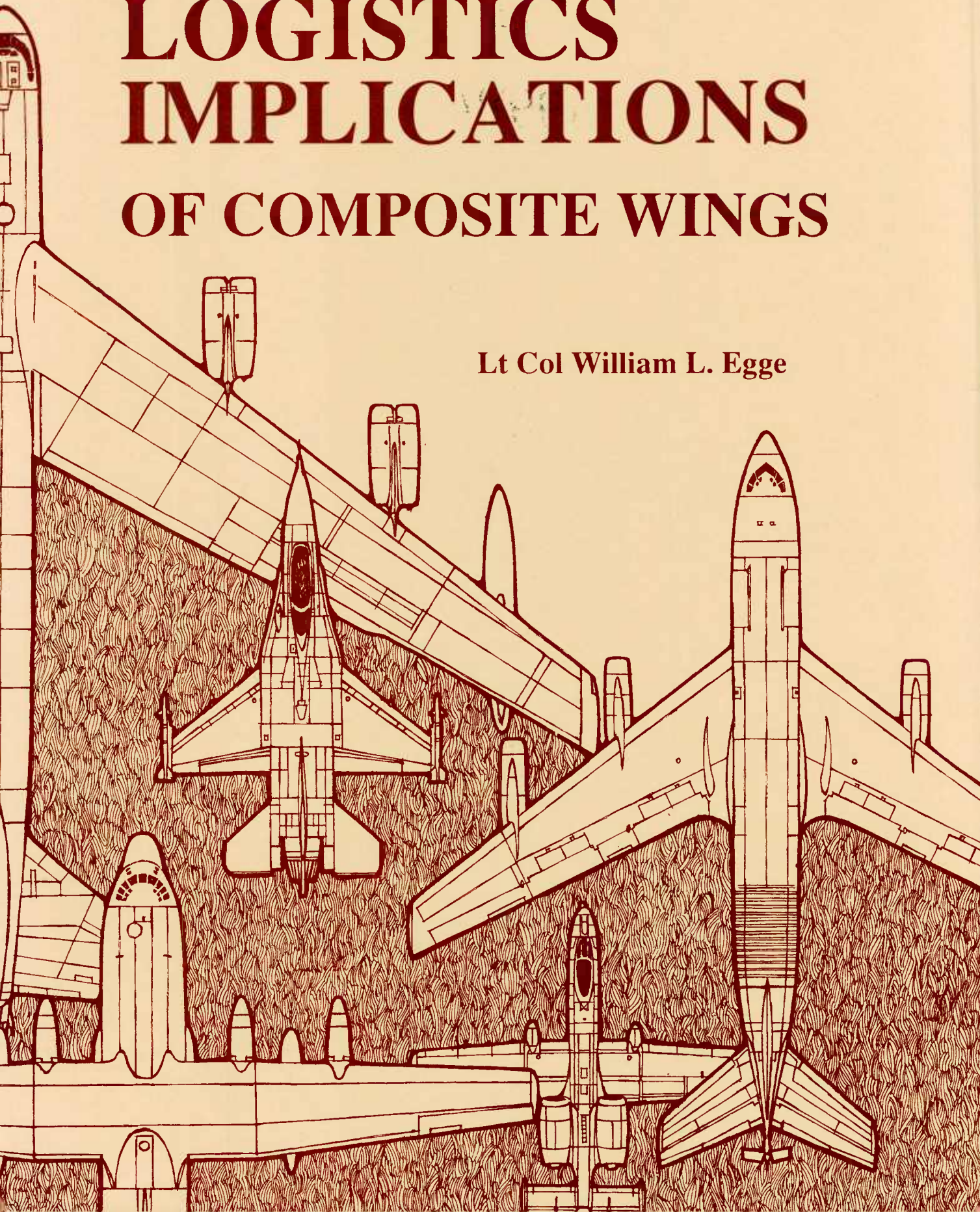


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LOGISTICS IMPLICATIONS OF COMPOSITE WINGS

Lt Col William L. Egge





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Logistics Implications of Composite Wings

by

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This publication has been reviewed by security and policy review authorities and is cleared for public release.

*Dedicated
to the memory of
a fellow officer
and fallen aviator,*

Captain Warren Jesse Klingaman

4 August 1962 to 6 February 1992

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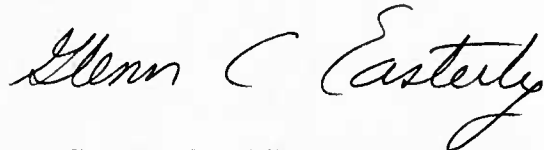
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Foreword

The US Air Force has taken the initiative to reorganize into objective wings, at least two of which will be uniquely formed as composite wings with a mixture of combat and combat-support aircraft. At the same time, there is a decrease in Air Force size to meet the demands of reduced funding. Therefore, the force that remains must be *effective* and *efficient*.

At the forefront of *effectiveness* will be the composite wings as the primary Air Force contingency response forces for regional conflicts. The composite wings must stand at combat-ready around-the-clock. To maintain a combat degree of readiness, the composite wings must have a high level of logistics support. That logistics support in a peacetime environment must meet the demands of *efficiency* in the modern-day budget predicament.

This study summarily examines the impact of composite wings on logistics support requirements. The needs and capabilities of composite wing organizations are considered; contingent issues are identified; conclusions are drawn; and recommendations are made.

A handwritten signature in black ink, reading "Glenn C. Easterly". The signature is written in a cursive, flowing style with a large, stylized 'G' and 'E'.

GLENN C. EASTERLY, Col, USAF
Air Force Materiel Command Chair
Air University

About the Author



Lt Col William L. Egge

Lt Col William ("Bill") L. Egge is a native of Pensacola, Florida. Bill enlisted in the Air Force in 1967. He began his Air Force career as an F-102 radar weapon system specialist and worked on the flight line at Ramstein Air Base (AB), Germany, until 1971. When the F-102 was replaced by the F-4E, a cross-training found Bill attending television maintenance technical school at Fort Monmouth, New Jersey, where he was an honor graduate. He then went to Little Rock Air Force Base (AFB), where he maintained the surveillance television systems for the 18 Titan II missile sites located throughout northern Arkansas. At the same time he attended night courses at local universities and gained acceptance into the Airman Education and Commissioning Program (AECPP). In 1974, Bill attended Florida State University and graduated *cum laude* with a bachelor of science degree and a specialization in management information systems. He was commissioned in October 1976 and was assigned to Headquarters Tactical Air Command to work as an E-3 Airborne Warning and Control System (AWACS) computer systems analyst. This assignment was followed by a tour in 1980 at Tinker AFB, Oklahoma, as an E-3 AWACS weapons director and, later, senior director. During this time, Bill also served on the wing staff working E-3 AWACS software enhancements and hardware improvement programs. Bill was subsequently assigned to the Oklahoma City Air Logistics Center in 1985 as an E-3 logistics management specialist and a member of the Block 20/25 Test Team. In 1986, Bill was assigned to Supreme Headquarters Allied Powers Europe (SHAPE), Belgium, where he served as the E-3 integration staff officer for adding software and hardware improvements in the NATO's 18 E-3A aircraft. In 1988, Bill completed the Communications-Computer Systems Staff Officer Course (CSSOC) at Keesler AFB. He was then assigned to the Air Force Logistics Operations Center where he helped revise the AFLC Logistics Command and Control Concept of Operations. Bill's next assignment, in 1989, was as the AFLC assistant chief scientist/engineer. In 1991, Bill was selected as the AFLC research fellow at

the Airpower Research Institute, Air University Center for Aerospace Doctrine, Research, and Education, Maxwell AFB, Alabama.

Bill has two daughters, Tracy and Sonya, and is married to the former Joyce E. Chamberlain, a major in the US Air Force. Joyce is from West Baldwin, Maine.

Acknowledgments

This publication would not have been possible without the help and guidance of a number of true experts in a wide variety of fields. I would like to ensure that I provide acknowledgment to as many as possible and only hope that the people I have failed to list will understand and accept my apology.

Each of the following individuals made a contribution to this endeavor: Maj Gen Edward R. Bracken, Maj Gen Norman Campbell, Col Phillip C. Clark, Col Dennis Drew, Col Glenn C. Easterly, Col Gregory A. Fowl, Col James D. Farrar, Col Silas Felton, Col Carlton Howard, Col Arnold J. Kampe, Col Tom McDaniel, Col Jarrett B. McGehee, Jr., Col Robert L. McKittrick, Col Russell Stafford, Col Peter G. Stauder, Col Phillip Williams, Lt Col Smoky Allen, Lt Col Price Bingham, Lt Col Richard Clark, Lt Col Bill Furr, Lt Col Suzanne Gehri, Lt Col Iris Hageney, Lt Col Robert E. Johnson III, Lt Col Dan Kolpin, Lt Col Bob Mansfield, Lt Col Niemiec, Lt Col Thomas Nowak, Maj Jim Duke, Maj Gail Lundberg, Maj Jim Moschgat, Maj Valla Oliver, Maj John Pardo, Maj Tom Shimchock, Maj Gary Turnipseed, Capt Mike Morabito, Dr David MacIsaac, Mr Jerry Klingaman, Ms Melrose Bryant, Mr Preston Bryant, Mr John Folkeson, Mr Steve Garst, Ms Dot McCluskie, Mr Jerome G. Peppers, Mr Ray Pyles, and Dr Bill Suit.

While the contributions have been many and from a wide assortment of areas, the end result is the work of the author and all errors of commission and omission are mine and mine alone.

Chapter 1

Introduction

Air Force Chief of Staff Gen. Merrill A. McPeak has directed his staff to draw up plans for formulating two new mixed-aircraft wings from units based in the US. The two wings are to have an initial operating capability by 1993.

—Aviation Week & Space Technology

The 1990s will probably be characterized as a decade that witnessed the most dramatic and innovative changes in the US Air Force since its formal founding as an independent service in 1947. In some ways, these changes constitute a return to the organizational structure of the Air Force, circa 1947. The contemporary military environment is experiencing significant modifications due to the absence of a clearly defined antagonist, economically driven budget reductions, and the resulting US Air Force organizational restructuring. Current political and fiscal changes have forced a rethinking of how to adapt the Air Force to meet future national defense challenges.¹

In the early 1950s, the introduction of a limited warfare concept prompted the Air Force to consider how to prepare in peacetime to respond to real-world conventional threats. One of the important results was the establishment of Tactical Air Command's Nineteenth Air Force and the formation of the Composite Air Strike Force (CASF).² The CASF was a blend of various assigned operationally ready units. The combat units maintained their peacetime basing at various locations throughout the US. When a contingency operation was directed, the Nineteenth Air Force brought these dispersed units together at a deployment location to form a combat-ready composite force.

Forty years later, the Air Force is again in the process of changing organizational structures to acclimate to a change in the world environment and also to a reduction in budget resources. Additionally, operational deficiencies in peacetime basing and in existing command and control networks have added to the rationale for change.³ In an interview with *Air Force Magazine*, the USAF chief of staff, Gen Michael J. Dugan, provided the following additional explanation:

Is the Air Force properly set up to employ airpower around the world?

"We're marvelously structured to do that," General Dugan replied. "If we're told to put aircraft over the Persian Gulf, for example, we can do it in hours." So why bother changing the Air Force's structure? General Dugan's reply, in summary: to make it even better and because the increasing quality, reliability, and standardization of modern Air Force aircraft open the way to new force structures that were formerly impractical.⁴

The Air Force is moving forward with a force reduction which some have called the real post-World War II demobilization.⁵ The reduction is being treated as a shaping of combat capability for future potential conflicts, not simply as a linear reduction of existing assets and personnel across the board. One of the thrusts of that reshaping is the introduction of two and possibly three composite wing prototypes.⁶

In the words of Defense Secretary Richard B. Cheney, "Every time we've made reductions in the past, we've screwed it up."⁷ This time, Air Force leaders are earnestly striving to maintain the best combat capability possible through a reorganization of the Air Force and a new approach to the way we prepare for war. Logistics is an integral part of that redesign.

By 1993, the U.S. Air Force will develop two composite tactical air wings that combine different types of aircraft in the same unit. The new wings will serve as prototypes for the possible reorganization of the service's tactical force structure along more mission-oriented lines.⁸

The implementation of composite wings is not a new endeavor. The Air Force has had composite units in many forms throughout the history of the service.⁹ Providing logistical support for two, and possibly up to four, newly formed composite wings¹⁰ should not be a difficult task for Air Force Materiel Command (AFMC). AFMC is providing support for composite units, such as the Air Force Special Operations Command (AFSOC) located at Hurlburt Field, Florida, and the 57th Fighter Weapons Wing at Nellis Air Force Base (AFB), Nevada (fig. 1), and has done so for some time. Even combined wings, such as the F-15E and KC-10 unit at Seymour Johnson AFB, North Carolina, have not created any significant difficulties for Air Force Materiel Command



Figure 1. 57th Fighter Weapons Wing Aircraft. Composite wings are not a new entity for the US Air Force. The A-10, F-15, and F-16 aircraft operate and are maintained as a composite wing as shown in this photograph. Note that the tail flash shows the organizational letters WA.

because the organizational change was primarily administrative—same base, same weapon systems, but now one wing-level unit instead of two. The support system remained virtually the same.

Historically, industrial preparedness and mobilization planning have not been popular subjects. Aversion to preparations for war when there is no imminent threat tends to make for an attitude of indifference and apathy toward provision for industrial preparedness.¹¹

So, what are the logistics topics of interest for a composite wing study? Listed below are the logistics issues that are considered in this examination.

- Composite wings are stated to be a feasible concept based on the successful implementation of a “two levels of maintenance” system. How dependent are composite wings on the success of a two levels of maintenance system?¹²
- The peacetime basing of composite wings in the continental United States will cause an increased emphasis on deployment mobility. How can Air Force Materiel Command help to reduce the deployment burden?
- The prevailing fiscal focus on peacetime efficiency may cause problems in providing logistics support for composite wings. What will be the consequence on combat effectiveness for a composite wing?
- Composite wings will cause an increase in supply uncertainty because fewer aircraft of each type will be assigned. This will result in a reduced ability to predict maintenance requirements. How can the Air Force Materiel Command improve predictions for weapon systems requirements and allocation of scarce resources?

Purpose

Composite wings are the right approach to improve combat effectiveness; but it costs more to operate and maintain a composite wing than a traditional homogeneous wing. And this comes at a time when there is a national economic downturn. Therefore, the principal recommendation of this study will be to give the composite wings the logistics support they will need to survive.

The goal of this inquiry is to identify Air Force Materiel Command’s logistics support issues relative to the implementation of composite wing organizations. The primary purpose is “identify . . . issues.” At the end of this report will be a set of conclusions and recommendations.

The basis for conducting the study was formed through information gathered from each of the air logistics centers and from the major command and Air Staff action officers involved in the planning for the establishment of the composite wings. The text concentrates on what the five air logistics centers collectively foresee as issues that need to be recognized and addressed.

The scope of the research is generally limited to wholesale supply, maintenance, transportation, and management issues as the three core logistics functions for Air Force Materiel Command. The use of the term *air logistics*

center indicates a general application to each of the five depots within AFMC. It is not the intent of this study to debate the merits of composite wings.¹³ The author acknowledges that composite wings will be implemented and that the role of Air Force Materiel Command is to provide the best possible support to all Air Force organizations. This study attempts to identify and pursue those logistics problem areas that otherwise would inhibit the successful establishment and operation of a composite wing structure.

To get started, one needs to understand why composite wings were formed and how composite wings are to be employed before proceeding on to develop an appreciation of how the logistics support elements are affected.

Chapter 2 reviews the need for reorganization and the overall Air Force reorganization plan. It defines what an objective wing is and the difference between homogeneous wings, combined wings, and composite wings.

Notes

1. Dr Thomas S. Snyder, "A Brief History of Composite Forces in the United States Air Force," Office of History, Headquarters United States Air Forces in Europe, 22 February 1991, 1. The current military force reduction and reorganization is a repeat of an earlier time in history as discussed by Dr Snyder. "Following World War I, the United States entered a period of renewed isolationism and, believing that no world power threatened its security, rapidly demobilized its armed forces. The Army demobilized most of its air arm and replaced it with new peacetime organizations."

2. Brig Gen Henry P. Viccellio, USAF, "Composite Air Strike Force," *Air University Review* 9, no. 1 (Winter 1956-1957): 28.

3. Gen Merrill A. McPeak, USAF, "For the Composite Wing," *Airpower Journal* 4, no. 3 (Fall 1990): 8.

4. James W. Canan, "Back to the Future," *Air Force Magazine* 73, no. 10 (October 1990): 35.

5. Maj Gen Harold N. Campbell, USAF, in address on "Logistics" to the Air War College, Maxwell AFB, Ala., 9 January 1992.

6. Composite wings have endured a wide variety of names over time. Not all of the names are used in exactly the same context, however. The following names generally imply the same concept, although some vary in their peacetime structure or application:

- Air Intervention Wing
- Air Legion Plan
- Battlefield Attack Wing
- Combined Wing
- Composite Air Wing
- Composite Force
- Composite Air Strike Force
- Composite Strike Force
- Composite Tactical Air Wing
- Composite Wing
- "Gorilla"
- Mixed Wing
- Mixed-aircraft Wing

7. "Future Of Defense Budget Confronts Returning Congress," *Aerospace Daily*, 3 January 1992, 11.

8. "Air Force to Create Two New Composite Air Wings by 1993," *Aviation Week & Space Technology*, 14 January 1991, 26.

9. Maj James E. Moschgat, USAF, "The History of the Composite Wing: Back to the Future!" Thesis for the School of Advanced Airpower Studies (SAAS), Maxwell AFB, Ala., 12 May 1992. This thesis is an excellent study of the history of composite wing organizations. It also explores past and projected effectiveness in combat. See note 12 below.

10. Raymond A. Haeme, draft Booz-Allen & Hamilton study for Air Force Systems Command (AFSC), December 1991. This contracted study (AFSC) was part of a war-gaming report prepared by Booz-Allen & Hamilton. The reference included shows an assessment that projects that by the year 2015 there will be four formal composite wings in being. One composite wing would be assigned as a battlefield attack wing (Pope AFB) while the remaining three composite wings would be assigned as air intervention wings stationed in Air Combat Command (ACC) at Mountain Home AFB, in Pacific Air Command (PACAF) (probably at Kadena Air Base [AB]), and the last in US Air Forces Europe (most likely a base in England). Also see Deedee Arrington Doke and Chuck Vinch "Composite Wing Concept Takes Off," *Stars and Stripes* 50, no. 15 (28 April 1991): 10. In this article, the number of future composite wings was also hinted to be as many as four: "Air Force officials said the 7440th [Composite Wing] performance validated the composite wing concept. The number of wings the service would like to have is unclear, but previous statements by service officials indicate the long-range plan may be to have at least two in the United States and one each in the Pacific and Europe."

11. Elton T. White, *The Industrial Sector* (Washington, D.C.: National Defense University, 1979), 128.

12. Maj Chris J. Krisinger, USAF, "A Carrier Air Wing for the Air Force: Challenges for the Composite Wing," *Airpower Journal* 4, no. 1 (Spring 1992): 32-42. Major Krisinger argues for further investigation of continuing the previous three levels of maintenance system for composite wings. He would use the US Navy as an example.

13. There are a number of existing studies that have dissenting viewpoints on the merits of the composite wing. A thesis completed on 12 May 1992 by Maj James Moschgat, USAF, for the School of Advanced Airpower Studies, "The History of Composite Wing: Back to the Future!" presents two points for consideration: (1) Historically, the composite wing as a fighting force has not had the combat striking power (depth) necessary to fulfill the expected mission; (2) Doctrinally, a composite wing focuses on independent, decentralized mission execution for tactical employment rather than theaterwide objectives. Another point of view is from Maj John Pardo, USAF, in an Air Command and Staff College (ACSC) paper, "Composite Wings: Are They Really a Good Idea?" Maxwell AFB, Ala., 31 January 1992. This paper challenges the composite wing concept based on three main points: (1) The "train like you fight" capability is already fundamentally in place and will not be significantly improved through the implementation of composite wings; (2) The composite wings will not improve the difficulties of the current command and control systems, but will only compound the problems; (3) The ability to deploy a composite wing from a single location is much more difficult than past methods of gathering combat resources from a variety of locations (dispersal of the mobility burden). Maj John Guillot, USAF, prepared an ACSC paper dated 13 May 1991, entitled "The Composite Wing: Not An Effective Use of Tankers." In that paper, Major Guillot explains his rationale in three main points: (1) The centralized control tenet of airpower doctrine is violated by fragmenting the tanker fleet; (2) The decentralized control of the tanker fleet will cause shortages of service to other DOD components; (3) There is no mission-essential need to include tankers in a composite wing. In an article published in the US Naval Institute *Proceedings*, "Don't Reinvent the Wheel," January 1992, Comdr Daniel C. Duquette suggests that the US Air Force would be better served by following the example of the US Navy and establishing composite forces during the deployment phase, not the home base phase.

