

Air Force Aerospace Power

The United States relies on the Air Force and the Air Force has never been a decisive factor in the history of wars.

—Saddam Hussein
29 August 1990

Since its emergence as a global power in World War II, the United States has indeed relied on aerospace power as a major component of its national strength. Those individuals who have belittled aerospace power's relevance to modern war have based their judgment on selective evidence and often have been guilty of wishful thinking. Some have paid a high price for their flawed reasoning. The effectiveness of aerospace power was clearly on display during Operation Desert Storm. Desert Storm was a coalition effort, and the United States' effort involved all the services. But the bulk of the coalition air effort, as Saddam Hussein guessed, was the core component of US aerospace power, the Air Force.¹ In the context of this essay,

United States air power is defined as the United States Air Force—not because of its name or any theoretical concept that air power must be unitary, but because of the military tasks that have been assigned to the Air Force, that it is organized and prepared (given the means) to perform, and that will not be performed at any significant level of effort except by the USAF.²

Department of the Air Force The Military Requirement

A separate United States Air Force was established only after airpower had matured sufficiently to undertake major military campaigns, and World War II had demonstrated the need for centralized command of air forces. The process of developing airpower in the United States was uneven, reflecting the difficulty almost all institutions experience in adapting to new conditions.³

The first United States air “service” was a subcomponent of the US Army Signal Corps, the support arm assigned to explore aviation’s military potential. Not surprisingly, during this time official views of airpower’s potential were largely confined to discussions of Signal Corps concerns.⁴ Still, the restricted role of aircraft before World War I was due more to their limited capabilities than lack of vision.

In the absence of imminent national danger (usually the most powerful catalyst for change) early efforts to justify a separate air service failed in the United States, even as air capabilities were maturing. The first effective call for an independent air force was voiced in Great Britain by the Smuts Committee, which was formed to frame a response to German air raids on London in World War I.⁵ While advocates of airpower in the United States fought to emulate the achievements of the Smuts Committee, the existing US military departments insisted that more evidence was needed to establish that a separate air force was a military necessity.⁶ Such evidence was eventually supplied by increasingly capable airpower and its accomplishments in World War II.

As contrasted to World War I, air forces largely determined the conditions under which all forces operated in World War II. Improvements in range, speed, reliability, weapons, tactics, and strategy made airpower the best means to achieve a variety of objectives and the only means to accomplish many tasks. As Adm William F. Halsey explained to the House Committee on the Armed Services in October 1949, “The lesson from the last war that stands out clearly above all the others is that if you want to go anywhere in modern war, in the air, on the sea, on the land, you must have command in the air.”⁷

