scope, pace, and effectiveness of military operations. Aerospace logistical capabilities are equally important and equally likely to be prime targets for hostile attack. (Refer to vol. II, essay T.)

c. **Aerospace forces must have combat support to remain effective for extended periods.** The lack of sufficient combat support can limit or prevent operations entirely. Determining the necessary minimum of combat support is a key employment planning concern. (Refer to vol. II, essay T.)

d. **On-orbit support for space assets can be crucial to campaign success.** The growing importance of space assets in military operations demands the ability to control, repair, and otherwise support these assets in a timely manner. (Refer to vol. II, essay T.)

Section D

AIRMINDEDNESS

Chapter one discussed warfare in broad, traditional terms. Chapters two and three presented what airmen have learned about aerial warfare during its *short* history. Because that history comprises only eighty years, it is not surprising that traditional, two dimensional surface warfare concepts dominate military thinking. Yet, if military power (including aerospace power) is to reach its full potential, all aspects of warfare must be reexamined from the aerial or three dimensional perspective. Thus air leaders have stressed the importance of developing an aerial mindset—"airmindedness."

Figure 3-1 presents an airman's reassessment of the principles of war. *This viewpoint is not presented here as doctrine*, although the reader will find air doctrinal principles laced throughout. Rather it illustrates the mindset airmen should develop as they think through their form of military power and then apply to their profession of arms.

An Airman's View

(Refer to vol. II, essay U.)

Objective

- The objective is always important, but it is especially so in aerospace warfare because of the range of options available.
- Airmen are not constrained to achieving tactical objectives as a prerequisite to obtaining strategic objectives.
- Aerospace forces can pursue tactical, operational, or strategic objectives—or all three at the same time.

(Continued on next page)

Offensive

- Aerospace forces are inherently offensive—even when defending, they attack.
- Aggressive defeat of the enemy's aerospace forces is the airman's first priority in warfare—it makes all other operations possible.

Unity of Command

- Unity of command is important for all forces, but it is critical to prudent employment of aerospace forces.
- Aerospace power is the product of multiple aerospace capabilities. Centralized command and control is the key to fusing these capabilities.
- The momentary misapplication of aerospace forces is much more likely to have immediate strategic consequences than is the case with surface forces.

Security

- The lethality of aerospace forces makes the security of friendly forces from enemy air power a paramount concern.
- Security may require the elimination of the enemy's aerospace capabilities.

Surprise

- Surprise depends on initiative and is made more attainable by the versatility of aerospace power.
- Where, when, or how an enemy is struck is relatively independent of where and how aerospace forces are postured. Choice of time and place always rests with the commander of superior aerospace forces.
- Compared to land and sea forces, terrain and distance are not inhibiting factors for aerospace forces.
- Surprise is aerospace power's strongest advantage.

Simplicity

- Planning, logistics, and administrative support are complex for all types of forces but, generally, are less so for aerospace forces compared to surface forces possessing equivalent combat power.
- The fluid, featureless, boundless nature of the aerospace environment makes the execution of aerospace operations elegantly simple compared to that of surface forces.

Mass and Maneuver

- The speed with which aerospace forces maneuver in three dimensions allows them to achieve mass faster than surface forces.
- The commander of forces operating in three dimensions does not sacrifice maneuver when mass is achieved—mass and maneuver can be employed simultaneously.
- The simultaneous employment of mass and maneuver by aerospace forces creates tremendous leverage when applied against surface forces.

Economy of Force

- It is ironic that this principle was so well developed before the advent of air power. It describes precisely the greatest vulnerability of aerospace power.
- The misuse of aerospace power can reduce its contribution more than enemy action.
- Because aerospace power is precious, it must be conserved by caring and competent airmen.

Figure 3-1 (cont'd).

Chapter 4

Preparing the Air Force for War

To be prepared for war is one of the most effectual means of preserving peace.

George Washington

The Department of the Air Force is assigned a variety of primary and collateral functions and responsibilities. This chapter, building upon the ideas presented in the previous chapters, provides guidance on how the Air Force must organize, train, and equip its aerospace forces so that it can carry out these functions and responsibilities.

Section A

Air Force Aerospace Power

4-1. The Air Force should be in the forefront of developing and exploiting aerospace power. Aerospace forces directly assigned to surface forces have surface support mission priorities that limit their ability to exploit the full scope of aerospace operations. For example, Army and Marine aerospace forces are organized and designed to give first priority to immediate and close support of ground forces. Likewise, naval aerospace forces, as a priority, support fleet operations. In contrast, only the Air Force is charged with preparing aerospace forces that are organized, trained, and equipped to exploit fully aerospace power's flexibility and potential decisiveness. (Refer to vol. II, essay V.)

a. **The Air Force should be prepared to fight as a member of an interdependent team of land, naval, and aerospace forces.** This interdependence demands attention to joint and combined requirements when organizing, training, and equipping the Air Force. (Refer to vol. II, essay V.)

b. **Attaining the full potential of aerospace power requires a continuous search for better ways to organize, train, and equip the Air Force.** The success of this search depends on a keen aware-

ness of how changes in one area (organization, training, or equipment) often require changes in one or both of the other areas. (Refer to vol. II, essay V.)