Chapter 2

The Reorganization Plan

Strange as it may seem, the air force, except in the air, is the least mobile of all the services because a squadron can reach its destination in a few hours, but its establishment, depots, fuel, spare parts and workshops, take many weeks and even months to develop.

—Winston Churchill

In May 1990, Air Force Secretary Donald B. Rice presented his guiding directions for the US Air Force in a white paper entitled *Global Reach—Global Power*.¹ The white paper set the stage for understanding that the mobility of air power assets is the fundamental key to the successful application of air power for the next 20 years.

Change Necessitates Innovation

“The White House yesterday declared the United States the sole world superpower.”² This declaration was reported in the *Washington Times* shortly after the conclusion of Desert Storm. The cold war ended unceremoniously after 40 years of military standoff between NATO and the Warsaw Pact. Due to the dissolution of the Warsaw Pact and the Soviet Union, the expectation for future use of United States national defense resources has shifted from defending against the threat of general global/nuclear warfare to engaging in regional/limited conventional warfare.³ Over the last several years, Air Force senior leaders, taking the political environment into account, have prepared a new strategy for the future of the Air Force.

General Dugan . . . saw the Iraqi incursion as much more than a unique, one-time threat. He called it “a classic demonstration of the kinds of contingencies we can expect in the future.”⁴

The fundamental change for the future is that instead of maintaining fighting forces in forward-deployed locations at probable trouble spots (garrison forces), we will now tend to keep forces within the continental United States (CONUS) and keep them (expeditionary forces) prepared for rapid worldwide deployment (fig. 2).⁵ This strategy is evident in the recent reductions witnessed within the European theater with the withdrawal of fighter wings and

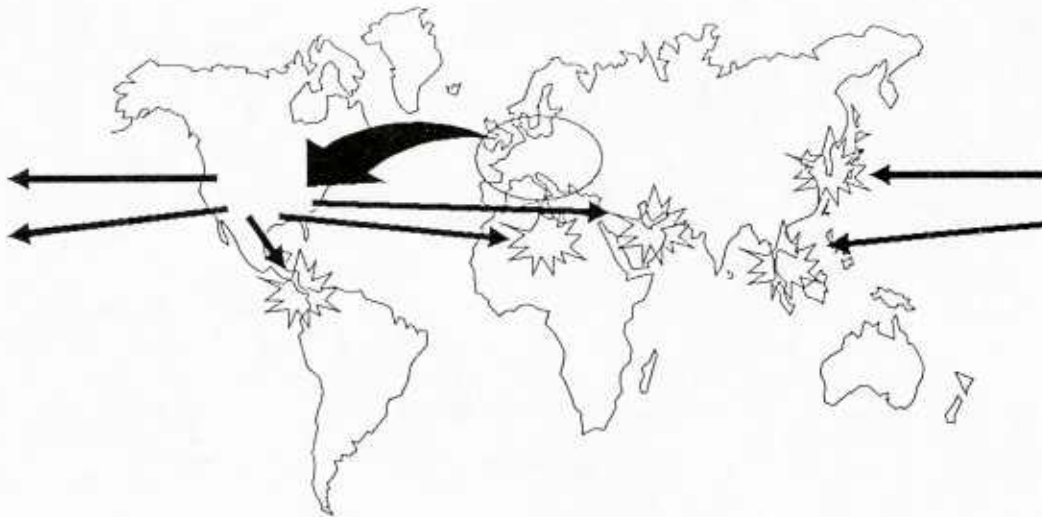


Figure 2. A Change in US Military Strategy. The basic tenet of the *Global Reach—Global Power* white paper is that there will be an increasing trend to withdraw military forces from overseas operating locations and react to future regional conflicts from the continental United States. The conflict areas shown are examples only and are not intended to show actual expectations.

closure of air bases. At the same time, the Air Force has shifted emphasis toward the establishment and use of composite wings based at Mountain Home AFB, Idaho, and Pope AFB, North Carolina, within the CONUS.

In the past, US air power has been applied almost exclusively outside the continental borders of the United States. While potential enemies have been unable to bring conventional war to the US, we have been able to export forces and the necessary logistics to battlefields at great distances. Recent examples include the Korean War, the Vietnam War, Operation El Dorado Canyon (Libya, 1986), operations Desert Shield and Desert Storm, and Joint Task Force Proven Force (Iraq/Kuwait, 1990–91). Other conflicts have been closer to the continental United States: Operation Urgent Fury (Grenada, 1983) and Operation Just Cause (Panama, 1989).

Secretary of the Air Force Donald B. Rice told Congress that USAF is intent on “designing and fielding forces that are highly mobile and quite flexible, forces that can hit hard and be used in alternative scenarios . . . across the spectrum of conflict.”⁶

This kind of thinking is not really new to the Air Force, despite the past three decades of military emphasis on strategic deterrence and the Warsaw Pact. Some senior leaders saw the need for a composite air force in the 1950s.

The United States could not afford to station forces in-being on a permanent peacetime basis in every locale, sufficient for any eventuality. But a small, lethal force, only hours away from any area of the world would be a deterrent, limited only by the effectiveness of the force and the time required to move it to a troubled area.⁷

Fiscal Constraints

At the same time that the political environment has changed, so has the United States economy. The national economy experienced a downturn over the last several years, adding significant pressures on the federal government to reconsider national budget priorities. Because the Department of Defense (DOD) portion of the national budget makes up approximately 60 percent of the available discretionary spending, it is the most popular target for budget reductions (fig. 3).

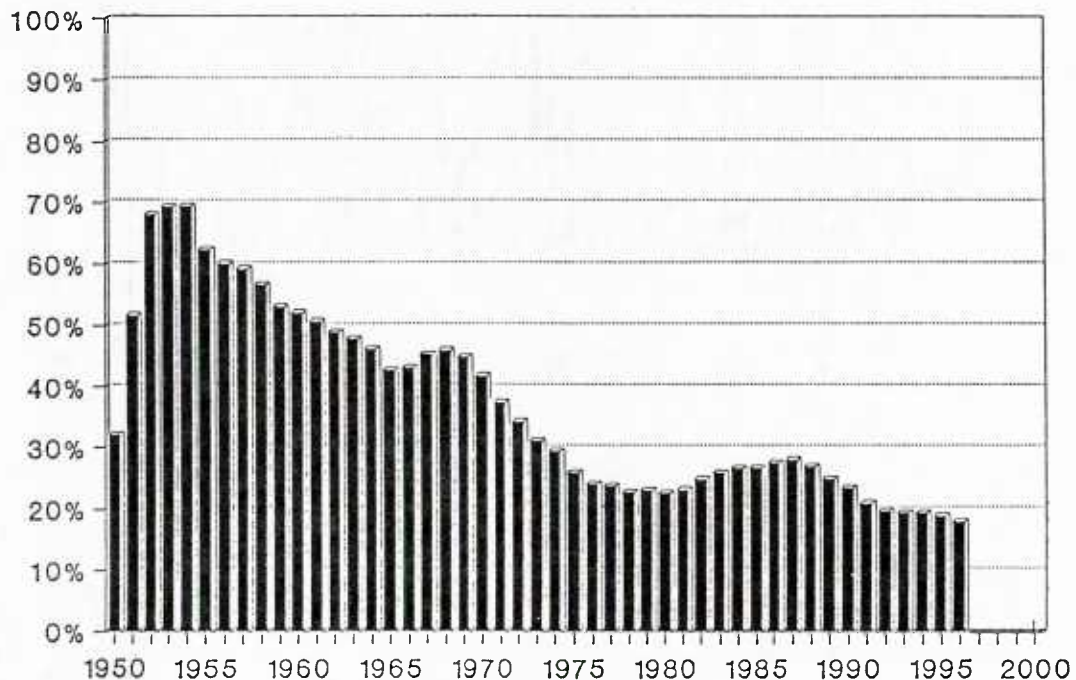


Figure 3. National Defense Outlays as a Percentage of the Federal Budget. The data shown for 1990 through 1995 are estimates.

Budget Reductions

The Air Force will be significantly revised during the next few years because of continued economic belt-tightening.⁸ There will be a smaller force structure in terms of aircraft, people, and operating budgets.⁹

The projected US defense budget through fiscal year 1995 continues a recently established trend—the 1990s will be a decade of military reductions. As a percentage of the US gross national product, the national defense outlays of 1995 will be at the lowest level since before the Korean War (fig. 4).¹⁰ The DOD, in an effort to respond to these budget reductions, has been using a dramatic set of recommendations developed to consolidate and improve DOD

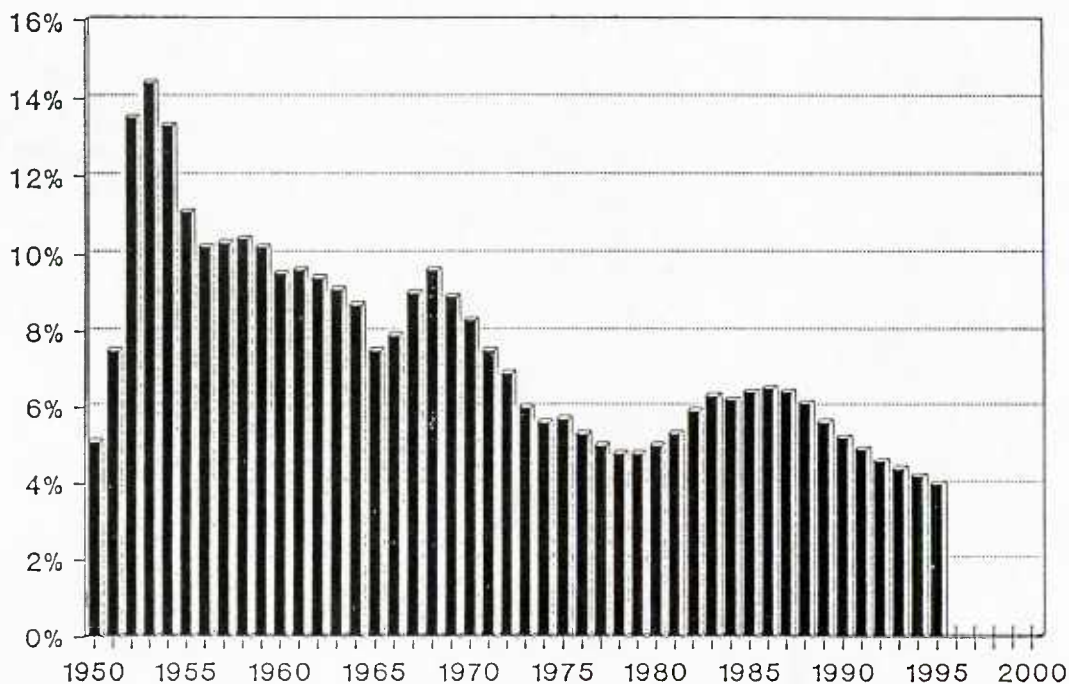


Figure 4. National Defense Outlays as a Percentage of the Gross National Product. The data shown for 1990 through 1995 are estimates.

operations. These recommendations are known as Defense Management Review Decisions (DMRD).

Defense Management Review

The Defense Management Review process began several years ago with the objective to streamline the Department of Defense operations and ultimately to reduce overall DOD spending. Many of the recommendations provide for consolidating like or similar functions among the services and for removing duplication of effort. These recommendations are concentrated on the business aspect of the military operation (efficiency) and do not appear to be focused on the aspect of combat effectiveness.

Pressures on the Air Force logistics system to continue to provide the best support possible will increase while, at the same time, the peacetime application of business guidelines and efficiencies forces the military to confront the "true costs of doing business."¹¹ AFMC will pursue improvements in standard business practices along with such DOD-directed changes as:

- **Reduce Supply System Costs.** DMRD 901 is aimed at reducing supply costs by improving management of the supply system, reducing the costs of supply operations, reducing levels of inventories, and tying the cost of doing supply business directly to the weapon system supported. While the changes

target efficiency, the question is raised as to the ability to continue to provide a responsive supply system to the customer—the combat forces.

- **Consolidation of Supply Depots.** DMRD 902 consolidates management of all service supply depot distribution functions into the Defense Logistics Agency (DLA) to achieve lower supply operating costs and increased efficiency.

- **Stock Funding Depot Level Reparables.** DMRD 904 establishes the use of a stock fund management system for depot level reparable items. This eliminates the previous system of free issue of depot level reparable (DLR) items to the using organization. This change puts the spares repair money in the hands of the operational units, which in turn provides the incentive to fix more items at the organizational level. DMRD 904 is counter to the two levels of maintenance concept.

- **Consolidation of Depots.** DMRDs 908 and 909 designate a single DOD manager for each of the major depot maintenance functions.

- **Consolidation of Automated Data Processing (ADP) Design and Development of Standard ADP System.** DMRDs 924 and 925 establish a DOD-wide information management system and centralization of software design activities.

- **Consolidation of Inventory Control Points.** DMRD 926 transfers most of the service's consumable inventory control points to the centralized control of the Defense Logistics Agency.

Air Force Materiel Command has taken great strides to remain in step with ongoing budget reductions by adapting the logistics process to the “new” Air Force. Some of the AFMC initiatives previously taken were also geared to provide improved weapon system support.¹² Examples include implementation of the Logistics Management Systems (LMS) Modernization Program¹³ and a major reorganization of the air logistics centers into product directorates in which almost all resources contributing to support of a given weapon system are assigned directly to that function.¹⁴ This reorganization reflects a shift from the mercantile approach of managing by Federal Supply Class (FSC) to an integrated approach of managing by weapon system. A single position is designated as the responsible system manager from the inception of the weapon system until its final release from the Air Force. This program is known as the Integrated Weapon Support Management (IWSM) program.

Force Structure Drawdown

The decline of the Soviet threat has fundamentally changed the concept of threat analysis as a basis for restructuring. The real threat we now face is of the unknown, the uncertain.¹⁵

How much force reduction is required? What is expected of the defense establishment? Economic pressures are driving the defense budget down

without a quantifiable minimum threshold. The Department of Defense is in the process of attempting to define strategic and tactical threat scenarios against which the military force structure should be designed. But for now, the appropriate level of defense force structure is unknown. Under the Joint Chiefs of Staff Base Force Concept, the force structure is expected to reduce to the levels shown in table 1.

Table 1
The Projected Force Structure

	<i>Current</i>	<i>FY 1995</i>
Army Divisions	26	18
Active	16	12
Reserve	10	6*
Cadre		2
Marine Corps Divisions	4	3.3
Active	3	2.3
Reserve	1	1
Navy Ships	528	450
Amphibious	65	50
Attack Subs	87	80
Carriers**	14	12
Carrier Air Wings	15	13
Active	13	11
Reserve	2	2
Sealift	16	1
Fast sealift ships	8	8***
Prepositioned ships	8	8***
Air Force		
Fighter Wings	34	26
Active	22	15
Reserve	12	11
Strategic Bombers	268	181

Sources: House Armed Services Committee, "Planning the Nation's Defense," *Congressional Quarterly Weekly Report*, 29 February 1992, 478; and Briefing, Comdr Steve Hill, JCS/J-8, Joint Staff Program and Budget Analysis, subject: The Base Force, Washington, D.C., August 1991.

* Does not include leadership cadres for two additional divisions.

** Does not include one carrier for training.

*** Does not include a pending proposal to spend \$3 billion for 20 or more additional sealift and prepositioning ships.

Note: A division usually includes 17,000 to 20,000 troops; an Air Force fighter wing typically includes 72 planes.

Before 1992, the Air Force maintained 36 combat wings (approximately 3,600 combat aircraft). It is expected to reduce to 26.5 combat wings (approximately 2,650 combat aircraft) by 1995. President George Bush an-

nounced a 30 percent (maximum) reduction of forces in his State of the Union address on 28 January 1992. However, Congress is continuing to review the force structure relative to the present and projected world situation and may pursue even deeper cuts in the active force structure over those originally planned. Although not confirmed by the Air Force, the *Defense News* published a report in January 1992 that indicated Air Force planners are preparing for a future force structure that may consist of as few as 21 fighter wings.

US Air Force planners have resigned themselves to an air combat force of 21 wings by 1996, with tactical aircraft and strategic bombers sharing increasingly scarce operation, maintenance and training funding under the reduced fleet.¹⁶

Most, if not all, of the actual force reductions will come from the active units. Thus, there will be a relative increase in the importance of the Air Force Reserves and the Air National Guard.

The point is that major force structure changes are coming. Even if the estimated numbers used in this study are only approximately correct, the Air Force is actively looking for a better way to put together a fighting force that preserves combat capability. Part of the solution has been advertised to exist in the establishment of composite wings.

Restructuring the Air Force

The thought is that we could do a better job of organizing and planning in peacetime . . . so that we can operate on day one the way we might have to be called upon to operate when deployed for potential conflict.¹⁷

Given the facts that (1) political and economic considerations are the primary driving forces to a reduced force structure and (2) Secretary Rice has provided the direction in terms of *Global Reach—Global Power*, the Air Force must reorganize. It must establish maximum combat capability with its available assets to meet the national defense needs for air power. Such is the purpose of *Air Force Restructure*, the second white paper published by the secretary of the Air Force.¹⁸

The five basic themes advocated by Secretary Rice for the organizational restructuring are: (1) strengthen the chain of command, (2) decentralize, (3) consolidate resources, (4) streamline and flatten organizations, and (5) clarify functional responsibilities.¹⁹

Of principal interest for purposes of this paper are the proposal for developing a conceptual model for an objective wing, combining Air Force Logistics Command (AFLC) and Air Force Systems Command (AFSC) into Air Force Materiel Command, and establishing Air Combat Command by deactivating and combining elements of Tactical Air Command (TAC) and Strategic Air Command (SAC).²⁰

The Objective Wing

What is an objective wing? One base, one wing, one commander. The objective wing is an operational wing organized to give the wing commander and the squadron commanders more control over those elements that contribute to or affect the wing's operational mission. It is an organizational model for how senior Air Force leaders envision the operational wing of the future. The metamorphosis from the old wings of the tri-deputy configuration began with an April 1991 prototype test that used the 347th Fighter Wing at Moody AFB, Georgia.²¹

The 347th Fighter Wing's three deputy wing commander slots—one each for operations, resources, and maintenance—will be replaced by an operations group and a logistics group.

The wing's aircraft maintenance units will report directly to their respective squadron commanders instead of the wing's deputy commander for maintenance.

Maintenance, air traffic control, base operations, and weather forecasting functions will be consolidated into an operations support squadron instead of reporting to a deputy wing commander.

The changes . . . will have the effect of vesting more authority and responsibility in the hands of each aircraft squadron commander.²²

Success was declared during the summer of 1991 and the rest of the Air Force began a rapid-fire conversion. For example, the 86th Fighter Wing at Ramstein AB, Germany, quickly transitioned to the new organizational structure in May 1991.²³

The objective wing model will be applied to all operational wings across the Air Force. The commander billet will be upgraded from colonel to brigadier general, provided the wing has the required minimum number of personnel (at least 3,700).