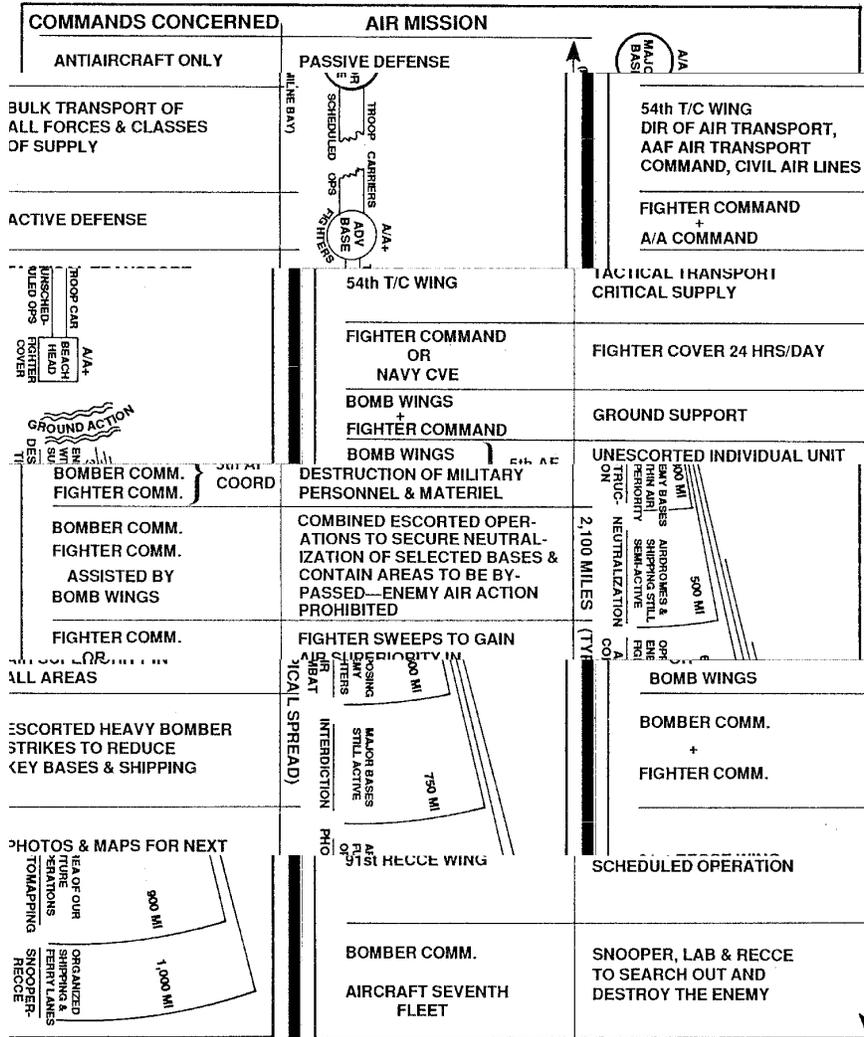
The fact that control of the air was best pursued by air forces operating under centralized command was confirmed repeatedly during that war. For example, Gen Carl A. Spaatz discerned unified command as the key to success in the Battle of Britain.⁸ The cost of dividing military airpower (and treating it as an auxiliary of surface arms) was clearly demonstrated by the Japanese army and naval air forces.⁹

When air forces secured control of the air, an immense array of missions could be performed by flexible, centrally controlled airpower. Ironically, the flexibility of airpower led to a new problem: the danger that the diversity of tasks airpower could perform in satisfying the needs of tactical commanders would lead to dilution. The tension between airpower's versatility and the need to focus military effort was best resolved by establishing command at the theater level. Air forces performing a variety of missions could adapt to changing circumstances, operate in mutual support, and mass where appropriate when commanded by an airman.¹⁰ An air commander with a comprehensive theater perspective, a clearly defined operational mission, and effective air forces could establish the pace and conditions for joint and combined campaigns. The operations of the Fifth Air Force in World War II provide a good example of mutually reinforcing air efforts achieving the theater commander's intent and creating favorable circumstances for surface component campaigns (fig. 1).¹¹

While some opposition to the formation of the United States Air Force persisted after the founding National Security Act of 1947, the military need for a service focused on aerospace power was compelling. One of the strongest and most influential advocates of a separate Air Force was Gen Dwight D. Eisenhower, who told the Army staff that the need for coequal air forces "seems to me to be so logical from all of our experiences in this war—such an inescapable conclusion—that I for one can't even entertain any longer any doubt as to its wisdom."¹² Another key advocate was Gen George C. Marshall, who believed postwar United States defense plans should be centered around a strong Air Force, ready to fight at the outset of hostilities.¹³ But the most important evidence arguing for the formation of the Air Force during this crucial period was the emergence of globe-spanning aerospace technologies and threats.

The jet engine, the long-range bomber, the guided missile, and the atomic bomb enforced Gen Henry H. "Hap" Arnold's testimony to the Senate in October 1945.

**COMPOSITE DIAGRAM OF CONTINUOUS DAILY MISSIONS
LAST QUARTER 1944
(TYPICAL)**



Source: The United States Strategic Bombing Survey, Military Analysis Division, *The Fifth Air Force in the War Against Japan*, report no. 71 (Washington, D.C.: Government Printing Office, June 1947), 19.