Section B

Organizing Air Force Aerospace Power

4-2. Air Force elements should be organized for wartime effectiveness rather than peacetime efficiency. Although peacetime efficiencies are in constant demand, they can be self-defeating if they hinder rapid and effective transition from peace to war. (Refer to vol. II, essay W.)

a. **The Air Force should organize to make full, effective, and coordinated use of its total force.** Reserve and National Guard forces comprise a major portion of Air Force aerospace power. The effective integration of the total force must have a high priority in Air Force organizational decisions. (Refer to vol. II, essay W.)

b. **Organizational structures should be designed to exploit aerospace power's versatility and to make aerospace forces responsive, flexible, survivable, and sustainable.** The ability to use aerospace forces against any level of objective, whether independently, in support of, or supported by other components, requires organizations that do not constrain employment concepts. Speed and flexibility are required if forces are to cope with the unexpected in modern, fast-paced warfare. Survivable forces must be able to sustain the fight with the proper balance of people, concepts, and equipment. Success in war demands aerospace organizations that

effectively integrate personnel policies, operational and logistical concepts, and equipment requirements. (Refer to vol. II, essay W.)

(1) Air Force units should be organized to best harness people, equipment, and operational methods in effective arrangements to accomplish assigned missions. Mission success, especially for aerospace forces, depends on organizations possessing flexibility to adapt to rapidly changing circumstances and to exploit new technical capabilities. Operational effectiveness and survivability are key considerations. (Refer to vol. II, essay W.)

(2) Air Force units should be organized to enhance self-defense capabilities and self-sufficient operations. All units should provide at least limited protection for their personnel and resources. Within a base, units should be organized to provide mutual support. Within a theater, bases should be organized for mutual support. Both units and bases should be organized so they can operate autonomously for limited periods. (Refer to vol. II, essay W.)

(3) Air Force forces should be organized to enhance centralized control and decentralized execution. To exploit the speed, range, flexibility, precision, and lethality that make aerospace forces so versatile, their organization must make it possible for missions to be centrally controlled. The need to respond to and exploit unforeseeable events requires these same forces to be capable of decentralized mission execution. (Refer to vol. II, essay W.)

Section C

Training Air Force Aerospace Forces

4-3. People are the decisive factor in war. Although airmen tend to emphasize the importance of their equipment, how that equipment is used (the human factor) is far more important. Air Force personnel must be encouraged to develop professionally to the full extent of their capabilities and allowed sufficient time to pursue that development. Full professional development requires a balance of training, education, experience, and personal effort. (Refer to vol. II, essay X.)

a. Training should prepare aerospace forces for combat. Training has little value unless it is focused on the ultimate purpose of aerospace forces—to fight and win. (Refer to vol. II, essay X.)

(1) Training should be as realistic as possible. Aerospace forces must train as they plan to fight. Exercises must replicate to the extent possible the chaos, stress, intensity, tempo, unpredictability, and violence of war. Further, exercises must include “free-play” scenarios that emphasize innovative problem solving, rapidly changing situations, and degraded capabilities. Exercises that follow scripted scenarios tend to give an impression of competence which may well mask an inability to meet the exigencies of battle. (Refer to vol. II, essay X.)

(2) Combat performance rarely equals training performance. Even the most realistic training cannot accurately simulate the rigors of combat. Performance almost surely will suffer, at least initially, in combat. (Refer to vol. II, essay X.)

(3) Training should be rigorously evaluated. After-action reports from training exercises must be complete and accurate. Appropriate organizations and properly trained staffs must analyze and evaluate these reports to improve organization, training, and equipment. (Refer to vol. II, essay X.)

(4) Training should be conducted for all forms and levels of war. Training must prepare forces to operate effectively in war, regardless of its form. The demands and complexities of the tactical, operational, and strategic levels of war require comprehensive preparation. This preparation must include realistic and rigorous training and full analysis. Aerospace forces must be proficient at all levels if they are to respond successfully to military challenges. (Refer to vol. II, essay X.)

(5) Training should balance flexibility and cost. Flexibility increases as the number of well-trained personnel increases. Providing thorough training, especially to large numbers of personnel, usually requires long periods of time and significant amounts of money. Sufficient time and money must be provided if aerospace forces are to be truly flexible. (Refer to vol. II, essay X.)