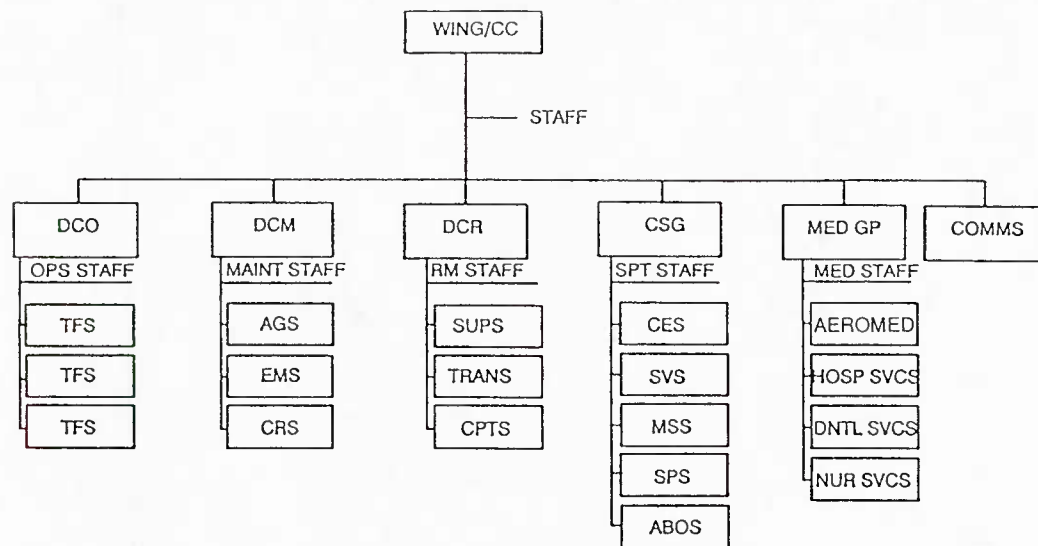
Part of the reason for establishing the objective wing is to eliminate duplication of command structures when more than one flying unit is located at one base. In the objective wing, all aircraft are assigned to the same wing commander. This wing commander will also be the base commander, a policy designed to bring all resources required for operations under the control of a single commander.

The reorganization is designed to streamline authority and responsibilities, and to produce more efficient operations while maintaining the flexibility to go to war as necessary, Air Force officials said. Among major changes in the reorganization is the elimination of the deputy commander concept.²⁴

Generic Model

The objective wing differs logistically from the traditional operational wing in that the flight-line maintenance that used to be assigned to the deputy

commander for maintenance will now be under the authority of the operational squadron commander.²⁵ Supply, transportation, and support maintenance will remain in the wing logistics group, which will also provide a deployable support group (figs. 5 and 6).



Legend :

AEROMED -- Aeromedical Evacuation System
 ABOS -- Air Base Operability Squadron
 AGS -- Aircraft Generation Squadron
 CES -- Civil Engineering Squadron
 COMMS -- Communications
 CPTS -- Comptroller Squadron
 CRS -- Component Repair Squadron
 CSG -- Combat Support Group
 DCM -- Deputy Commander for Maintenance
 DCO -- Deputy Commander for Operations
 DCR -- Deputy Commander for Resources
 DNTL SVCS -- Dental Services
 EMS -- Equipment Maintenance Squadron
 HOSP SVCS -- Hospital Services

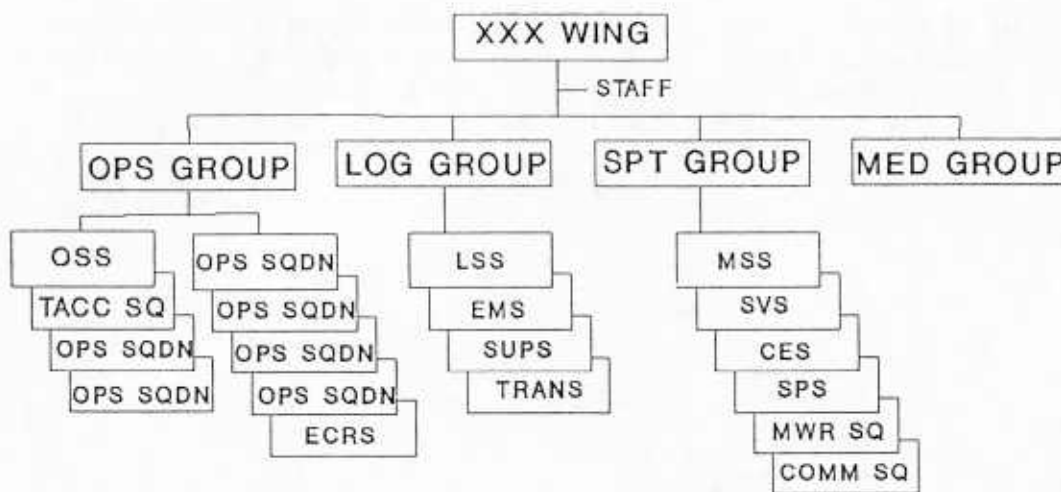
MAINT -- Maintenance
 MED -- Medical
 MED GP -- Medical Group
 MSS -- Mission Support System
 NUR SVCS -- Nursing Services
 OPS -- Operations
 RM -- Resource Management
 SPS -- Security Police Squadron
 SPT -- Support
 SUPS -- Supply Squadron
 SVS -- Secure Voice System
 TFS -- Tactical Fighter Squadron
 TRANS -- Transportation Squadron
 WING/CC -- Wing Commander

Figure 5. Traditional Wing Organization. The figure shows a standard Tactical Air Command wing organization prior to the objective wing format. The three principal functions for the wing were located under the tri-deputates for operations, maintenance, and resources.

An objective wing can be a homogeneous wing, a combined wing, or a composite wing, depending on mission(s) assigned and whether it has more than one type of aircraft. All of these wings will use the same objective wing model.

Homogeneous: The Traditional Approach

A homogeneous fighter wing typically consists of 3 squadrons of 24 aircraft each for a wing total of 72 primary authorized aircraft (PAA), all having the



Legend :

CES -- Civil Engineering Squadron
 COMM -- Communication
 ECRS -- Embedded Computer Resource Standards
 EMS -- Equipment Maintenance Squadron
 LOG -- Logistics
 LSS -- Logistics Support Station
 MED -- Medical
 MSS -- Mission Support System
 MWR -- Morale, Welfare, and Recreation
 OPS -- Operations

OSS -- Operations Support System
 SPS -- Security Police Squadron
 SPT -- Support
 SQ -- Squadron
 SQDN -- Squadron
 SUPS -- Supply Squadron
 SVS -- Secure Voice System
 TACC -- Tactical Air Control Center
 TRANS -- Transportation Squadron

Figure 6. Objective Wing Organization. The objective wing was established as a goal-oriented organizational structure. The structure exists as a model to be applied to operational organizations.

same configuration, along with trainer aircraft and back up aircraft inventory (BAI).²⁶ Presently, the average age of aircraft owned by the US Air Force is approximately 11 years. This average fluctuates with type of aircraft and the budget process, which should allow the continued purchase of replacement aircraft in order to maintain an acceptable level of aircraft age and to replace aircraft lost through attrition.

The present monolithic, wing-based organization of 72 aircraft all of the same type lacks flexibility because of its limited mission capability, and increases the time required to plan air operations by necessitating the assembly in advance of strike and associated support aircraft normally scattered among a number of widely separated bases.²⁷

While the homogeneous wing may lack flexibility, it makes sense from an economic and logistics point of view. It is obvious that the consolidation of like aircraft at one place simplifies aircraft maintenance and supply activities for the unit. The overall result is judged to be a least-cost alternative under peacetime economies. However, the operational trade-offs are a loss of cohesiveness, problems with command and control, weapons system vulnerability when a particular type of resource is located at one location only, and less than optimum combat effectiveness.²⁸

"We had to build up a composite force. We had to use a building-block approach" with special-purpose units under separate commanders, General Dugan explained. It had to be done that way because "we're still tied to our old logistics system," geared to supporting wings and squadrons of specialized, homogeneous aircraft, not wings composed of heterogeneous aircraft for a variety of purposes.²⁹

Combined: A Composite Wing of Convenience

Before the recent effort to move toward the use of composite wings, some bases contained a variety of aircraft assigned to separate commands in a number of traditional homogeneous wings. Various aircraft units at these bases were combined into single wings under the "one base, one wing" concept.

While the physical aspect of a multiple aircraft wing has the appearance of a composite wing, it is the planned use of the wing that creates the substantive difference.

A composite wing is a wing with multiple weapon systems operating and training from the same base and having a single wing commander. Some are built from the ground up and tailored for a specific task, for instance long-range intervention or support of the air land battle. Others result from basing decisions and organizing under the concept of a single wing for each installation. All promote more effectiveness in combat, better peacetime training, and efficiency of operation.

The above definition does not apply to situations where multiple MDSs [mission, design, and series] belonging to separate commands are located on an installation temporarily while rebasing actions are being planned/considered.³⁰

A number of wings that were not specifically designed to meet the needs of a composite force in a power projection role are already in existence. These are composite wings of convenience: multiple aircraft types are combined into single organizations, such as the 4th Wing at Seymour Johnson AFB, North Carolina, to reduce administrative overhead.

Seymour Johnson AFB Combined Wing Prototype

He (Gen [Merrill A.] McPeak) said the first place that type of wing (a composite) will be tested is Seymour Johnson AFB, N.C., where officials said the new 4th Wing was to be activated April 22 (1991).³¹

The 4th Wing at Seymour Johnson AFB evolved from the merging of two separate wings from two separate commands. The initial announcements claimed the new unit was to be a "composite wing." However, missions and roles for the 4th Wing are fundamentally two separate and distinct missions. This is not a composite force in the strictest application of the definition, and maybe could be better named a combined wing or even possibly a multi-mission wing.³²

A new wing merging tactical fighters and multi-mission aerial tankers was formed April 22, making the 4th Wing at Seymour Johnson AFB, N.C., an Air Force composite wing. The 4th Wing is made up of Strategic Air Command KC-10 tankers of the 68th Air Refueling Wing and Tactical Air Command F-15Es from the 4th Tactical Fighter Wing, both at Seymour Johnson AFB. The wing consists of three squadrons of F-15E fighters and two squadrons of KC-10 tankers.³³

The combined wing is a composite wing for convenience only—aircraft are not assigned to the wing as a result of a composite force tasking, but rather to save money by reducing duplication of effort. At the initiation of hostilities, the individual units could normally be expected to deploy to separate locations with separate (not composite) mission requirements. A real composite wing is formed as a result of a mission to train, deploy, and fight together. Because combined units were already supported at a single location (such as Seymour Johnson AFB), very few changes in the AFMC logistics support structure should be required.

Composite: The Premier Fighting Force

Why would you want to put a force together composed of different aircraft from different bases? The mutual support gained by coordinating the employment efforts of the differing assets exceeds that which can be achieved by assets conducting the missions autonomously.³⁴

General Dugan advocated composite wings as a means to increase war-fighting flexibility in the limited warfare arena. General McPeak continued the initiative and proposes a major restructuring of the force mix at the operational wing level. He believes this will provide the various aircraft needed to fight swiftly and efficiently.

The Air Force is now ready for different organizational schemes, and it is "busily looking at them," General Dugan declared. "At a time of great turbulence, there is an opportunity for us to look again at the way the Air Force is—at all the things we came to accept about the Air Force as lieutenants or captains or colonels." "One of those things," he said, is "our wing-based structure," which was devised in the past "to optimize our warfighting according to our logistics needs." Nowadays, those needs are much easier to fulfill, he continued, because contemporary combat aircraft have more hardware in common, hold up longer and better, and are easier to maintain.³⁵

The change from a generic wing having three squadrons of like aircraft to an organization comprised of a variety of combat aircraft in addition to such combat support aircraft as tankers, electronic warfare aircraft, reconnaissance planes, and possibly air transports will increase the complexity of operational wing logistics.

General Dugan, a key proponent of the composite wing, said that the service could dispense with "an awful lot of overhead" by including people who fly, fix and support the equipment at the same base.³⁶

Implementation of the composite wing organizations was foreshadowed by the establishment and apparent success of the 7440th Composite Wing (Provisional) at Incirlik AB, Turkey (Joint Task Force Proven Force), during the Iraq conflict. Implementation has now become a foregone conclusion.

According to General Dugan, top US Army commanders in Desert Shield would have preferred, at the outset, the support of something a little different—Air Force composite units with built-in versatility, each capable of carrying out such missions

as close air support, defensive counterair, and battle-area interdiction, among others, as necessary.

"The Army commanders saw great value in having a composite force from day one, one that could have done all the necessary jobs," General Dugan reported during the height of the buildup in August.

Even though the Air Force wound up fielding a composite force in the region, from the standpoint of the force's collective capabilities, its individual units were not integrated under a single commander, as they might have been.³⁷

The change to composite wings is not without its detractors, one of whom is retired Gen Alfred G. Hansen.³⁸ Most of the public debate centers on the perceived increase in cost, but some also doubt the advertised improvements in combat effectiveness.³⁹

Opponents of the concept say the construction and maintenance cost estimates prove that converting several wings to the composite organizational concept advocated by (General) McPeak would be impractical in an era of declining defense budgets.

McPeak, though, said he is convinced the operational benefits of allowing aircrews to train together on a regular basis in peacetime will outweigh the start-up costs and added maintenance burden associated with the new organizational concept.

According to McPeak, savings associated with the composite wing will occur over time, once the service moves to a two-level maintenance structure.⁴⁰

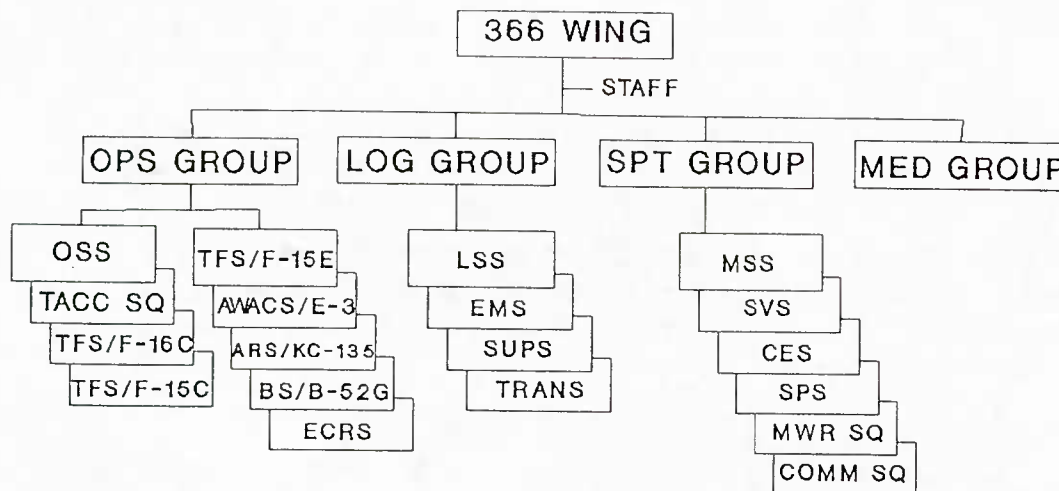
A composite wing operates multiple weapon systems from the same base under a single wing commander (fig. 7). The concept is advertised as teamwork to provide increased combat effectiveness by living, working, planning, training, deploying, fighting, and playing together as a wing.⁴¹

Under the composite wing proposal, air wings would be created that reflect the mix of aircraft required to fight as an integrated unit. The composite wings would include most elements required to mount operations under one commander, stationed at one base, much like a Navy carrier air wing. The actual composition of the wings would vary depending on their specific missions.⁴²

The inherent capabilities that exist in a composite wing prepare it to satisfy an elite role as the Air Force's first response force. The composite wing has evolved to become the best place to be assigned—that is where the action will be. The background rationale is provided in one of the opening paragraphs of the draft concept of operations prepared by Air Combat Command.

The concept of "Global Reach—Global Power" is a philosophical framework that recognizes there will be fewer forward based forces. This philosophy has challenged the Air Force to reevaluate the way it organizes and trains forces to effectively and rapidly project air power anywhere in the world from CONUS garrison locations. Typically, aircraft from various stateside bases are brought together in a theater of operations to perform an array of missions in support of specific national and military objectives. Recent history has demonstrated that this process takes excessive time, coordination, and support assets. Economy of force, the need for unity of command, and the requirement to expedite mission planning and execution, dictate that the Air Force develop and implement this new concept of operations.⁴³

MOUNTAIN HOME AFB, IDAHO



Legend :

ARS -- Air Refueling Squadron
 AWACS -- Airborne Warning and Control Center
 BS -- Bomb Squadron
 CES -- Civil Engineering Squadron
 COMM -- Communication
 ECRS -- Embedded Computer Resource Standards
 EMS -- Equipment Maintenance Squadron
 LOG -- Logistics
 LSS -- Logistics Support Station
 MED -- Medical
 MSS -- Mission Support System

MWR -- Morale, Welfare, and Recreation
 OPS -- Operations
 OSS -- Operations Support System
 SPS -- Security Police Squadron
 SPT -- Support
 SQ -- Squadron
 SUPS -- Supply Squadron
 SVS -- Secure Voice System
 TACC -- Tactical Air Control Center
 TFS -- Tactical Fighter Squadron
 TRANS -- Transportation Squadron

Figure 7. Composite Wing Organization. The 366th Wing will be structured as shown. The B-52 squadron and the E-3 AWACS operational squadrons are shown as a part of the wing; in fact, these squadrons will operate as geographically separated units from the main wing organization.

Summary

Composite wings are only one facet of a radically changing world. The relationship between the implementation of composite wings and the logistics support of those wings is affected as much by the peripheral events as by the main attraction.

Several rapid and simultaneous events have created a unique situation for the embodiment of the concept of the composite wing. The significant events include the secretary of the Air Force white paper on *Global Reach—Global Power*, which is a milestone in the ability of senior Air Force leadership to project the future role of air power. They also include a major military conflict in the Middle East, the collapse of the Soviet Union, and the dissipation of the Warsaw Pact as a military adversary.

Left without a well-defined threat from an easily recognizable enemy, the DOD is struggling against a weak economic environment that demands serious reductions in the size of the standing military force. As military forces are brought back to the US and reduced, the organization of the remaining force structure requires a different look if we are to maintain the same relevant combat capability we previously enjoyed. Now, the US Air Force must be able to project combat capability from the homeland to distant trouble spots to meet national security needs. The result of recognizing the importance of mobility to air power is also a clear recognition of the need for a logistics lifeline.

Mobility is the key. This is why logistical considerations are of paramount importance in Air Force planning for leaner, more flexible forces, whatever they may be called. The Air Force is bent on "going lighter" in overseas deployments—cutting back on creature comforts and carrying the bare minimum of spares, stores, and the stuff of everyday living.⁴⁴

Logistics remains a necessity. The question is how are we to minimize the logistics "footprint" in deployment situations.

The objective wing overshadows the subtypes of wings, such as the traditional homogeneous, the combined, and the composite, each of which has useful and distinct purposes. The composite wing uses the objective wing format, but has more than one aircraft type assigned. The composite wing is specifically designed to provide the initial combat capability that may be required anywhere in the world. Chapter 3 will discuss a possible concept of operations for a composite wing and the logistics support concept that will be needed.