Figure 1. Typical Daily Missions of Fifth Air Force

The first essential of air power necessary for peace and security is the preeminence in research. . . . We must remember at all times that the degree of national security rapidly declines when reliance is placed on the quantity of existing equipment instead of its quality.¹⁴

Indeed, even before World War II ended, General Arnold tasked Dr. Theodore von Kármán to produce a study, *Toward New Horizons*, to map the future of military aerospace power. Arnold envisioned a continuing need for the Air Force to look 10 to 20 years ahead. The Air Force was “born” looking toward the future.¹⁵

As the United States became a global power and began actively participating in affairs around the world, it created the United States Air Force. While the Air Force is not the only component of national aerospace power, it has been assigned the leading role in developing and fielding forces to conduct and support the core missions of military aviation and space forces for all theaters.

Air Force Aerospace Power in Joint and Combined Warfare

As modern wars have demonstrated, coordinated action by two or more services has significant advantages when large or prolonged use of military force is required. Each service has specific capacities, and the many options provided by each service and their effective combinations provide strategic flexibility. The special capacity of the Air Force, application of aerospace power, has proved to be pivotal in modern warfare.

The degree to which friendly forces control and then exploit the aerospace environment determines the conditions under which joint and combined warfare are fought. Control of the environment is not an end in itself, but an enabling means, a means of creating advantages to pursue strategies and campaigns with an enhanced ability to control the circumstances under which all forces fight.¹⁶ In addition, control and exploitation of the environment are required to affordably *pursue* almost all strategies requiring movement, secure logistics bases, and

apply force. In these and many other senses, aerospace operations of all types have their purpose in joint and combined objectives.

The increased flexibility of all forces gained by attaining control of the air opens up an array of campaign options, and this result has strategic consequences. Allied air supremacy in Desert Storm created conditions that could with equal facility have been exploited by a frontal assault, a flanking attack of almost any magnitude, an airborne insertion almost anywhere, or an amphibious assault—or some combination of the four.¹⁷ Aerospace supremacy thus preserved ambiguity of intent and, with it, strategic maneuverability and surprise for all force types. Aerospace power can not only establish conditions for successful campaigns of joint and combined forces but also can augment those forces by providing combat power to create campaign and battlefield advantages, global movement of important assets, and key force enhancement capabilities.

Forces Designed to Exploit the Aerospace Medium

From its inception, airpower (in its modern form, aerospace power) went beyond the simple concept of exploiting existing technology. Rather than merely taking advantage of the contributions of individual inventions, even early aerospace pioneers underwrote new developments and combined multiple, complex systems into integrated capabilities.¹⁸

Aerospace power has grown steadily in mission capabilities (and in military usefulness) as airmen and manufacturers have developed better aircraft, spacecraft, and key enabling technologies. However, new missions and capabilities have not always been exploited. The development of military aerospace power has often been paced by the ability of military leaders to envision and develop forces that can exploit opportunities for (and minimize the limitations of) operations in the aerospace medium.¹⁹

There have been numerous potential avenues for the development of aerospace power, and choosing the best course to take has required

expertise, study, and vision. Among the most successful efforts to explore emerging opportunities was Project Forecast. In 1963 Gen Curtis E. LeMay ordered “a comprehensive study and analysis of the Air Force structure projected into the 1965–1975 time period” to “exploit technology to achieve distinct strategic advantages.” Although Project Forecast focused on individual technologies, it concluded that “proper combinations of individual advances could provide new generations of flight vehicles with virtually any operational capability that could be desired by a military or a civilian air planner.”²⁰

Just as much of the equipment used in Desert Storm owed its capabilities to Project Forecast, the people who commanded, employed, and supported aerospace forces in that conflict were prepared for their duties by an accumulation of training and experience. Providing professionals with the skills to exploit their mission capabilities requires deliberate development from the most basic instruction to demanding courses that hone expertise. High-quality instruction and continuation training provide combat advantages; training devoted to fully developing wartime skills complements, exploits, and fulfills the investment made in aerospace systems.²¹

Aerospace power depends on numerous specialized skills, all working together to attain its broad purposes. Although specialized training is the foundation for developing individual skills, effective combat operations depend on the kind of flexibility, interaction, and understanding developed in more demanding exercises. Large-scale training efforts, such as the Flag series of exercises, emulate many of the demands of combat in controlled conditions and may involve participating units from sister and allied services.