(6) Special attention should be given to training for joint and combined employment. Success in modern war often depends on the synergies resulting from Air Force aerospace forces working closely with forces provided by the other services and by allies. The amount of emphasis given to joint and combined training often depends on the specific capabilities of a particular aerospace platform. For example, Air Force units possessing assets with significant range and endurance are often the most ap-

propriate for maritime operations. (Refer to vol. II, essay X.)

(7) Air Force personnel providing training, advice, or other forms of support to other air forces should fully understand the context within which the support is supplied. To provide effective support to friends and allies, Air Force personnel should not only understand the precise nature of the threat but also should be able to blend support into the needs and capabilities of the host nation. These capabilities require that Air Force personnel understand the affected social and cultural environment (especially language requirements), the technical and procedural limits of US military systems within that environment, and the political nature of the objective. (Refer to vol. II, essay G.)

b. Professional military education should encourage critical analytical thought, innovative problem solving, and sound professional judgment. An objective approach to the problems of war and specialized competence in the operational and strategic employment of aerospace power should be the product of Air Force professional military education. Such an approach is essential to excellence in the military art, to the ability to exploit fully the versatility of aerospace power, and to the derivation of effective doctrine from experience. Professional military education must be a career-long process. (Refer to vol. II, essay X.)

c. Commanders at all levels should provide experience in both depth and breadth for their subordinates. Experience puts training and education into practice, enhances judgment, and provides a base of practical knowledge for later assumption of senior command and staff responsibilities. (Refer to vol. II, essay X.)

d. Every airman, of whatever rank, should be personally committed to making maximum use of training, education, and experience opportunities. Each individual must take the initiative to learn and understand as much as possible about the complexities of warfare. Such personal effort is the mark of the professional and is the key to the success of any Air Force professional development program. (Refer to vol. II, essay X.)

e. Every officer (commissioned and noncommissioned) should make the professional development of subordinates a high-priority task. Painstaking preparation is required to sustain the quality of Air Force leadership in peace and war. All officers should be accountable for the professional

development of their subordinates. (Refer to vol. II, essay X.)

Section D

Equipping the Air Force

4-4. The Air Force should place particular emphasis on power projection capabilities in equipping the force. The capabilities of being able to concentrate rapidly at any point on or above the globe and of being able to attack any segment of the enemy's war-making capability must be preserved and exploited through the procurement of appropriate equipment. (Refer to vol. II, essay Y.)

a. The range, endurance, payload, precision, and survivability of Air Force platforms are key factors in the ability to project power effectively. The inherent performance characteristics of aerospace platforms are enhanced by such measures as air refueling, precise weaponry, and self-protection. (Refer to vol. II, essay Y.)

b. Equipment should be designed and procured to minimize the vulnerabilities of aerospace power. Design and procurement decision makers must pay great attention to the vulnerability of platforms on the ground as well as in the aerospace environment. Ground time required for maintenance, refueling, rearming, or other support functions increases vulnerability. In general, the more dependent aerospace platforms are upon main operating bases or launch facilities, the more lucrative targets those bases and launch facilities become. (Refer to vol. II, essay Y.)

c. Reliability and maintainability should play a central role in equipment procurement decisions. These considerations are crucial to combat capability and operational supportability. Improved reliability and maintainability reduces manpower and operating and support costs. Logistic requirements must be a major part of the procurement process from its beginning. (Refer to vol. II, essay Y.)

d. Interoperability should be a major consideration in equipment mix and structure decisions. Effective joint and combined operations require functional and technical interoperability among the military branches and allies. Interoperability is especially important to the success of close air support and other missions that are inherently joint. (Refer to vol. II, essay Y.)

e. **Equipment procurement decisions should balance cost and capability against numbers.** Sophisticated capabilities usually have high costs and such expense limits the number of assets that can be bought. Numbers do count, and the lack of adequate force size can prevent the Air Force from fully ex-

ploiting the flexibility of aerospace power. Capabilities and numbers (quality and quantity) must be appropriately balanced, based on current and projected threats, employment concepts, and projected attrition. (Refer to vol. II, essay Y.)

BY ORDER OF THE SECRETARY OF THE AIR FORCE

OFFICIAL

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SUMMARY OF CHANGES

This manual provides updated guidance to the Air Force for preparing and employing aerospace forces. It has been completely reorganized in two volumes. Volume I is a quick-reference guide containing only the outline of our basic doctrine. Volume II expands upon the doctrinal statements in volume I, providing evidence in the form of documented essays. Thus, understanding of Air Force doctrine requires thorough study of volume II.

Within volume I, the doctrine is organized in chapters using a building-block approach—understanding the doctrine requires that the chapters be read in order because each chapter lays the foundation for succeeding chapters. Chapter 1 provides the context for aerospace power by addressing the nature of warfare. Chapters 2 and 3 represent the Air Force's understanding of the nature and use of all forms of aerospace power. Chapter 4 concerns only the Air Force and focuses on its assigned role of organizing, training, and equipping aerospace forces.

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