Notes

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4. James W. Canan, "Back to the Future," *Air Force Magazine*, October 1990, 32.
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6. Canan, 35.
7. Brig Gen Henry P. Viccellio, USAF, "Composite Air Strike Force," *Air University Review* 9, no. 1 (Winter 1956–1957): 28.
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13. AFLC Pamphlet, "Air Force Logistics Command—Logistics Management System," 29 October 1990, 85.
14. Briefing, Lt Gen Robert McCoy to AFLC staff, subject: Air Logistics Center Reorganization, April 1990.
15. Larry Grossman, "Base Force," *Government Executive*, May 1992, 10. This was a quote used from "the new 1992 National Military Strategy which codifies the strategy outlined in the Base Force Plan."
16. Barbara Opall, "AF Sees 21-Wing Combat Force by '96," *Defense News*, 20 January 1992, 8.
17. Barbara Opall, "Air Force to Restructure Tactical Forces," *Defense News*, 14 January 1991, 3.
18. Department of the Air Force, *Air Force Restructure*.
19. *Ibid.*, 3.
20. *Ibid.* The *Air Force Restructure* white paper also includes the following organizational changes: Restructuring of HQ AF; AFLC-AFSC merger; AF Intelligence Command established; Air Force Communications Command to become a Field Operating Agency; PACAF/USAFE to own aircraft resources; established Air Combat Command (ACC) and Air Mobility Command (AMC); Numbered Air Force changes and deletion of air divisions; set up of objective wings; discussion of operations group, logistics group, and support.
21. "Moody AFB to Test New Streamlining," *Air Force Times*, 20 May 1991, 4.
22. *Ibid.*
23. Lt Col P. J. Callahan, USAF, "Single Wing Organization," background paper for USAFE/XPM, 26 March 1991, 1.
24. Air Force News Service, "F-15E + KC-10 = Composite Wing," *Skywrighter*, 3 May 1991, 8. In this article, the reporter acknowledges that 40–50 mostly military positions were eliminated because of the merger. These manpower savings were attributed to the consolidation effort at Seymour Johnson AFB, North Carolina, only. Not all wing consolidations will have the same results.
25. The objective wing structure will vary with application to the various major commands. While this report principally focuses on the structure to be used by the Air Combat Command, the reader should note that the Air Mobility Command structure will be different.
26. "Air Force to Create Two New Composite Air Wings by 1993," *Aviation Week & Space Technology*, 14 January 1991, 26.
27. Jeffrey Record, "AF's Future Bright after Stellar Gulf Showing," *Air Force Times*, 11 March 1991, 34.
28. "Air Force to Create Two New Composite Air Wings by 1993," 26; and Opall, "Air Force to Restructure Tactical Forces," 3.
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30. AF/MOO Staff Summary Sheet, "Definition of Composite Wing," 26 March 1992.
31. Julie Bird, "McPeak Lays Out Rationale for Composite Wing," *Air Force Times*, 29 April 1991, 4.
32. Memorandum, Douglas M. Fraser for Gen Merrill A. McPeak, subject: Confusion about Composite Wings, 19 April 1991.
33. Air Force News Service, *Skywrighter*, 8.
34. Lt Col James P. Kelly, USAF, "Composite Force: Reflections on Red Flag," *USAF Fighter Weapons Review* 33, no. 2 (Summer 1985): 3.
35. Canan, 35.
36. Opall, "Air Force to Restructure Tactical Forces," 3.
37. Canan, 34–35. This quote addresses the desires of the Army commanders working with the Air Force to have a single commander in charge of all air assets. Indeed, the joint force air component commander (JFACC) establishes that role. The quote goes beyond the JFACC and attempts to establish a singularity of command within the wing structure where a number of aircraft assets are assigned.
38. Opall, "Air Force to Restructure Tactical Forces," 3.

39. For the reader interested in further insight into the debate on composite wing costs, a paper written in 1991 by Mr C. Fred McNitt, HQ MAC/FMCC, titled "Composite Wing Force Structure: Considerations in Estimating the Costs," may be of interest. It was presented to the 25th Annual DOD Cost Analysis Symposium, O/S Cost Analysis I Workshop. The paper describes the considerations for estimating the costs of a composite wing.

40. Barbara Opall, "TAC Officials Say Composite Wing Proposal is Prohibitively Expensive," *Defense News*, 17 June 1991, 12.

41. Briefing, TAC/XP, subject: Composite Wings, October 1991, chart no. 2.

42. "Air Force to Create Two New Composite Air Wings by 1993," 26.

43. Headquarters TAC/XPJ, "TAC Concept of Operations for the 366th Wing (Mountain Home AFB)," draft, 18 November 1991, 1. This same quote also appears in the HQ ACC/XPJ concept of operations for the 23d Wing at Pope AFB, 11 May 1992.

44. Canan, 36.

Chapter 3

The Implementation Plan

A Composite Air Strike Force can be used in any of several ways. It provides a trained, equipped, and ready force, part or all of which may be rapidly dispatched to virtually any area of the world that has the facilities to support it.

—Brig Gen Henry P. Viccellio, 1956

The previous chapter provided the basis for the composite wing organization. This chapter explains how the composite wing will function. It is presented as the author's best estimate of the composite wing concept of operations and the composite wing logistics support concept. At the time of this writing, the concept of operations for the employment of the composite wings was in draft form at Air Combat Command (ACC) headquarters. A concept of operations is needed for the reader to understand how the composite wing will operate. This chapter attempts to fill that need.

In any formulation of a logistics support plan, the planner must first understand the Air Force and major command concepts of operations. The logistics planner needs to recognize the distinctive advantages of a composite wing in order to align the support structure to emphasize and accentuate those operational advantages. The composite wing concept of operations for the two prototype composite wings, and the resulting logistics support concept, are discussed here.

Concept of Operations

"The idea will be that (composite wings are) optimized to reach out over long distances and take immediate action where integrated action of that type is needed."¹ General McPeak's comment can also be applied to the way the Composite Air Strike Force was employed in the 1950s. The key difference is that the units assigned to the Composite Air Strike Force were not necessarily stationed together during their peacetime basing. Peacetime training as a composite force was either simulated or conducted during exercises.

The composite wing philosophy is to "operate multiple weapon systems from the same base under a single wing commander."² This philosophy underscores and facilitates the concept of "train like you're going to fight."³ The biggest advantage for the composite wing will be the simplicity of the operation in the

employment phase. As presented by one researcher, Dr Donald M. LeVine, "The revolution inherent in the composite air wing lies in the conception, planning, and organization of air power, not in the details of its execution."⁴

Special operations units are already organized as composite forces, and they have trained and fought together as a team. The methods and organizational style of the special operations missions are now being selectively applied to the general purpose forces.

The Threat

The relative strengths of friendly forces are declining in comparison to opposition forces.⁵ While the US and many allies are cutting back on defense forces, many third world countries are increasing their purchases of arms in an attempt to improve their military equipment inventories. The next adversary is not expected to be technologically superior to the US, but the enemy may have the advantages of surprise and location.

A threat to US interests can arise at any time. The US Air Force must be prepared to confront a foe from any number of possible sources. The secretary of defense published a list of seven possible conflict areas in the 1992 *Defense Guidance*. While Congress and the press portrayed the scenarios as unreal, unlikely, or just impractical, the point remains that the military services used the *Defense Guidance* to postulate required future force structures against possible military actions. The names and locations may be different, but the threat of a future conflict remains a reality.

The location is not predictable, but the conflict is expected to be a regional one, external to the US. The confrontation will be politically motivated. It may initially be a low-intensity conflict and then escalate to the scale of a conventional war (e.g., the Persian Gulf War). The time allowed for US national response will be less than 48 hours.⁶ Gen Colin Powell, chairman of the Joint Chiefs of Staff, testified to a Senate defense panel that "The real threat we now face is the threat of the unknown, the uncertain."⁷ Figure 8 illustrates possible US military responses and their probabilities.

A Checkmate report published in late 1990 discussed the use of composite wings against the background of three scenarios.⁸ The first situation involved a major regional conflict with a short warning time. The second related to the actions of a nation-state that threatened US national interests to the degree that required US projection of power until political objectives were met. The last scenario postulated the use of US ground forces airlifted/airdropped into a third world country to protect a threatened friendly government.

Operational Characteristics of a Composite Wing

The unique challenge to a (composite) wing is the ability to operate as an entity—possibly an autonomous entity—and to win/fly/fight.⁹

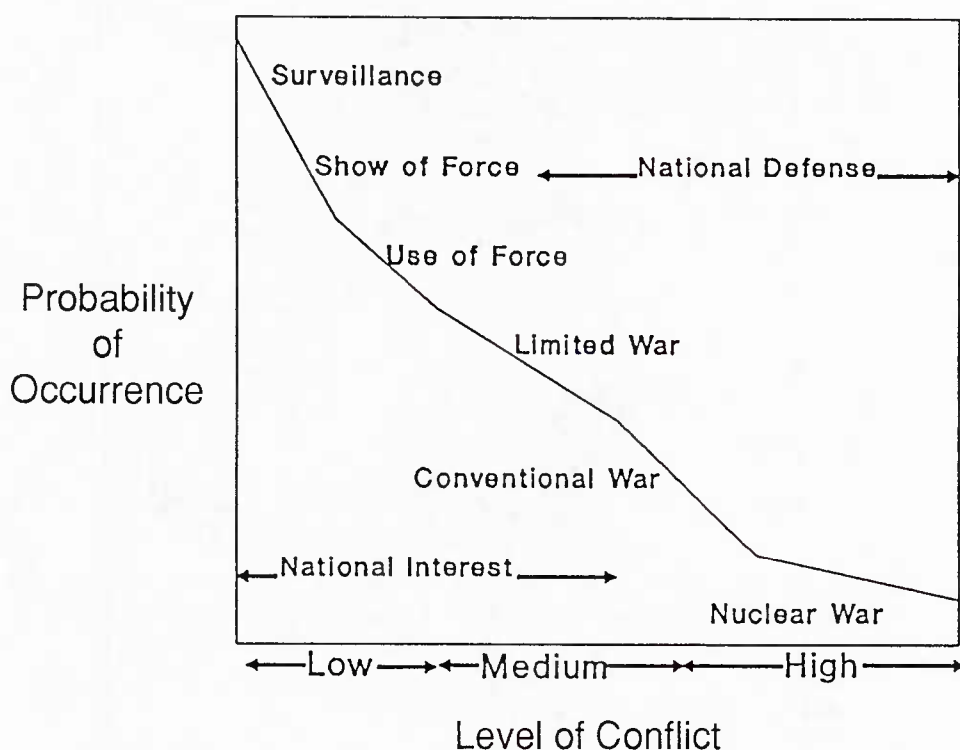


Figure 8. Future World: US Military Roles/Response

To counter the potential threat, the Air Force is putting together composite wings as a first-line response force capable of responding rapidly to a wide variety of threats that may come from anywhere in the world. Three characteristics are operationally important—speed, range, and flexibility.¹⁰

Speed. The composite wing will have the ability to respond rapidly, as the initial fighting force, to regional threats throughout the world.¹¹ This capability requires the composite wing to maintain a high degree of readiness.

Range. The Persian Gulf War and such exercises as Bright Star have already shown the ability of the B-52 force to launch from US bases to put weapons on targets as far away as the Middle East. All other aircraft assigned to a composite wing have a built-in capability for air-to-air refueling, thus assuring a similar global reach within a matter of hours. Range capability will be even more important as the availability of overseas air bases starts to decline dramatically (fig. 9).

Flexibility. The composite wing will have the flexibility to respond in a highly coordinated fashion to a variety of threats across the spectrum of conflict. Most of the principal weapon systems required for initial operations will exist within the unit. This flexibility is dependent not only on the unit's ability to initially assign a variety of aircraft to the threat but also on the ability of the unit to adapt to changing mission requirements with various weapon system types and various mixes of aircraft. In providing greater



Figure 9. E-3 Airborne Warning and Control System (AWACS) In-Flight Refueling. Both AWACS and KC-135R tanker aircraft will be assigned to the 366th Wing. The air refueling capability provides long range and endurance necessary to support continuous flight operations.

flexibility, the composite wing will necessarily dilute the benefits of weapon system centralization and specialization in trade for the ability to respond rapidly to a wider variety of scenarios.

The composite wing will have fewer numbers of each type of resource. With the proposed composite wing force structure, it will lack some of the essential ingredients of a truly representative composite force. The aircraft types included will consist of aircraft that can be put together in a composite wing but will not include all of the types of aircraft that are available for use in a combat situation as a composite force. Some examples of excluded weapon systems are the B-2 in a conventional role; strategic airlift such as the C-141 and C-5; electronic warfare systems such as the EC-130H (Compass Call), EC-130E (ABCCC), EC-135, and EF-111; and other systems like the F-117A, KC-10, TR-1A, U-2R, and special operations-designated aircraft. With speed, range, and flexibility, the composite wing will provide a capable foundation for meeting most Air Force roles and missions.

Roles and Missions for a Composite Wing

Based on the Joint Strategic Capabilities Plan (JSCP) and the War and Mobilization Plan (WMP), the force break-out structure consists of three distinct types of forces: in place, single theater, and swing.¹²

In-place forces are those positioned in areas of high-threat potential and expected to provide a fight-in-place capability. There is no mobility requirement, but the forces may be augmented by other assigned forces that are not designated as in-place forces.

A single-theater force is one that typically will be located in the US or near the area of expected operations with a requirement for a deployment to move into action when directed. The single-theater force is apportioned to one theater only, such as Pacific Command, European Command, or Central Command.

Swing forces can be tasked to support more than one commander in chief (CINC) in either a "first" or "second" contingency. The composite wings that are being developed to operate from the US will be allocated as swing forces having the ability to operate autonomously in almost any environment. Typically, a major regional area is assigned for each of the combatant aircraft wings. The assignment may be more generic for the composite wing due to its status as the initial contingent for all regional conflicts regardless of the region.

While specific details of the plan are still being worked out, the Air Force proposes to create two prototype composite air wings. One would be devoted to supporting and working in conjunction with ground forces. The other would be geared for rapid deployment and would include aircraft that could perform attack, defensive, stand-off jamming and precision-strike missions.¹³

Composite wings will be assigned one of two general principal roles with overlapping capabilities: the role of aerospace control or the role of force application. The roles of force enhancement and force support will be embedded in each of the composite wings. The actual use of the composite wing and its multirole aircraft may allow for an overlap of different roles and missions for the composite wing.

Aerospace Control—Air Intervention Wing. The aerospace control role includes such missions as offensive counterair (OCA), suppression of enemy air defenses (SEAD), and defensive counterair (DCA).¹⁴ To accomplish the missions of aerospace control, an air intervention wing was established. The purpose of this type of composite wing is to "assure friendly use of the environment while denying its use to an enemy."¹⁵

Deployment and employment of a composite wing will be dependent on the situation and contingency presented. In most cases, however, the initial posture will be defensive, and priority will be given to establishing aerospace control.¹⁶ The second priority, and in some cases a parallel overlapping action, will be force application.

Force Application—Battlefield Attack Wing. The force application role includes the missions of strategic attack, interdiction, and close air support.¹⁷ To meet the demands of the force application role, a battlefield attack wing was established. The purpose of this type of wing is to "bring aerospace power to bear directly against surface targets."¹⁸

Force Enhancement and Force Support. Both the air intervention wing and the battlefield attack wing will have elements of the force enhancement (airlift, air refueling, electronic combat, surveillance and reconnaissance) and force support (base operability and defense, logistics, and combat support) roles.¹⁹ "Force enhancement increases the ability of aerospace and surface forces to perform their missions."²⁰ "Force support must sustain

operations if aerospace forces are to be successful.”²¹ Many of the roles and missions of force enhancement and force support will not be available as part of the assigned forces for the composite wing. Therefore, the planner should expect force augmentation from a variety of sources for the actual implementation of a deployed composite wing force. As established through the first two prototypes, the composite wings will not contain all the needed assets to conduct all of their tasked operations.

Composite Wing Operations

The activities of a composite wing are principally the same as any other combat wing. Functions include planning, organizing, equipping, training, deploying, defending, attacking, prevailing, redeploying, and reconstituting (fig. 10).

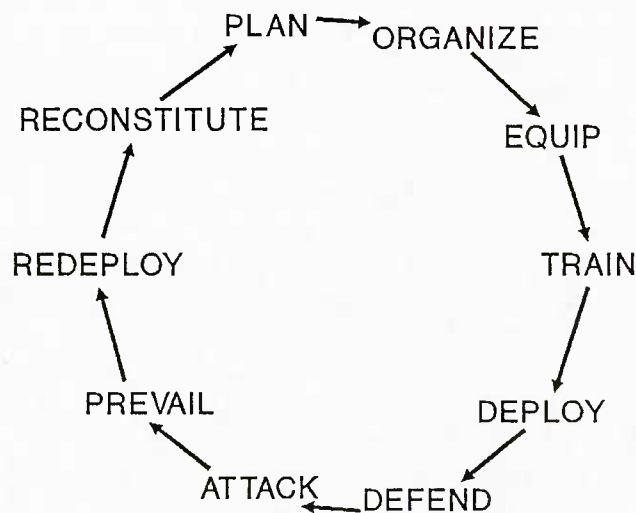


Figure 10. Concept of Operations Life Cycle

Plan. During periods of peacetime, the composite wing staff will maintain updated plans for the current most likely contingencies.²² Tasking will be received as mission-type orders with detailed operational planning and coordination accomplished within the wing.^{23,24} The planning process includes the use of intelligence sources to measure the threat and the use of available composite wing resources to select targets and devise a proposed response. Coordination with external wings/allied forces will be required. Wing capabilities will include air tasking order (ATO) generation, airspace control, target analysis/intelligence estimate, mission planning, and bomb damage assessment (BDA).²⁵ Logistics will be an important consideration in all these activities.

Logistics sets the campaign's operational limits. The lead time needed to arrange logistics support and resolve logistics concerns requires continuous integration of logistic considerations into the operational planning process. This is especially critical when available planning time is short.²⁶

Organize. This is the process of constructing the unit to execute the plan. The squadron unit will remain as the basic building block of a fighting force; however, the size and composition of a squadron are flexible. The command structure will be based on the same structure used for all objective wings.

Equip. Included in this activity is the provision of weapon systems and support equipment, and the personnel to operate and maintain them. The composite wing will require the communications necessary to support internal and external needs, to stand alone, or to plug into a full spectrum of existing infrastructures.²⁷ Another strong consideration will be possible augmentation by Reserve and Air National Guard units, which will need to maintain a readiness level that allows a full combat-ready status within warning times.²⁸ Active forces will be used for the initial threat response while the Reserves/Guard will be used for follow-on actions.²⁹

Train. The composite force will require the training to sustain 24-hour operations.^{30,31} The requirements will be met by practicing individually and then as a composite force to execute the plan. It will be easier to facilitate the composite force training in a composite wing because all of the resources are available.

When composite wings are formed, they should be manned primarily by experienced people, [Brig Gen Lee] Downer said. "I would like to have a wing that didn't have a big training commitment," he said.

"You've got to have some rookies, but not nearly as many as you might have in a typical wing. The emphasis would not be on training, but on sustaining."³²

Deploy. This entails getting the right weapon systems, munitions, support equipment, and people into the theater. The mission may be a show of force, a single strike, or a sustained effort.³³ Once directed to take action, the job of the composite wing will be to get to the theater of operations quickly with a credible combat force.

The support package for each situation will be unique. The combat air wing must be careful to take only what is not available at the destination. Otherwise, it runs the risk of becoming too heavy and immobile.³⁴

The wing should initially deploy with an absolute minimum amount of equipment, relying on gaining entry to an area of operations that can support a defensible resupply capability quickly.³⁵ Logistics systems must be able to support rapidly deploying units anywhere in the world.³⁶

The composite wing should employ tailored unit type codes (UTC) to avoid having to take the entire wing when only a portion of its capability is needed. The composite wing/unit employed should only take the parts of the wing that are needed for the mission at hand.³⁷

Unit integrity is fundamental for proper application of the composite wing. People who have worked together should deploy together. Neither people nor equipment should be sourced to make up "rainbow units."³⁸

If the situation allows, the composite wing should have advance teams (such as maintenance) in place before its aircraft arrive in-theater.³⁹ But the composite wing may function as the principal capability for forced entry into a

theater of operations, and it will then be necessary to establish and maintain the necessary air bases. The composite wing can also serve as the joint task force (JTF) or the lead air component element for a follow-on larger force.⁴⁰ The wing's command, control, communications, and intelligence (C³I) system will be capable of executing mission-type orders from National Command Authorities, CINC, and the joint force commander (JFC).⁴¹

We need to better plan for forced entry operations and deployability of our forces. These areas need a lot of work. TAC, TRADOC, and MAC need to develop forced entry doctrine, tactics, techniques and procedures.⁴²

Defend. Typically, the initial use of a composite wing will be in a defensive posture to contain and suspend enemy aggression. The air intervention wing will focus on contesting enemy air superiority and will function as the lead unit in the theater of operations to facilitate entry into the theater by follow-on forces. The composite wing will be capable of autonomous, self-sustained, 24-hour conventional operations for up to seven days in areas where enemy air defenses are limited.⁴³

Attack. Defensive actions alone will not capture air superiority. Once a powerful enough combat force exists in the theater, the composite wing will swing to offensive actions with the primary purpose of achieving air superiority and supporting the joint task force commander.

Prevail. The composite wing will have the ability to sustain combat operations and continue with unrelenting force until air campaign goals are achieved.

Redeploy. The composite wing will be able to recover forces, clean up, and return home or deploy to another theater.

Reconstitute. After returning from the theater, the composite wing will reconstruct the force. It will modify its organization, tactics, and equipment based on lessons learned.

The principal characteristic of a composite wing is the ability to quickly move a composite combat force into an area of operations. Past deployments of geographically separated units into a region have required massive coordination and familiarization training. For that reason, the composite wing will reside in and operate from one location during peacetime.

For planning purposes, consider that there may be as many as four composite wings, defined as either air intervention wings or battlefield attack wings. There may be two air intervention wings and two battlefield attack wings or three air intervention wings and one battlefield attack wing. The composite wing at Pope AFB, North Carolina, will operate with the XVIII Airborne Corps. Recently, discussions have started for the possible establishment of a third composite wing—based on the 347th Fighter Wing at Moody AFB, Georgia—using A-10 and F-16 aircraft for battlefield attack (fig. 11).

During the operational employment phase, bare-base operations are expected to be the norm.⁴⁴ The composite wing should strive to maintain unit



Figure 11. Composite Wing and Air Logistics Center Locations. A third composite wing, to be located at Moody AFB, Georgia (not shown), is also under consideration.

integrity by basing all composite wing aircraft at a single air base in the theater, but it may not always be possible to do so.⁴⁵ If the composite wing force must be split, the fighters will be staged from forward locations while heavy aircraft will be based toward the rear. The deployment basing plan needs to be flexible enough to accommodate a split composite wing operation.

366th Wing—Mountain Home AFB, Idaho. In the draft concept of operations, the 366th Wing is to be home based at Mountain Home AFB as an Air Combat Command unit under the Twelfth Air Force. The 366th Wing mission will be to “rapidly deploy a highly trained composite force, and successfully plan and execute autonomous air operations in any theater, region, or contingency area in support of US/allied national and/or military objectives.”⁴⁶

Previously, Mountain Home AFB was used for basing a wing of F-111 aircraft under the 366th Tactical Fighter Wing.⁴⁷ With the release of the F-111 aircraft from service, and given the readily available training airspace in and around the Mountain Home area, the 366th Wing was selected as the first composite wing prototype.

The composite wing proposed for Mountain Home AFB, Idaho, will be designed for special contingencies like the 1986 bombing raid on Libya, Air Force Chief of Staff Gen. Merrill A. “Tony” McPeak said.⁴⁸

This composite wing will be optimized as an air intervention wing to achieve and maintain air superiority. The 366th Wing is expected to be tasked with the following types of primary missions:⁴⁹

- Offensive counterair
- Defensive counterair
- Suppression of enemy air defenses
- Air interdiction (day/night)
- Strategic aerospace offense

It also will be tasked with the following force enhancement missions:

- Airborne surveillance, command, and control
- Reconnaissance, using assets from the Air National Guard
- Electronic warfare, using EF-111s gained from the 27th TFW
- Air-to-air refueling

The 366th Wing may be required to deploy and operate up to seven days without resupply, and may be tasked to operate from bare-base locations.⁵⁰ The draft concept of operations allows for the potential use of multiple bases during the deployment, but this is not considered an optimum employment of composite force capabilities. By 1994 the proposed 366th Wing should include several types of weapon systems (figs. 12, 13, 14, and 15).⁵¹

- 65 "shooter" aircraft: 18 F-15C/D Eagle
12 F-15E Strike Eagle
28 F-16C/D Fighting Falcon
7 B-52G/H Stratofortress⁵²
- 9 support aircraft: 3 E-3B/C Sentry AWACS⁵³
6 KC-135R Tanker

The assumption is that there will be a separate homogeneous squadron for each aircraft type. For example, the F-15C and the F-15E would be in



Figure 12. F-15E Strike Eagle Aircraft. Both F-15C and F-15E aircraft will be assigned to the 366th Wing, but will be operated and maintained under separate squadrons.



Figure 13. F-16C Fighting Falcon Aircraft. The F-16C will provide a swing-role capability and will be assigned to the 366th Wing.

separate squadrons within the composite wing.⁵⁴ The squadron size will usually be smaller than squadrons within wings that are assigned only one aircraft type.

23d Wing—Pope AFB, North Carolina. Historically, Pope AFB has conducted operations with the Army units assigned to Fort Bragg, North



Figure 14. E-3 Sentry Aircraft. The E-3 AWACS will be assigned to the 366th Wing to provide surveillance/command and control. At least initially, the AWACS aircraft will operate from a geographically separated unit stationed at Tinker AFB, Oklahoma.



Figure 15. B-52G Stratofortress Aircraft. The long-range B-52 will allow for immediate conventional bombing strikes worldwide from bases located within the continental United States. The B-52G will operate from a geographically separated unit until replaced in the future by the B-52H model.

Carolina. The Pope wing was previously a homogeneous wing of C-130 aircraft used for the airlift of Army troops.⁵⁵

This composite wing will be optimized as a battlefield attack wing operating in the AirLand Battle role with the XVIII Airborne Corps/82d Airborne Division at Fort Bragg.⁵⁶ If the XVIII Airborne Corps goes to war, the 23d Wing will go with it.⁵⁷ The 23d mission will be to “rapidly deploy a highly trained composite force and successfully plan and execute air operations . . . in any theater, region, or contingency area as part of any force, joint or allied, in support of national and/or military objectives.”⁵⁸

The 23d Wing will operate in areas where enemy air- and ground-based defenses are limited. It may be tasked in part or totally, and it will be augmented if the air threat or target base dictates.⁵⁹ The 23d Wing is expected to be tasked with the following types of primary missions:

- Strategic attack
- Interdiction
- Close air support
- Special operations

It may also be tasked with the following force enhancement mission:

- Intra-theater airlift⁶⁰

Planning for the 23d Wing calls for at least a three-to-five day supply of preferred munitions.⁶¹ By 1994, the 23d Wing should include the several types of weapon systems (figs. 16, 17, 18, 19, and 20).

- 36 “shooter” aircraft: 18 A-10 Thunderbolt II
6 OA-10 Thunderbolt II
12 F/A-16 Fighting Falcon
- 6+ support aircraft: 6 C-130H Hercules
? EC-130 ABCCC
? E-8 JSTARS⁶²



Figure 16. A-10 Thunderbolt II Aircraft. The A-10 and the OA-10 aircraft will be assigned to the 23d Wing at Pope AFB, North Carolina.



Figure 17. Flight of F-16C Aircraft. The F-16C Fighting Falcon aircraft will be assigned to the 23d Wing in a swing-role capacity.



Figure 18. AC-130 Gunship. The AC-130 may be used to augment the 23d Wing. Presently, there are no plans for AC-130 aircraft at Pope AFB.

With a drawdown of forces from 34 to 26.5 combat wings, possibly as few as 21, and an inability to form all wings into composite forces, the actual number of composite wings may be only three or four. There is speculation that the 343d Composite Wing may be formed at Eielson AFB, Alaska, and Headquarters ACC/XPJ has prepared an initial draft concept of operations for a composite wing to be formed at Moody AFB, Georgia. Those that are formed will be true composite wings with formally assigned composite force missions.⁶³

One study indicated that there may be two composite wings within the United States and others outside the US—Europe- and Pacific-based versions.⁶⁴

The Air Force will develop more composite wings overseas at forward locations than in the continental United States because overseas wings tend to fight from where they are based, while CONUS bases do not. CONUS units that fill in overseas can remain in single aircraft wings.⁶⁵

Logistics Support Concept

Combat support exists to meet operations needs. Without this support, combat operations are impossible. In the broadest sense, combat support is the art and science of creating and sustaining combat capability.⁶⁶

The goal of logistics support is to provide for combat readiness and sustainability. The best situation is one in which no logistics support is required—therefore, the logistics goal for composite wings will be to acquire and use self-supporting equipment.⁶⁷ The primary goal of logistics support should be increased aircraft availability. In the past, the average aircraft availability



Figure 19. C-130 Hercules Loading Airborne Troops. The C-130 aircraft assigned to the 23d Wing at Pope AFB will continue to support the 82d Airborne Division at nearby Fort Bragg, North Carolina.

goal for fighter aircraft has varied from 80 to 90 percent. The composite wing, with a lack of depth in aircraft resources and an increased operational mission requirement, should have an aircraft availability goal in excess of 90 percent.

Supply

Logistics priority for the composite wing should parallel the operational readiness requirements for which it is tasked. Continuing the original assumption of this study (that the composite wing is the Air Force's premier response capability), the composite wing should have a high force activity designator (FAD) for deriving supply and distribution priority codes as well as maintenance priorities.⁶⁸

The current operational priority matrix for supply is based on the theater being deployed to and then on one of three deployment categories: in-place fighting force, deterrent force, or war-fighter force. The Air Force is implementing a new priority matrix based on operational tasking, with the



Figure 20. C-130 Aircraft Loading M1A2 Tank. With the collocation of the 23d Wing and the 82d Airborne Division, the capability to quickly move a fighting force with ground troops will be enhanced.

highest priority allocated to in-place forces. Then come triple swing forces assigned against the first contingency, double swing forces to first contingency, theater only forces, triple swing forces to second contingency, and double swing forces to second contingency. A major regional area will be given priority over a lesser regional area.⁶⁹

A composite wing will have fewer of each aircraft type than a homogeneous wing. This will drive a requirement for higher aircraft availability goals and/or an increase in the size of the assigned readiness spares kit (RSK).

The aircraft availability goal is used in conjunction with the number of aircraft assigned to determine the number of spares required in the RSK. The combination of aircraft availability goal and aircraft assigned gives an indication of potential opportunities for cannibalization during a deployment. Cannibalization opportunities increase as the number of same-type aircraft increases. At the same time, the requirement for peacetime operating stocks and RSK will decrease.⁷⁰ Another point is that, in addition to grounding cannibalized aircraft, using aircraft cannibalization to support mission requirements runs the risk that serviceable equipment removed from cannibalized aircraft may be damaged in the process.

Readiness spares kits and initial spares support lists (ISSL) for composite wings are principally satisfied with spares and support equipment from the sourced units. Based on the initial site activation task force (SATAF) planning, any additional requirements are being satisfied through excess assets made available from the reduction of forces.⁷¹ Assigned RSKs will be fragmented into smaller and independent seven-day RSKs which can then be

augmented with a follow-on and larger 23-day RSK segments. This provides the traditional 30-day RSK capability and reduces the initial airlift required.⁷²

Maintenance

A "rule of war" which has long been expressed says there is a point in the line of communication behind which the maintenance of forces is relatively simple and straightforward. Ahead of that point, though, the maintenance of forces becomes quite difficult and complex with the threats and tautness of combat. Because of this, logic would seem to dictate we should not advance an organization, a piece of equipment, or a person, ahead of the magic point in the line of communication unless that organization, piece of equipment, or person is absolutely essential to the operations underway.⁷³

The overall plan is to rely on the two levels of maintenance concept as much as possible, using the repair activities designated in the SATAF planning (table 2).

Table 2
366th Wing Maintenance Concept

<i>Aircraft</i>	<i>On-Base Repair</i>	<i>Off-Base Repair</i>
F-16C		
Engines	X	
Avionics		X
LANTIRN*	X	
F-15C/E		
Engines	X	
Avionics	X	
LANTIRN*	X	
E-3B/C		
Engines		X
Avionics		X
KC-135R		
Engines		X
Avionics		X
B-52G		
Engines		X
Avionics		X

*LANTIRN—Low-Altitude Navigation and Targeting Infrared for Night.

Air Force Regulation (AFR) 66-14, *The US Air Force Equipment Maintenance Program*, defines two levels of maintenance:

- Level 1—Organizational (now called Base-Level Maintenance). On-off equipment repair to include remove, repair, reinstall, and replace actions performed by an operational unit to support its own requirements.
- Level 2—Supporting (now called Depot-Level Maintenance). All maintenance activities other than those categorized as organizational.

Off-base repair actions will be accomplished for all heavy aircraft engines and avionics, F-16 avionics (except electronic countermeasures systems and LANTIRN), and F-16 hydrazine at or from Nellis AFB, Nevada.⁷⁴

F-16 avionics will be repaired at a depot or regional repair facility. While two levels of maintenance will reduce the requirement for transporting F-16 intermediate-level maintenance test equipment, the trade-off would normally be an increase in the F-16 readiness spares kit.⁷⁵ However, the ground rules for F-16 two-level maintenance requires that the number of depot-level reparables will not increase. Therefore, the actual deployment of systems that will require an intermediate level of maintenance should be delayed as long as practical.⁷⁶

In the future, the composite wing will attempt to reduce the variety of engines used at the same base. Examples are F-15s and F-16s using the F100 engine and E-3s and B-52s using the TF33 engine.⁷⁷ The wing will tend to use regional maintenance capability for jet engine intermediate maintenance (JEIM) (fig. 21). The current push is toward depot support for engines with a limited capability at the wing level.



Figure 21. Removing an F-15 Engine. The present maintenance concept allows for a jet engine intermediate maintenance capability within the 366th Wing for the F-15C/E and F-16C aircraft. KC-135 engine maintenance will remain as an off-base maintenance capability.

Based on the concept of operations and the recent experiences of the 7440th Composite Wing (Provisional) operating from Incirlik, Turkey, during the Persian Gulf War, unit maintenance must be prepared to sustain a 24-hour operation, seven days a week.⁷⁸ With the composite wing having diverse mission, design, and series (MDS) aircraft in smaller numbers and a goal to

maintain or decrease maintenance manpower, maintenance at the unit level will have to change from weapon system-specific to multiple systems-qualified. This is not an insurmountable problem, but it will require a large amount of dedicated training and an increase in maintenance trainer systems.⁷⁹ Given the actual experience of Rivet Workforce (RW) (discussed in the next chapter), this is not an easily achievable goal.⁸⁰

Transportation

The initial transportation problem for a deployment can be somewhat alleviated through the flexible prepositioning of bulk consumables, munitions, vehicles, and aerospace ground equipment (AGE) in or near an expected theater of operations (fig. 22).⁸¹ For the resupply and sustainment portion of the deployment, the task will be to "put as much of the assets as possible into the hands of the customer."⁸²



Figure 22. Munitions Storage Area. To offset the initial deployment burden, bulk consumables such as munitions should be prepositioned at strategic locations.

The current contracted transportation resupply system routes used by AFMC should be modified to include a priority air route to Pope AFB in support of the battlefield attack wing. The present structure should also be evaluated by AFMC to consider future requirements relative to not only composite wings but the two levels of maintenance system as well (fig. 23).

Future operations will require a strong logistics system that is responsive, supportive, and allows the combat units to reduce on-hand supplies. A dependable "federal express" type system needs to be developed.⁸³

The recent Desert Express transportation system worked very effectively to move high priority cargo to the theater of operations during Operation Desert



Figure 23. Air Force Materiel Command, Logistics Airlift System (LOGAIR) Routes. This map shows the FY 1992 route structure. The LOGAIR system provides in-country scheduled routes to move cargo to and from the AFMC depots. In the future, the LOGAIR system may be displaced by commercial transportation systems on a competitive basis as needed.

Shield/Desert Storm. This should become an institutionalized mode of operation in the future. The two levels of maintenance system will place even greater demands on the transportation system to move parts and equipment on an expedited basis. However, while Desert Express was an effective transportation system for the duration of the conflict, this method may not be feasible during peacetime due to budgetary constraints.

Depot Support

AFMC depots are the tributaries of logistics, connecting and channeling the nation's diverse economic capability to the war-fighting forces. The depots must provide a responsive continuity of logistics support to the composite wings. Therefore, operations must consider the inherent value of a secure logistics line of communication in selecting a deployment location for the composite wing.

The basic depot functions (requirements determination, requisitioning, and wholesale distribution) will remain the same and will be based on a weapon systems management concept.⁸⁴ The wings will continue to hold a significant maintenance capability in the areas of egress, fuels, sheet metal work, munitions, flightline maintenance, and electrical systems, but the two levels of maintenance concept will push more of the maintenance work load away from the operational combat units and toward the depot.⁸⁵ The increase in the depot work load will be accompanied by an increase in transportation demand.

Summary

This chapter has presented a rough outline of the concepts of operations and logistics support for a composite wing. A high-priority composite force will allow the national command authorities to have a ready combat force for employment anywhere in the world. The emphasis of this composite force is on combat readiness and mobility.

Two types of composite forces are under consideration: the air intervention wing and the battlefield attack wing. The 366th Wing at Mountain Home AFB will operate as an air intervention wing while the 23d Wing at Pope AFB will become the first battlefield attack wing. The actual numbers and types of aircraft assigned to the composite wings will vary as our understanding of composite wings increases. The key is not exact numbers and types of aircraft but rather that there should be an organizational flexibility that allows for rapid and easy change to meet any situation. The concept of operations states the case clearly—the overwhelming requirement for the success of the composite wing is its ability to deploy rapidly with a credible force.

Logistics support requirements will revolve around maintaining the wing's readiness and ability to deploy. Both of these requirements carry heavy burdens. Chapter 4 will offer an analysis of the logistics implications of reorganization and composite wings. Topics range from peacetime basing in the CONUS to perceived impacts on the depots.

Notes

1. Julie Bird, "McPeak Lays Out Rationale For Composite Wing," *Air Force Times* 51, no. 38, 29 April 1991, 4.
2. Composite Wing Site Activation Task Force (SATAF), Mountain Home AFB, Idaho, 22–26 April 1991, A-2.
3. Ibid., A-6.
4. Dr Donald M. LeVine, *Composite Air Wing: Command and Control*, white paper, TRW, Inc., 25 July 1991, 1.
5. Briefing, TAC/XP, subject: Composite Wings, October 1991, chart 3.
6. Ibid.
7. William Matthews, "Soviet Demise Leaves Pentagon Wondering Who Is the Foe," *Defense News*, 24 February 1992, 34.
8. Lt Col Mike Nelson, USAF, "A Concept of Operations for the Combat Air Wing," Checkmate report, 31 December 1990, 4–5. This report provides a descriptive overview of several possible uses of a combat air wing (the predecessor to a composite wing). The reader may be interested to investigate further into the potential applications of force by a composite wing along with the inherent capability of the composite wing command structure which can function as the early on joint force air component commander (JFACC).
9. Ibid., 3.
10. AFM 1-1, *Basic Aerospace Doctrine of the United States Air Force*, vol. 1, March 1992, par. 2-2b, 5.
11. Briefing, TAC/XP, chart 4.
12. Briefing, AF/LGSI, subject: JSCP/WMP Force Breakout, February 1992.

13. "Air Force to Create Two New Composite Air Wings by 1993," *Aviation Week & Space Technology*, 14 January 1991, 26.

14. AFM 1-1, vol. 1, fig. 2-1, 7.

15. Ibid., 6.

16. Ibid., par. 3-4, 10. **"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."

17. Ibid., fig. 2-1, 7.

18. Ibid., 6.

19. Ibid., 7.

20. Ibid., 6.

21. Ibid., 7.

22. Briefing, Headquarters USAF Special Study Group, 28 November 1989.

23. Lt Col Sky King, AF/XOXWF, "Composite Wings," background paper, 23 July 1991.

24. Neil Munro, "U.S. Air Force to Revamp C² Policy and Equipment," *Defense News*, 4 November 1991, 4. In this article, the writer reports the extent of the command and control changes necessary to implement the mission tasking orders' capability:

The command and control doctrine used by the U.S. Air Force throughout the Persian Gulf war will be overhauled to give fighter wings more flexibility to plan and execute air strikes, says Lt Gen Robert Ludwig, Air Force deputy chief of staff for command, control, communications and computers.

The overhaul is complemented by the Air Force's revamping of its tactical command and control networks, expected to cost roughly \$1 billion over the next six to eight years, says Ludwig.

The changes in doctrine and equipment are intended to increase the freedom of Air Force wings to react quickly, while ensuring centralized direction and coordination of forces, he said.

25. Briefing, TAC/XP.

26. Joint Publication 1, *Joint Warfare of the US Armed Forces*, 11 November 1991, 46.

27. Briefing, TAC/XP, chart 4.

28. Briefing, AF/XOXW, subject: USAF in the 21st Century, 30 August 1989, chart CFEA18.1.

29. Ibid., CFEA28.

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31. Briefing, AF/XOXW, subject: Evolving Airpower: The Composite Wing, 3 January 1991.

32. Deedee Arrington Doke and Chuck Vinch, "Composite Wing Concept Takes Off," *Stars and Stripes* 50, no. 15 (28 April 1991): 10.

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35. Col Jarrett McGehee, AFLC/XPR, *Some Thoughts About Supporting the Air Force of the Future*, white paper, n.d.

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38. Lieutenant Colonel Dan Kolpin, AF/LGXX, "Incirlik AB Maintenance Operations," point paper, 21 February 1991.

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42. Memorandum for record, Gen John W. Foss, commander, Training and Doctrine Command, US Army, and Gen John M. Loh, commander, Tactical Air Command, US Air Force, subject: Four Star Meeting between General Foss and General Loh, 2 April 1991.
43. Briefing, TAC/XP, chart 4.
44. Composite Wing SATAF, A-6.
45. Maj Dale Wrisley, AF/XOXWP, "7440th Employment Operations," point paper, 20 February 1991.
46. Headquarters TAC/XPJ, draft paper, 2.
47. Robert Mueller, *Air Force Bases: Active Air Force Bases within the United States of America on 17 September 1982*, vol. 1, The United States Air Force Reference Series, Office of Air Force History, 427-33.
48. Bird, 4.
49. Headquarters TAC/XPJ, draft paper, 2; Casey Anderson, "Mountain Home AFB Wing Detailed," *Air Force Times*, 20 May 1991, 4; and Composite Wing SATAF, A-26.
50. Headquarters TAC/XPJ, draft paper, 3, 7.
51. King, "Composite Wings"; and Anderson, 4.
52. The B-52G aircraft is considered as a future option; while the planners are showing the inclusion of the B-52s, they also note that the runways at Mountain Home AFB would have to be lengthened and widened and the maintenance structure would have to expand further to accommodate heavy bombers. The B-52s will be geographically separated from the composite wing.
53. A recent decision by the Air Combat Command placed the E-3 aircraft at Tinker AFB, Oklahoma, as a geographically separated unit (GSU). This was done to provide better usage of the scarce resources of the E-3 operational and support community. The early indications from the ACC staff are that this is a temporary measure that will last until the present E-3 missions in drug operations are completed.
54. Composite Wing SATAF; and Headquarters TAC/XPJ, draft paper, 7.
55. Mueller, 479-85.
56. Memorandum for record, Gen John W. Foss and Gen John M. Loh.
57. Briefing, TAC/XP, chart 17.
58. Headquarters ACC/XPJ, "ACC Concept of Operations for the 23d Wing," draft paper, Pope AFB, N.C., 11 May 1992, 2.
59. Briefing, TAC/XP, chart 17.
60. AFM 1-1, vol. 1, fig. 2-1, 7.
61. Briefing, AF/XOXW, subject: Evolving Airpower: The Composite Wing, 3 January 1991.
62. "Air Force to Create Two New Composite Air Wings by 1993," 26; Bird; and King, "Composite Wings."
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70. Barbara J. Wieland, AFLC/XPSA, "Impact of Composite Air Wings on POS and WRSK Costs," background paper, 20 March 1991.
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74. Composite Wing SATAF, A-17.
75. Logeman.
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77. Doug Foster, AFLC/XRPO, "Composite Wings Logistics Factors Propulsion Concerns," background paper, 5 April 1991.
78. Kolpin.
79. Colonel Dakan, AF/LEYW, "The Air Legion Concept," point paper, 28 June 1989; Lieutenant Colonel Kliev, AF/LEYM, "The Air Legion Concept," point paper, 28 June 1989.
80. TIG Report, "Functional Management Inspection: Rivet Workforce Transition, Training and Utilization," PN 91-602, 3 December 1991, 2; and Mickey McDonald, *Composite Wing Analysis*, white paper, McDonnell Aircraft Company/Strategic Evaluation Studies, 1991, 3.
81. Kolpin.
82. McGehee; and McDonald. As part of the McDonnell Aircraft Company study on composite wings and the Advanced Tactical Aircraft Program, the Strategic Evaluation and Studies section identified the following concerns for further company evaluation:
 - a. Support airlift requirements are estimated to exceed employment base unloading capability within the required deployment schedule.
 - b. Bare base support and consumable requirements are estimated to exceed support airlift availability.
 - c. Current base/austere base development schedules and resources are not compatible with mission aircraft deployment schedules.
 - d. Mission aircraft employment schedules will be severely impacted if consumable resources (munitions, bulk fuels, and jettisonable mission equipment) are not prepositioned at or near the employment base. The supposition that fuel and munitions will be prepositioned is highly positive thinking. It is highly unlikely that munitions can be prepositioned at all the potential Composite Wing deployment locations. The ability to obtain fuel off the economy may be more likely.
83. Memorandum for record, Gen John W. Foss and Gen John M. Loh.
84. Lieutenant Colonel Miller, AF/LEYS, "The Air Legion Concept Impact on Supply," point paper, 27 June 1989.
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Chapter 4

The Logistics Implications of Reorganization

Composite wings are designed to be the Air Force's premier initial response force across a wide spectrum of conflict. The Air Force is moving from a monolithic wing force structure to a composite wing force structure. Whether the composite wing can be effectively implemented in a large number of operational wing structures remains to be seen. In the meantime, there will be a transition period while the prototype composite wings are put together and tested.

The previous chapters have established what a composite wing is and how the composite wing may be employed. In this chapter, the differences between composite wings and traditional methods of organizing and operating will be discussed, and the consequences of establishing composite wings will be considered.

Peacetime Basing in the United States

"In the future, more of the punch that goes with our commitments to our allies and to our cooperative security arrangements will be based on US soil."¹ Air power maneuver will remain an important consideration in the basing and support requirements for the current and projected aircraft inventory. The Air Force will continue to depend on the availability of usable and supportable airfields within reach of the battlefield. Exceptions to this line of thought include long-range bomber aircraft such as the B-52, the B-1, and the B-2, which will promote *Global Reach—Global Power* as US-based aircraft. However, prolonged use of long-range bombers will become expensive without forward-based assistance.

Mobility

The real bottom line is that the Air Force of the future will be a CONUS-based, highly mobile organization that can deploy quickly and fight without the massive support tail required for today's efforts.²

With significant reductions of forces in overseas locations, more emphasis will be placed on acquiring and maintaining a capability to deploy. The switch from a forward-deployed garrison force to a CONUS-based expeditionary force requires the ability to deploy and to sustain that deployment.

Mobility is the key to future air power projection. In the past, logistically unprepared armies stayed on the move to forage for supplies. In contrast, today's well-supplied military forces enjoy a freedom of action that is manifested in a high degree of mobility—a mobility, however, that can be sustained only through logistics.

When composite wings are deployed, transportation problems will be different from those encountered in moving the same resources from several locations. One wing will incur the entire deployment burden. Will there be enough cargo ramp space? Enough loading equipment? The personnel required to palletize and repalletize quickly? Moving an entire composite wing of up to 75 aircraft might take several weeks using previous mobility methods, thus denying the desired "instantaneous" response; that is, in the Airborne Optical Radar Area of Responsibility within 24 hours, "full-up and ready to go." It will therefore be necessary to develop alternative responses. Two such alternatives are supply prepositioning and reducing the size of the force taken to the theater.

The desired rapid response feature of a composite wing drives the requirement that it be able to travel quickly. It must carry as much of the essential equipment and supplies required for self-sufficiency as possible, but it will still rely heavily on prepositioned logistical support material. Prepositioning is necessary to reduce the requirement for massive and immediate airlift of supplies at the beginning of a conflict. Prepositioned materials should be stored at secure locations (afloat or ashore) with priority given to mission-essential, high-volume, and heavy supplies. All prepositioned supplies should be packaged for extended storage. Each prepositioning program should be tailored to meet the unique requirements of the region being supplied.

Seaborne prepositioning appears to be more advantageous than land-based prepositioning, which requires the approval of other nations and which could result in a large degree of foreign control over US supplies—not a desired result. Some ground prepositioning may be necessary, however; and when supplies must be prepositioned in a host nation, every effort must be made to evaluate the stability of the host country as well as the accessibility and necessity of the proposed sites.

Flexibility

The traditional homogeneous wing contains one type of aircraft. The capabilities of that wing and others can be segmented and assigned to the theater CINC in quantities and at locations as needed. The composite wing may also be used in various segments, the difference being that the situation will be a one-wing deployment. The size of the force deployed from the composite wing will depend on the nature and scope of the threat.

The element of uncertainty disallows precise determination of the force structure and support mechanisms needed. And since the aircraft mix that will be needed can only be generally determined, wing structure and support mechanisms should have the flexibility to allow for rapid change. The US

Navy has long struggled with the carrier air wing, attempting to establish the ideal mix of aircraft aboard each carrier. The result has always been the same: the commanding officer is not satisfied with the actual deck loading (aircraft mix) for the scenario encountered. War does not lend itself to readily predictable answers. Therefore, the composite wing must be able to adapt.

The numbers and types of forces originally assigned to the composite wing will likely change as potential threats are reevaluated and appropriate responses are designed and prepared. The composite wing of 1993 will probably not be the same as the composite wing of 1997. Composite wings, then, present a well-defined case for establishing organizational modularity.

Organizational modularity is a building-block approach to maintaining a ready force. Organizational modularity calls for establishing a standardized interface between the support infrastructure and the operational organization. The ability to plug-in and plug-out operational units becomes important in putting together a viable composite force organization. An organization designed to be used in a generic application of force needs to have the flexibility to accommodate the actual level of conflict and situation encountered. Facilities and logistics support cannot be locked into supporting only a certain number or type of aircraft resources. The composite wing will change with changing mission requirements; its support mechanisms must be flexible enough to remain in place while providing adequate support for the changing organization.

The composite wing must use as much commonality as possible for future weapon systems support. Consider the development of common-ground support equipment, including avionics test systems, for multiple systems. Power and cooling equipment should fit all aircraft assigned. The luxury of unique support equipment is not available in this era of fiscal restraint, and the establishment of composite wings only serves to aggravate the situation.

Not all homogeneous operational wings will transition into composite wings, of course. Therefore, the logistics support required will depend on the organization supported.

A Maintenance Concept Change

The establishment of composite wings did not drive the changes in maintenance concepts that will be presented, but composite wings may benefit from the ongoing efforts. Several maintenance initiatives are taking place, each designed to ease the wing maintenance work load. Rivet Workforce and the two levels of maintenance concept will be presented here in light of their application to composite wings.

Rivet Workforce

Rivet Workforce was designed to reorganize Air Force maintenance skills to reflect the reliability of modern-day technology systems. It was also advanced

in an effort to provide cross-Air Force specialty code (AFSC) manpower to help reduce a burden on any one specialization. The concept is to increase maintenance teamwork and lateral assistance by making the work force more fluid against the maintenance requirements. However, not everyone expects the results of RW to prove its worth—especially in its application to composite wings.

In effect, Rivet Workforce reduces the level of specialization within the enlisted maintenance work force even though there is an increasing complexity of weapon systems (especially in the avionics area). When maintenance technicians are provided the opportunity for greater specialization, the quality of their workmanship improves—but within a narrow confine of effort. One would expect less overall quality, the more generalized the maintenance effort.

Two Levels of Maintenance

The success of composite wings is not dependent on the implementation of two levels of maintenance, but the two-level system does make composite wings easier to operate. It takes much of the intermediate level of maintenance from the operational organization, giving that responsibility to AFMC. In essence, having two levels of maintenance removes a significant repair capability from the wing organization and places it in a more centralized location such as an air logistics center. "According to McPeak, savings associated with the composite wing will occur over time, once the service moves to a two-level maintenance structure."³ The savings for a composite wing will depend on all of the costs involved, including the potential increase in depot-level reparable, the increased emphasis on transportation costs and high-priority movement of critical items, and the depot changes needed to improve repair response to operational needs. For the two level system to be successful, there must be continuing improvements in aircraft reliability and maintainability. Today's weapon systems are remarkably reliable and maintainable, but they were not designed and fielded to totally eliminate the intermediate level of maintenance. The two levels of maintenance system will develop over time as weapon systems acquire the desired reliability and maintainability. Improvements in the handling and tracking of parts and equipment through the repair process will also be required.

A previous test of the two levels of maintenance concept used assets from the 410th Bomb Wing at K.I. Sawyer AFB, Michigan, and the Warner Robins ALC, Georgia. The principal effort was to test the ability of the transportation system to move material in the time required.

Phase I of the Hill AFB, Utah, two-level maintenance prototype has been in the testing phase with the 388th Tactical Fighter Wing (F-16s) since July 1991. The principal effort of phase II will be for depots to demonstrate that they can significantly improve the process.

When the composite wing concept is realized in full, composite wings may be located both inside and outside the US. If so, the two levels of maintenance

concept will interface with transportation needs to an even greater extent. Because of the lengthened pipeline, there will probably be an increase in the number of spares required to maintain the desired level of support. Or, alternatively, an increase in transportation capability might suffice to serve the same purpose. Current ground rules for implementing the two levels of maintenance concept do not require an increase in the number of spare parts or depot level reparable (DLR).

Current weapon systems were not designed to be supported in small numbers in conjunction with other weapon systems; and when the two levels of maintenance system is implemented, it will probably really be a two- and one-half levels system. Regional support centers for the composite wings will likely be necessary. A regional support center would be a mini-depot or an expanded intermediate-level maintenance facility located for optimum support of two or more air bases. The use of regional support centers would be a compromise between retaining the existing intermediate level and eliminating it altogether.

Given the fact that the two levels of maintenance ground rules mandate no increase in depot inventory spares, implementation of the system may increase the requirement for line replaceable unit (LRU) spares in the supply inventory. A requirement increase (even if not funded) will be necessary to offset transportation delays due to increased pipeline times. And elimination of the intermediate level of maintenance will increase the work load at the depot. However, the Air Force assumption is that there will not be an increase in spares because the Coronet Deuce test showed that an increase in spares was not needed in order to maintain an acceptable level of aircraft availability.

The intermediate level of repair concentrates on repairing all reparable and reentering them into the base-level inventory as quickly as possible. Depot maintenance repairs only those reparable (usually in lots rather than individually) for which there is an established supply requirement. This system relies on the available spares inventory level as a buffer to insulate the production facilities from sporadic or cyclical changes in user demands. The typical depot repair is an overhaul, with the repaired unit being returned as a like-new item. At an Air Force conference held at Andrews AFB, Maryland, in April 1992, it was suggested that the air logistics centers will accomplish both depot and intermediate types of repairs.

A Supply Concept Change

The composite wing organization presents unique features to the supply system. Of initial concern is the recent supply policy that affords free access to spares during all operations.

Lack of Depth

Since all of the composite wing's forces will be required to be ready at the first moment of deployment, a supply concept that is significantly different from the previous one will be necessary. The traditional homogeneous wing was comprised of three squadrons. The first squadron was deployed within the first 24 hours, the second squadron 10 days later, and the last squadron (what remained after supporting the first two squadrons) at about the end of the first month. Using the third squadron as a built-in back-up parts system has been called *robusting*.

Robusting evolved as a result of funding shortfalls; that is, funding was inadequate to maintain all three squadrons at 100 percent readiness. The third squadron was deployed last so that it could be used as a back-up source of materials when the supply system could not provide them. The composite wing requires an increased aircraft availability rate over that which existed previously. Therefore, the need for spares and maintenance support will be greater than that which typically existed for the traditional homogeneous wing.

The base-level supply system for a composite wing should maintain 100 percent stockage of the safety level stocks. This is expensive, but it will be necessary if the stock bins are to be filled at the desired rates. The composite wing will be the premier first-response fighting force; it will need the depth of supply support required to meet its mission.

As the Air Force proceeds through a force reduction, there is a danger that logistics support for the composite wing could be underfunded. The composite wing would then be a "hollow force" because it could not sustain its fighting capability. We must ensure that the composite force does not emphasize "rubber on the ramp" at the expense of logistics support.

Increase in Supply Uncertainty

Uncertainty increases as the number of aircraft in a particular MDS assigned to the unit decreases. Uncertainty exists at all levels, but is amplified when the Air Force is moving to smaller numbers of each aircraft type. The problem is one of applying statistics to a small sample rather than a large one. Smaller samples produce probabilities that have wider margins for error. The options are to place more assets at the composite wing or run the risk of having an aircraft out of service due to lack of parts.

As the number of different aircraft types increases and the number of each aircraft type decreases, our ability to predict spares and maintenance requirements accurately becomes correspondingly more difficult. One of the ongoing efforts of the Air Force Logistics Management Center at Maxwell AFB, Gunter Annex, Alabama, is to prepare an improved forecasting model for small numbers of primary assigned aircraft (PAA). Regardless of the outcome of this effort, the best course seems to be to prepare for a "most probable" range of contingencies and to design flexibility into the composite wing. This

is the least efficient solution, however, and one that is difficult to achieve during periods of austerity.

Readiness Spares Kit

Special attention has been given to the equipping of these [Crisis Action System Force (CASF)] units. Flyaway kits will be the primary means of keeping aircraft in commission during the first thirty days of any operation, with replenishment of the kits coming from the theater or Air Materiel Command.⁴

One of the difficulties encountered in rapidly deploying a composite force is the moving of readiness spares kits to the theater of operations in conjunction with the deployed unit. When a composite wing is deployed to meet a threat, there is a requirement to deploy the RSK needed for initial support. Movement of the RSK will be complicated if it is located at the same base as the composite wing because the mobility system will be overburdened. Therefore, logistics planners should consider storing the first (seven-day) RSK at a facility that has a mobility processing capability, can be supported by airlift without interfering in the movement of the composite wing, and is located nearby. The 23-day RSK could be located at the main operating base and shipped out the following week.

Under current usage, the RSK is usually separated and shipped in segments. Under the proposed method, the first segment would be considered "untouchable." Given the high priority of the composite wing and its mission, it seems clear that the seven-day RSK should remain intact despite the current policy that "a spare is a spare." Wing commanders will indeed want to control assets that are important to mission success, but the same can be said for the storage and shipment of primary munitions that are also beyond the wing commander's control. And under the proposed paradigm, all of the RSK should stay within arm's reach of the wing commander's control. The requirement for rapid movement is reason for the wing commander to relinquish line-of-sight ownership and allow transportation to assist the deployment.

It has been suggested that materiel in the RSK is wasted because it is not available for use in peacetime operations. The counter to that argument is that RSK is an insurance policy against the eventuality of a deployment in concert with a high tempo of operations. Why would normal peacetime operations be allowed to deplete any portion of a minimally established RSK? In such a case, RSK really would not exist for the stated purpose of readiness but would be a crutch for an inadequately funded logistics system.

More Spares Required

The establishment of composite wings will force an increase in the requirements for spare parts to support the greater variety of aircraft assigned. If the squadron remains the basis for a given MDS, then the increase could be negligible. The amount of increase has been debated over the last several years, with estimates from the implementing major command and from the

Rand Corporation at significant odds. They agree that there will be an increase; the question at issue is one of magnitude.

Air Force sources say the composite wing plan could cost as much as 15 percent more in operating costs because of the added logistical support and the need for more spare parts. However, a draft analysis by the Santa Monica-based Rand Corp., submitted and briefed to McPeak and other Air Force leaders last summer, concluded that operating costs could be limited to 3 percent above current costs for operating and supporting a traditional, monolithic 72-aircraft fighter wing.⁵

There are a number of reasons that establishing composite wings will cause an increase in the requirement for spares. With a smaller number of aircraft of each type, but a larger number of aircraft at each composite wing base, the requirement for stock on the shelf will become wider with the larger variety and shallower with the fewer numbers held of each type. If analysis requires one safety spare on the shelf to support a 72-aircraft wing of the same aircraft type, the question is whether to require one spare for a composite wing that has only one squadron of that aircraft type. If so, then when three squadrons of F-15Es are reassigned from one wing to three, the requirement for one spare on the shelf becomes a requirement for three spares on the shelf. The prudent response is to require more spares rather than less. Unfortunately, it is also an expensive response. Where more than one spare per squadron has been required, any change in the requirement for a composite wing would not be so great. The base supply warehouse, however, will be required to keep a greater variety of line items. The existing supply computer systems are expected to be able to handle the increase, but existing storage areas may have to be increased. And the two levels of maintenance system will increase spares in the pipeline because there will be fewer units repaired at the wing level and more units sent off station for maintenance.

A retest-OK (RETOK) is a situation in which on-equipment maintenance personnel have identified a specific line replaceable unit as having a problem. The LRU is removed from the aircraft and replaced. The removed unit is turned into base supply for repair, but the repair facility finds that the unit meets acceptable criteria and returns it as a serviceable unit. This situation can exist because of differences in the test equipment used, system incompatibilities, technical order errors, temperamental LRUs (bad one day, good the next—also known as “bad actors”), maintenance personnel skill level, or simple human error.

Based on the structure of the composite wing, one can logically expect an increase in RETOK units as flightline maintenance capability gradually erodes due to the greater variety of aircraft assigned. Also, fewer people will be assigned to repair them, and those few will work under a generalized maintenance concept instead of working on one system for one type of aircraft. And under the two levels of maintenance system, there will be no on-base intermediate-level maintenance shop to provide the back-up expertise of on-site specialized support.

The Coronet Deuce test revealed a RETOK rate of 28 percent; that is, of every four units returned to the depot for repair, one did not require repair.

The challenge will be to reduce the RETOK rate in composite wing organizations by providing intensive training and test equipment, such as the improved Avionics Integrated Test (AIS) system, that can be transported on one pallet.

The lack of depth in the composite wing will probably force an increase in the aircraft availability requirement, especially if the composite wing does indeed serve as the premier response force as envisioned in the stated concept of operations. The increased aircraft availability requirement will, in turn, force an increase in base-level supply assets because there will be no back-up squadron for substitution or cannibalization. The base supply system will be forced to increase its safety level above that required by the traditional homogeneous wing.

The composite wing is designed to travel light and fast. This means that there will be an increased dependence on support material prepositioning to offset deployment requirements. There will be few fight-in-place forces with material available in the theater without prepositioning. The end result will be an increase in prepositioned material requirements and/or airlift requirements.

To reduce airlift requirements, supplies and equipment are prepositioned wherever possible. As a general rule, units will take only those items of equipment peculiar to their aircraft.⁶

If the suggestion that RSK be prepared in two packages—one for seven days and one for 23 days—is accepted, the packages will probably require some level of overlap. The end result, again, will be an increase in spares requirements.

Prevailing Environment Is for Peacetime Efficiencies

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.⁷

While the concept of a composite wing makes good sense for operational employment, the present fiscal environment presents difficulties for establishing and implementing those composite wings. There appears to be a dichotomy between two major competing interests—peacetime efficiencies versus combat effectiveness.

Two principal forces are driving the budget. The Office of the Secretary of Defense (OSD) is concentrating on reducing costs while senior Air Force leaders are attempting to create the most combat-effective organization possible. These two forces are at times on divergent paths—a confusing situation to say the least. The composite wing is expected to be more costly to operate than the traditional homogeneous wing.

One major unanswered question about the composite wing concept is its cost. Air Force officials have estimated that composite wing operating costs could run as much as 15 percent higher than a traditional wing because of added logistical support and the need for a wider variety of spare parts.⁸

If the operating costs are greater, the trade-off is said to be beneficial in combat effectiveness—specifically, the ability of the wing to begin the first day of a conflict completely trained and ready to operate.

McPeak, though, said he is convinced the operational benefits of allowing aircrews to train together on a regular basis in peacetime will outweigh the start-up costs and added maintenance burden associated with the new organizational concept.⁹

But, while there may be operational benefits, there are problems on the depot support side as Congress and OSD insist that the air logistics centers be operated as commercial enterprises.

It is difficult to operate a peacetime logistics system which is the same as that to be employed in wartime. It is even more difficult to operate a logistics system in peacetime which will stand up to the needs of a fast moving, stressful, urgently demanding combat support arena. In peace there are dollar constraints, constant demands for "efficiency," cautions to comply with the written procedural rules, and so forth. In wartime much of that will be eliminated or reduced and, above all, in the combat support arena will be the constant demand for "effectiveness"—meeting needs when they exist.¹⁰

Logistics is applied military economics.¹¹ We must continue to recognize that national resources are limited and that they must be used wisely to preserve our combat capability advantage over potential adversaries.

Military logistics is closely related to politics and economy. In peacetime we do what we can under the constraints of political activity which limits budgets and often dictates our military logistics actions.¹²

"We ought to acknowledge at the outset that composite wings may be somewhat more expensive to operate," McPeak wrote. But he argued that many bases, particularly at overseas locations, already are set up as rudimentary composite wings, although different commands may own the various aircraft. He cited Kadena AB, Okinawa, Japan, and Elmendorf AFB, Alaska, as examples. Both have a mix of fighters, airborne warning and control planes, electronic jammer aircraft, tankers, transports, and rescue and recovery assets.¹³

Force Modernization

For the future, force modernization is expected to remain the first priority. However, the assessment is that aircraft must last longer than the average 11 years of the current inventory. Budget reductions will result in fewer aircraft starts and more aircraft modifications.

The Air Force will not have the luxury of designing and implementing new weapon systems to be supported exclusively within a composite wing. Nevertheless, the fielding of composite wing supportable systems with a focus on system commonality will be a long-term goal as the aircraft are designed and replaced.

Support of Current Forces

Operations, training, and logistics support will be the second priority in the allocation of funds. The composite wing will require a larger pro rata share of those funds than the traditional homogeneous wings.

The peacetime economy does not effectively provide for an increase in logistics expenditures to maintain a smaller, more combat-capable force. In fact, Congress will view a smaller force structure as an opportunity to reduce logistics support even further. Air Force leaders must be advocates of adequate support funding for the composite wing.

Readiness

The funding provided for war preparation—to preposition material, to buy war reserve materiel (WRM), to buy chemical warfare suits—is normally the last to be supported. The perception has been that the system can surge faster than it can produce a whole airplane; that is, that it will take longer to produce an entire new aircraft than to acquire spares and modify existing aircraft.

The supply focus is on economics; the operational focus is on the mission. The overall result of the business method approach to distribution will be an increased separation between the operations community and the support community. The relationship will be that of customer-supplier rather than teamwork. If the customer doesn't have the money, the supplier will not provide the service. There will exist a sense of detachment between the two communities. But what will happen when the composite wing goes to war?

In combat logistics, the economic use of resources has a different meaning. In combat, economy has to do with tactical success and saving lives. Thus, the use of resources is not so much measured in cost but, rather, in maintaining continued availability of those resources for needs on demand.¹⁴

Combat logistics must be directed only to combat victory and to survival of the maximum number of troops and preservation of the maximum combat materiel. Combat logistics, under these conditions, cannot and must not be required to conduct "business as usual" in the manner of military logistics.¹⁵

Stock Funding

Stock funding requires wing commanders to pay for repair of depot level reparable. Every year, the wing will be allocated funds that can be used to pay for these repairs. The system was designed to promote cost consciousness and to help reduce overall expenditures. Instead of buying spares from the stock fund, wing commanders will repair as much as possible within unit maintenance. They will therefore strive to keep as much maintenance capability as possible within the unit.

One of the contradictory features of the two levels of maintenance system is this recently implemented stock funding of DLR. This change has moved funds from the depots to the operational wings. The idea is to increase base-level repair capability, gain better tracking and control of weapon system

costs by having the wing pay for repairs at the depots, and provide an incentive to reduce costs. The question now arises as to whether the composite wing funding can be tracked back to specific weapon systems—a secondary objective of DMRD 904.

Summary

This chapter has reviewed the implications of changing to a composite wing format. The change will affect basing, mobility, flexibility, and uncertainty. Maintenance will be impacted by Rivet Workforce and two-level maintenance. The supply system will be impacted by a lack of depth in the composite wing, proposed changes for managing RSK, and an increase in the number of spares required.

The change to a composite wing format is being accomplished during a period of fiscal austerity, creating a divergence of goals for the people tasked with implementing and operating composite wings and supporting systems. Stock funding sends mixed signals to the operational wing commander: the composite wing is supposed to establish a two levels of maintenance system, but is required to pay for spares repaired at the depot—a move which encourages the wing commander to keep as much maintenance capability as possible in the wing.

The next chapter discusses the mission of AFMC and the impact that composite wings will have on the depot. Some concepts that require further consideration, such as deployability and the depot repair cycle, are also discussed.

Notes

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2. Col Jarrett McGehee, USAF, "Some Thoughts About Supporting the Air Force of the Future," AFLC/XPR white paper, n.d., 2.
3. Barbara Opall, "TAC Officials Say Composite Wing Proposal is Prohibitively Expensive," *Defense News*, 17 June 1991, 12.
4. Brig Gen Henry P. Viccellio, USAF, "Composite Air Strike Force," *Air University Review* 9, no. 1 (Winter 1956–1957): 31.
5. Barbara Opall, "Air Force to Restructure Tactical Forces," *Defense News*, 14 January 1991, 3.
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7. Air Force Manual (AFM) 1-1, *Basic Aerospace Doctrine of the United States Air Force*, vol. 1, March 1992, par. 4-2, 17. In volume 2, under Essay W, "Organizing to Win," the doctrinal support documentation continues with a discussion on how "training and readiness can be subjected to detailed attack by budgeteers." The unfortunate result is that "individuals and entire organizations can become confused as to their priorities."
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9. Opall, "TAC Officials Say Composite Wing Proposal is Prohibitively Expensive," 12.

10. Jerome G. Peppers, Jr., "Some Thoughts on Combat Logistics" (Wright-Patterson AFB, Ohio: School of Systems and Logistics, Air Force Institute of Technology), October 1988, 1.
11. Ibid., 4.
12. Ibid., 2.
13. Doke and Vinch, 10.
14. Peppers, 4.
15. Ibid., 5.

Chapter 5

Depot Support for Composite Wings

What is an air logistics center and what can it do? How will the introduction of composite wings affect the operation of a large maintenance depot? The first part of this chapter will provide an overview of the Air Force aviation depots. The second part will consider the impacts of composite wings on the depot structure.

Definition of Logistics

Logistics is the foundation for sustaining all Air Force operations. The successful planner must understand the support of operational units, and the reader must be reminded of what logistics is really about.

“Logistics is a system established to create and sustain military capability.”¹ The dual verbs “create and sustain” in the above definition presage the merger of Air Force Systems Command (create) and Air Force Logistics Command (sustain). The merger of the two commands will be presented in more detail later. This chapter will focus on AFMC and its ability to sustain the new composite wing organization.

What Is a Depot?

An Air Force aviation logistics supply and maintenance depot is called an air logistics center. A typical air logistics center has responsibilities for specific weapon systems and commodities. These systems and commodities are assigned to product directorates, which are responsible for maintaining and supporting all aspects of the weapon system (fig. 24).

AFMC (formerly Air Force Logistics Command and Air Force Systems Command) owns five air logistics centers located throughout the US. These and other major installations are shown in figure 25.

- Ogden Air Logistics Center, Hill AFB, Utah (OO-ALC)
- Oklahoma City Air Logistics Center, Tinker AFB, Oklahoma (OC-ALC)
- Sacramento Air Logistics Center, McClellan AFB, California (SM-ALC)
- San Antonio Air Logistics Center, Kelly AFB, Texas (SA-ALC)
- Warner Robins Air Logistics Center, Robins AFB, Georgia (WR-ALC)



Figure 24. San Antonio Air Logistics Center. Depot maintenance and upgrade modifications are big business for Air Force Materiel Command. B-52 and C-5 aircraft are shown inside the largest hangar in the world at the San Antonio Air Logistics Center.

The manufacturing and production industrial base in the commercial sector operates on a contractual basis, relying on the predictability of stable production schedules. The depots were established as maintenance and repair facilities having a wartime surge capability that may not exist in the commer-

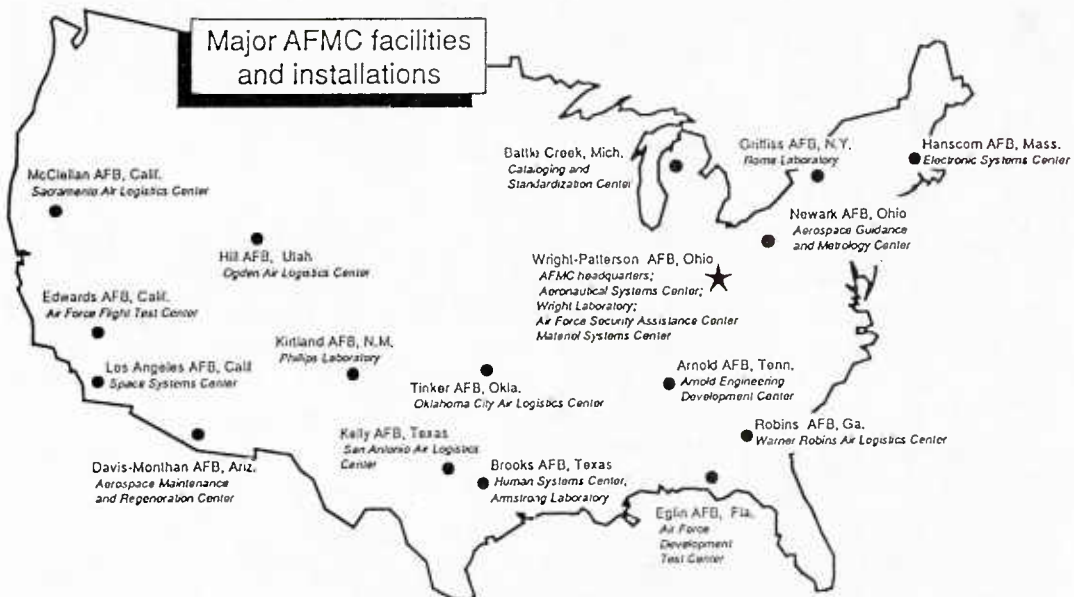


Figure 25. Major Air Force Materiel Command Facilities and Installations

cial sector—thus the use of the term *insurance model* for an air logistics center. An air logistics center is classified as following an insurance model while commercial sector contractors are said to follow a manufacturing/production model. The two models work together to constitute the national industrial base, which funnels and prepares war-fighting materials (fig. 26). The air logistics center surge capability was used successfully during the Desert Shield/Desert Storm operation, but the commercial industrial base failed in some areas to show a capacity for rapid response to operational needs.

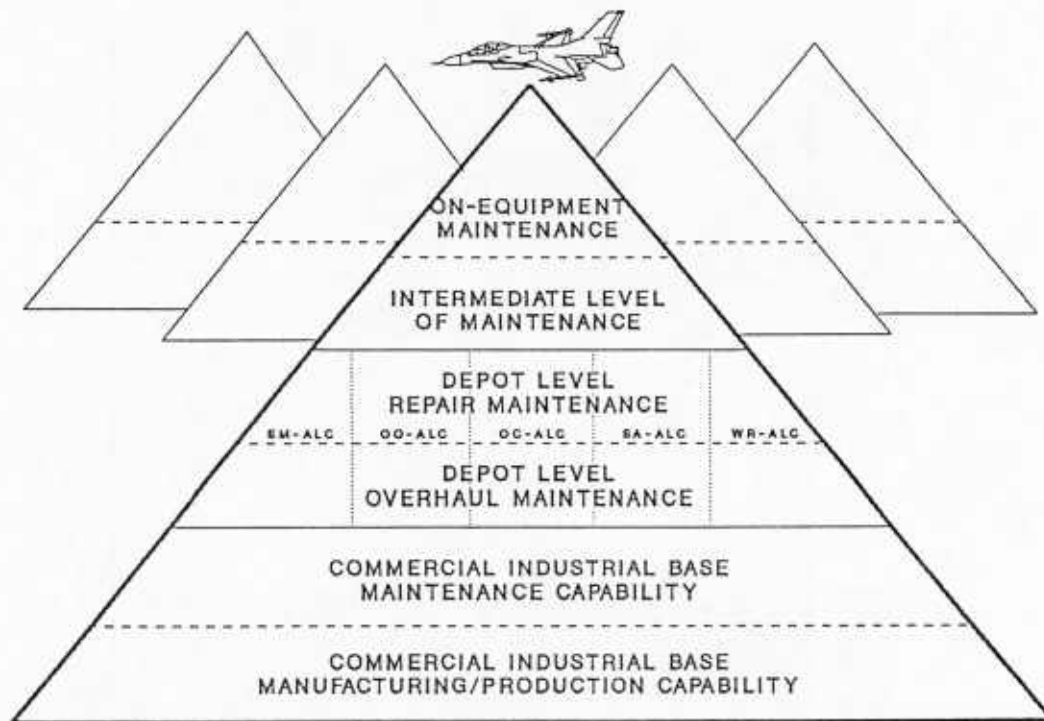


Figure 26. Tributaries of Logistics. This chart attempts to demonstrate the overall logistics system. The flow of logistics support begins at the bottom of this figure from a broad base of commercial industrial resources and works upward toward the specific weapon system. The on-equipment and intermediate-level maintenance capabilities are at base level and may be reduced to on-equipment maintenance only when the two-levels-of-maintenance system is employed. Note that there is also a horizontal cross-flow of support that exists at each level as well as the apparent vertical flow.

AFMC depots are logistics tributaries that connect the nation's economic capability to its war-fighting forces. The air logistics centers are far removed from the battlefield and do not share in the vulnerability of the frontline fighting forces. The majority of the depot work force was not personally or directly affected by Desert Shield/Desert Storm. Certain items were surged, and a number of people were involved in working overtime, but the support

and operational communities have grown noticeably further apart. This feeling of distance between the two communities will increase as the depots operate in a more businesslike fashion with an emphasis on cost-effectiveness (figs. 27 and 28).



Figure 27. Balancing C-130 Aircraft Propellers. This is a depot maintenance activity performed at the Warner Robins Air Logistics Center, Georgia.

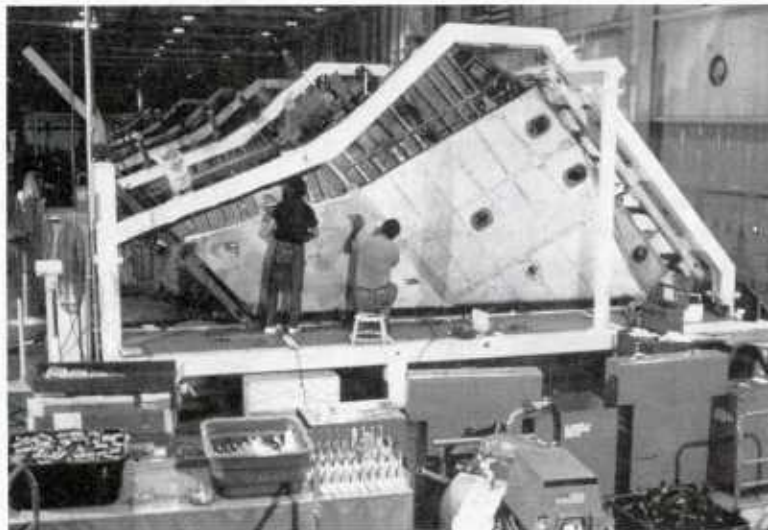


Figure 28. Repairing F-15 Wings. F-15 wings are removed and reworked as part of a thoroughly planned depot maintenance support program. This facility is located at Robins AFB, Georgia.

AFMC's role in the logistics system has finite boundaries. Weapon systems modification management and scheduled depot work are the principal activities of the air logistics centers. Most of the Air Force's transportation and supply needs are being met by the Transportation Command (TRANSCOM) and the Defense Logistics Agency (DLA).

Air Force Materiel Command

In July 1992, Air Force Systems Command and Air Force Logistics Command merged to form the new Air Force Materiel Command.

Through the integrated management of research, development, test, acquisition, and support, we advance and use technology to acquire and sustain superior systems in partnership with our customers. We perform continuous product and process improvement throughout the life cycle. As an integral part of the Air Force war fighting team, we contribute to affordable combat superiority, readiness, and sustainability.²

The combining of AFSC and AFLC is a reuniting of the research and development function with the logistics function to better "create and sustain a military capability." No longer will there be a weapon systems program management responsibility transfer (PMRT) between the two commands.

AFMC has developed an integrated weapon support management (IWSM) program designed to improve business practices through a "cradle-to-grave" philosophy. IWSM provides the operational commands (users or customers) a single face that "covers all aspects of integrated weapon system management and establishes a clear line of accountability and responsibility that enhances responsiveness."³

Guiding Principles

AFMC has also established a set of guiding principles that will provide direction for the future. The eight primary principles are shown below.

1. Build on the strengths of both former commands. Both of the former major commands brought certain good qualities to the merger, and the new command desires to capitalize on those strengths.
2. Identify improved business practices. The use of total quality management principles will help make the changes necessary to improve the cost-effectiveness of the new command.
3. Employ the integrated weapon systems management concept (cradle-to-grave). This new program is designed to provide a single point of contact for the operational user, from acquisition to the end of service life.
4. Produce a seamless organization. The emphasis will be on bringing the two commands together to provide a single life-cycle thread of continuity.
5. Provide a single face to the user. A single organization will be responsible for each weapon system. The makeup of the organization will necessarily

change over time. Elements may be located at several different locations, and the program manager may change locations (depending on the emphasis of the program).

6. Enhance responsiveness. AFMC will strive to move new research and development findings into weapon system products without unnecessary delays.

7. Include a competitive strategy. This will instill a business approach to the command's operation. Goals and methods will be continually updated.

8. Incorporate a total quality philosophy.

Command Resources

AFMC will control 52 percent of the Air Force budget, 86 percent of the foreign military sales (FMS) budget, 18 percent of Air Force military personnel, and 42 percent of Air Force civilians. The civilian/military mix for AFMC will be 70/30; the mix for the rest of the Air Force is 30/70.⁴ In addition to the air logistics centers, AFMC will also operate the facilities and locations shown below:

- Laboratories will research new technologies.
 - Armstrong Laboratory, Brooks AFB, Texas
 - Phillips Laboratory, Kirtland AFB, New Mexico
 - Rome Laboratory, Griffiss AFB, New York
 - Wright Laboratory, Wright-Patterson AFB, Ohio
- Product Centers will develop new weapon systems.
 - Aeronautical Systems Center, Wright-Patterson AFB, Ohio
 - Electronic Systems Center, Hanscom AFB, Massachusetts
 - Human Systems Center, Brooks AFB, Texas
 - Space and Missile Systems Center, Los Angeles AFB, California
- Test Centers will evaluate new weapon systems.
 - Air Force Development Test Center, Eglin AFB, Florida
 - Air Force Flight Test Center, Edwards AFB, California
 - Arnold Engineering Development Center, Arnold AFB, Tennessee
- Other direct reporting units (DRU) will accomplish a variety of missions.
 - Aerospace Guidance and Metrology Center, Newark AFB, Ohio
 - Cataloging and Standardization Center, Battle Creek, Michigan
 - Aerospace Maintenance and Regeneration Center, Davis-Monthan AFB, Arizona

AFMC will have the ability to establish weapon system requirements and to provide research and development, acquisition, product testing, initial spares stockage, and depot maintenance. There will also be capabilities for aircraft battle damage repair (ABDR). AFMC has lost the general purpose capability for supply warehousing and transportation functions—consolidation has resulted in those taskings and responsibilities being reassigned to the DOD level.

Customer Base

The establishment of a more businesslike activity will force the depot to recognize who the customer is. If the current trend of force structure draw-down continues, there will be fewer active forces and a shift toward support for reserve and guard units, sister services aviation, and foreign services. The composite wing will be a smaller customer than the traditional homogeneous wing has been.

The program director (PD) for a given weapon system is usually a colonel. The PD will have a larger number of units with which to be concerned, but fewer aircraft will be assigned to each unit.

A wing commander in charge of a composite wing cannot afford to allow aircraft to be out of service for any long period of time. Aircraft in the composite wing will represent a greater percentage of assigned assets than in the traditional homogeneous wing. Therefore, an unserviceable composite wing aircraft is a problem that must be fixed immediately.

With a larger variety of aircraft types and fewer aircraft of each type, the significance of each aircraft will increase. The PD is accustomed to having a number of unserviceable aircraft within a wing, but that situation will not be acceptable to the composite wing commander. The PD must therefore become more sensitive to the needs of composite wings.

Depot Repair Cycle

"Put as much of the assets into the hands of the operational user as possible."⁵ How can the logistics system provide the necessary level of support to the composite wing under the two levels of maintenance system? Previously, the support provided to the traditional homogeneous wings was based on a three levels of maintenance system. The key to the answer lies in improving the speed of all logistics activities that support the composite wing or, as it may be called, reducing the overall pipeline time.

Depot repair cycle is a measure of the responsiveness of the logistics system to the repair needs of the operational user; that is, the number of units or spare parts that can be generated in a period of time. Depot repair cycle is related to inventory levels (supply), in-transit time (transportation), and the time required to return spare parts to a serviceable condition (maintenance).

As long as local base supply stocks are adequate, the depot repair cycle is not an immediate issue to the operational user. The depot repair cycle is a measure of concern for the operational user only when base-level stocks are depleted (or are near depletion) and the user needs a serviceable spare part. That is when the clock starts ticking on the depot repair cycle. The following points are relevant to the air logistics center.

The first way to improve the depot repair cycle is to increase the supply inventory. As supply inventory levels are increased, a throughput increase (an increased number of units supplied in a given period of time) is apparent

to the operational user. As supply inventories are decreased, the depot repair cycle is increasingly reliant on the speed of transportation and repair to maintain the same level of service to the operational user.

The disadvantage of increasing supply inventories to improve the depot repair cycle is that it significantly increases cost, especially when units are maintained in excess of requirements. Excess supply inventory becomes a drain on national resources to the detriment of other war-fighting requirements. Supply inventories can also be unnecessarily increased due to having components in the repair cycle that end up being retested as OK. The depot repair cycle issue is critical enough without the erroneous removal of good spare parts.

"Just-In-Time" (JIT) is a supply inventory reduction technique aimed at reducing as much as possible the on-hand material inventory used for production—and sometimes maintenance—work. Can JIT be useful for non-standard flow types of parts supply?

There is too much uncertainty concerning the required levels of inventory stocks to apply the full JIT concept to the air logistics center. The air logistics center, unlike the commercial manufacturing/production model, does not have the predictable course that is necessary for minimizing the material inventory on hand. The depots cannot adequately predict their work loads. JIT is aimed at economic efficiency where a "stock-out" condition has a limited penalty. When the goal is combat effectiveness, a "stock-out" situation can result in mission failure.

In reality, the objective of each item manager functioning within the air logistics center is to reach a delicate balance between minimizing on-hand inventory levels and providing adequate support to the wing's flying operations. It costs money to hold and store inventory, but at the same time, there is a great deal of uncertainty and unpredictability as to what parts will be needed. All of the elements of JIT exist within the air logistics center. What is lacking is a stable and predictable environment in which to apply the true principles of JIT.

At present, the reparable (unserviceable) level of inventory is large because current funding is inadequate to repair these assets. They are therefore held in unserviceable condition, as a potential surge capability for future conflict requirements, until the item manager has the necessary resources to effect the repair.

Previously, depot level reparable funding was appropriated directly to the air logistics center on a basis of perceived operational need, which was determined by using standard failure rates against a projected operational flying hour estimate. That funding is now allocated to the operational organization, which will pay for spares withdrawn from the base supply system. There is no more "free issue" of spares from base supply to the operational organization. The stock fund will receive payment for the spare part at the time of sale to the using organization.

A second way to improve logistics throughout is to decrease transportation time (fig. 29). Any time that supply material (serviceable and unserviceable) spends in the transportation cycle is nonproductive. One possibility for decreasing transportation time is to use forward-based regional repair facilities to reduce the distance between the user and the repair center. Another possibility is to use appropriate priorities for returning needed parts. A decrease in the depot repair cycle time will be especially necessary for high-value, low-quantity reparables. These specific items should be identified by item managers and given a higher priority in the transportation network—including return of reparables from overseas locations, which usually receive a very low transportation priority.



Figure 29. Night Loading a LOGAIR Aircraft. LOGAIR routes are commercially operated on a contract basis.

With low numbers of same-type aircraft in each unit, it will be difficult for the item manager to decide where to place the spares that are available. As a result, there may be an inclination to regionalize the base-level supply system to optimize transportation and response capabilities.

A third method for improving the depot repair cycle is to decrease the time required to repair unserviceable units. The air logistics center should strive to reduce component repair times to the absolute minimum while at the same time implementing quality maintenance techniques that may initially increase repair times but save time later by producing parts that will not have to be repaired as often.

The two levels of maintenance system is dependent on the supply and transportation system to route repair items rapidly. The previous intermediate level of maintenance could return an expedited LRU/shop replacement unit (SRU) back to the on-equipment maintainer in a short time. With

that capability now removed, transportation becomes a major issue. Improving the depot repair cycle will become a necessity for the future success of the composite wing.

At present, control of reparables going into the air logistics center for repair is provided through a computer analysis program called Distribution and Repair in Variable Environments (DRIVE).⁶ On a two-week interval, DRIVE uses data on stock levels, available maintenance capability, and predictions on future flying hours to prepare a listing of parts that should be repaired. The objective of DRIVE is to maximize repair capability and optimize maintenance repair facilities. DRIVE can be improved if it can be made to operate on a real-time basis instead of in batches every two weeks.

Another way to enhance the depot repair cycle would be to use regionalized maintenance facilities (which could be either fixed-base or mobile). This is in essence a compromise between the previous three levels of maintenance and the proposed two levels of maintenance. A regional facility moves the repair capability away from the immobile air logistics center and closer to the operational user. The result is a significant reduction in the time required to move serviceable and reparable units.

In a related topic, AFMC can also enhance the logistics throughput by using mobile combat logistics support systems (CLSS) for time compliance technical order (TCTO) changes and small aircraft modifications in the field. This type of maintenance provides the responsiveness necessary for improving logistics throughput.

Priority Support for Composite Wings

Item managers and PDs will need to recognize the rationale for establishing the composite wings and to give them the increased level of support they need to meet their missions. The composite wings are different in that they do not have the luxury of aircraft depth that the traditional wing has had. They will therefore be severely disadvantaged when any of their aircraft are not operational. Composite wings should receive the best line support and the best maintenance capability, and they should be first in line for new aircraft modifications.

Deployability

How can AFMC assist the composite wing to minimize the logistics "footprint" in deployment situations? The first answer from Air Force Materiel Command is an unequivocal statement that the two-level system of maintenance needs to be made fully operable. Several methods are available

for improving the composite wing's deployability. They include prepositioning bulk material (munitions and fuel) in critical areas of potential conflict, consolidating the design of support equipment to maintain more than one weapon system, segmenting the 30-day RSK into two components of an initial seven-day package and a follow-on 23-day package, and reducing technical order bulk by using an automated, hand-carried, and rugged computer read-out system.

The principal obstacle is the large size of the required airlift package and the short time available for the composite wing to move to where the fight is (fig. 30). Previously, various bases were tasked to provide different portions of the forces that would be combined into a composite force in the theater. Now, one base will have to deploy what several bases did before, and "most have insufficient ramp, loaders, vehicles, or POL [petroleum, oil and lubricants] capacity to handle such a tasking within short response times."⁷



Figure 30. Cargo Loading for Deployment. A wing deployment can generate tons of material to be airlifted for initial support and then sustainment operations.

Future weapon system acquisitions must stress commonality of parts as well as multiuse and multimission equipment. This applies not just for Air Force equipment, but also for interservice and allied equipment. But the trade-off is that commonality and multiuse equipment tends to degrade specialized weapon system performance.

Logistics information is essential in controlling military resources. This study therefore suggests that AFMC be allocated a satellite-based worldwide information system dedicated to supply and maintenance tracking. Such a system would facilitate the efficient and productive logistics support that will be necessary for operational composite wings.

Logistics Management Information Systems

With the increased complexity of technology, communication and information can be deciding factors in determining whether available national resources can be applied in combat. Without good information sources and communication systems, logistics support cannot provide optimal support to the operational forces on the field of battle.

The composite wing commander will require a significantly improved management information system. To coordinate a large and complex composite force with the speed required, the wing commander must have a faster and more accurate information system than those previously used. This system will have to be deployable, and it must be able to interact with operations planners, intelligence staffs, and air logistics centers.

With increased demands for improved business-type performance, the air logistics centers will necessarily rely on management information systems. They must know the real-time status of spares and reparable inventory in order to reduce inventory levels. Inventory levels are higher and not well controlled when the ALCs don't know exactly what they have or where they have it. Transportation and maintenance also require accurate assessments of the latest information available.

The Recoverable Consumption Item Requirements System (D041) does not presently use location data in its requirements computation. The system uses only total flying hour usage, which does not account for increased spares required in the pipeline to support composite wings.

Summary

The hallmark of airpower in every war since airpower's emergence has been mission flexibility—and that flexibility is being eroded away by dependence on highly trained specialists and complex intermediate shops. You must reckon with this reality as you bring on board the systems of the future. People and expensive training are no longer easily replenished resources.⁸

The composite wing is not a new idea. The logistics system has shown its ability to support composite wings throughout the history of the Air Force. A number of current organizations are already composite and are easily supported. The Desert Shield/Desert Storm experience has shown that forces were, in fact, stationed in composite nature for many of the unit deployments. And the supply systems evolved into integrated systems networked back to the depot support infrastructure.

Composite forces will now be stationed as composite units within the US during peacetime, but with a designated mission of rapid deployment anywhere in the world. The logistics system will adapt to the new units, and

the cost of operations will be absorbed and become the new standard. Additional funds for operating and maintaining composite wings will be necessary in order to maintain combat capability.

Notes

1. Jerome G. Peppers, Jr., *Military Logistics: A History of United States Military Logistics 1935-1985* (Huntsville, Ala.: Logistics Education Foundation Publishing, 1988), iv.
2. Briefing chart by Colonel Balven as presented at the Logistics Group Commander's Course, Tab I.
3. Ibid.
4. Ibid.
5. Col Jarrett McGehee, AFLC/XPR, "Some Thoughts about Supporting the Air Force of the Future," white paper, n.d., 1.
6. While DRIVE is what is currently in use, alternatives are already under consideration and evaluation by the Air Force Logistics Management Center.
7. Lieutenant Colonel Bielowicz, "Some Comments Regarding the Air Legion Concept," AF/LEYYS paper, 29 June 1989.
8. Lt Gen Leo Marquez, USAF, Retired, address at Aeronautical Systems Division Program Manager Awards Banquet, 1985.

Chapter 6

Conclusions and Recommendations

The establishment of composite wings presents a number of logistics implications. Composite wings are being established during the early stages of a major Air Force organizational restructuring and in a period of increasing national economic constraints. These factors must be taken into account in any analysis of the impact that composite wings are likely to have on AFMC operations. The research and analysis that support this paper suggest the conclusions and recommendations discussed here.

Conclusions

There will be fewer aircraft in the future Air Force inventory, with the result that more emphasis will be placed on aircraft modifications. There will also be an increased reliance on the Air Force Reserve and the Air National Guard with the result that less than 50 percent of AFMC's customer base will be in the active forces.

Many different types of wings will exist but all will be under the objective wing umbrella. There will be traditional homogeneous wings, combined wings, and composite wings, depending upon the roles and missions assigned. Composite wings will not necessarily have linear pro-rata shares of all types of aircraft—only those aircraft that are required for an initial combat capability will be assigned because they must maintain high degrees of mobility and flexibility.

Composite wings will have an organizational flexibility that allows for rapid and easy change to meet any situation. They will have the ability to plug-in and plug-out operational units so as to put together a viable composite force to meet any mission requirement. Organizational modularity calls for the establishment of a standardized interface between the support infrastructure and the composite wing organization.

The current peacetime concept of composite wings is different from that of the Composite Air Strike Force of the 1950s. However, mobility was and is the key to force application. Today's composite wing has an increased responsibility for maintaining a rapid deployment capability from a peacetime base. And the Air Force is still dependent upon the availability of usable and supportable airfields within reach of the battlefield.

A lack of depth combines with an operational mission to drive a requirement for a high aircraft availability rate within the composite wing. As the numbers of each aircraft type assigned to the composite wing decrease, the ability to adequately predict spares and maintenance requirements decreases.

The implementation of two levels of maintenance in support of the composite wing may well turn out to be two- and one-half levels. For both overseas and US-based composite wings, regional support centers will most likely still be necessary. More spares will be required to support a composite wing, and there will be increases in the cost of operations and maintenance.

AFMC is well structured to handle composite wings through the weapon system-based product directorate organization at the air logistics centers. However, logistics information systems are essential; they must be continually improved to offset funds reductions.

One helpful factor is the experience USAF has had with the Air Force Special Operations Command. There are a number of similarities between the organizational structure and support mechanisms used for the first two composite wings and those used for Special Operations Command.

The supplier focus is on economics while the operational focus is on the mission. The overall result of the business method approach could be an increased separation between the operations community and the support community. Reorganizing the combat wings into composite organizations tends to complicate the problem even further. On the positive side, however, is the fact that one enduring characteristic of the logistics system is its continuing adaptability to new and changing situations. AFMC should have no insurmountable difficulty in supporting composite wings.

Recommendations

Composite wings are the right approach to improve combat effectiveness, but a composite wing costs more to operate and maintain than a traditional homogeneous wing. And this increased cost comes at a time when there is a national economic downturn. Therefore, the principal recommendation of this study is to give the composite wings the logistics support they will need in order to survive.

There are other recommendations, of course—all supportive of the principal one. For example, the depot repair cycle in support of the composite wings should be improved. Improvement efforts should focus principally on base-level, transportation, and depot processes.

AFMC, in conjunction with the operational command, should request a higher supply priority for the composite wings than that given to contemporary wings. A high priority will be needed to support the unique mission of the composite wing and counter its lack of depth.

Item managers should critically review spares requirements and reparable inventory levels in preparing for composite wings. The base-level supply sys-

tem for a composite wing should consider no less than 100 percent stockage of the safety level stocks.

A composite wing will have fewer numbers of each type of MDS aircraft. There must therefore be either higher aircraft availability or an increase in the size of the assigned Readiness Spares Kit if the composite wing is to achieve the readiness states that are being projected.

Assigned RSKs should be fragmented into small seven-day RSKs, augmented by follow-on 23-day RSK segments. This method will provide the traditional 30-day RSK capability while reducing the initial airlift needed to deploy the wing. The first set of RSKs should be stored at a nearby regional location that can be supported by airlift without interfering with the movement of the wing. The advantage lies in speeding up RSK movement and operational wing deployment. The disadvantage is that the wing commander will not have daily visibility or control of the RSK.

Prepositioning in most contingency areas of operations should be increased. Greater use should be made of shipborne prepositioning with roll-on, roll-off stocks.

Forward-based regional repair facilities should be established to reduce the distance from the user to the repair center. Priorities should be raised for return of such needed reparables as high-value, low-quantity units.

DRIVE should be made to operate on a real-time basis (instead of once every two weeks), and with an electronic media output in addition to the present hard-copy output.

Aircraft maintenance specialization at the unit level will have to change from weapon system-specific to multiple systems-qualified. This will require more individual training and an increase in maintenance trainer systems.

The current logistics airlift (LOGAIR) routes used by AFMC should be modified to include Pope AFB. The battlefield attack wing based there should be supported.

The recent Desert Express transportation setup worked effectively to move high priority cargo to the theater of operations during Desert Shield/Desert Storm. This should become the institutionalized mode of operations for contingency and wartime usage when deployed operations commence.

The operational commands should conduct a deployment test for the air intervention wing and the battlefield attack wing to evaluate their ability to operate from the initial RSK through the follow-on RSK in a bare-base environment (like Coronet Warrior, for example).

To the extent budget requirements permit, AFMC should invest more time and effort in finding new technologies to support a CONUS force with a rapid power projection capability.

We welcome your comments on this research report or opinions on the subject matter. Mail them to: CADRE/RI, 401 Chennault Circle, Maxwell AFB AL 36112-6428.



Logistics Implications of Composite Wings

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