Aerospace forces must be organized in ways designed to capitalize on the qualities of the people and equipment that comprise them. Finding the best way to organize to follow through on investments in aerospace systems and training is a dynamic search.²² Numerous trade-offs, such as those between mass and flexibility, functional excellence and versatility, and predictability and adaptability,

influence organizational design, but the overall governing goal is mission performance.

Conclusion

Air Force capabilities are the result of decades of development, training, and organizing, all comprising the constant search for the best forms and uses of aerospace power. The devotion of the Air Force to developing aerospace power is necessary not because aerospace power is an end, but because the government and people of the United States have legislated this function and rely on the Air Force to fulfill it.²³

Notes

1. Foreign Broadcast Information Service, "Baghdad Radio Carries CBS Interview with Saddam Hussein," *Near East Summary* 90-170, 31 August 1990, 22. Transcript of Dan Rather's interview with Saddam Hussein on 29 August 1990, translation from Baghdad Domestic Service in Arabic on 30 August 1990.

2. W. Barton Leach, "Obstacles to the Development of American Air Power," *The Annals of the American Academy of Political and Social Science*, May 1955, 67–75, excerpted in Eugene M. Emme, ed., *The Impact of Air Power* (New York: D. Van Nostrand Co., Inc., 1959), 805–13.

3. See especially I. B. Holley Jr., *Ideas and Weapons* (New Haven: Yale University Press, 1953; new imprint, Washington, D.C.: Office of Air Force History, 1983), in particular chap. XI, "Summary and Conclusions," 175–78. Elting E. Morison presents lucid analyses of institutional change in industry and the military, both in *From Know-How to Nowhere: The Development of American Technology* (New York: Basic Books, 1974) and in *Men, Machines and Modern Times* (Cambridge, Mass.: MIT Press, 1966).

4. In 1913 hearings on forming a separate air corps as a line component of the Army, the Assistant Secretary of War told Congress that military aviation was "merely an added means of communication, observation, and reconnaissance" which should be "coordinated with and subordinate to the general service of information and not erected into an independent and uncoordinated service." Robert Frank Futrell, *Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force*, vol. 1, 1907–1960 (Maxwell AFB, Ala.: Air University Press, December 1989), 16–17.

5. The Smuts Committee called for an air arm separate from the older services, concluding that

the time is, however, rapidly approaching when that subordination of the Air Board and the Air Service [to the Army and Navy] can no longer be justified. Essentially the position of an air service is quite different from that of the artillery arm. . . . Artillery could never be used in war except as a weapon in military or naval or air operations. It is a weapon, an instrument ancillary to a service, but could not be an independent service itself. Air Service, on the contrary, can be used as an independent service itself. . . . Unlike artillery, an air fleet can conduct extensive operations far from, and independently of, both Army and Navy. As far as can at present be foreseen, there is absolutely no limit to the scale of its future independent war use.

See “The Second Report of the Prime Minister’s Committee on Air Organization and Home Defence Against Air Raids,” 17 August 1917, digested as “‘Magna Carta’ of British Air Power,” in Emme, 33–37; and quoted in Futrell, 1:27.

6. Futrell, 1:25–27, 63, 103.

7. Quoted in “Unification and Strategy” excerpted from the House Committee on Armed Services report of the same title, in Emme, 639.

8. Futrell, 1:103–4. General Spaatz’s analyses of pre-World War II air operations indicate the need for unified airpower was apparent in the 1930s. See Gen Carl A. Spaatz, “Ethiopia, China, and the Spanish Civil War,” in Emme, 363–67.

9. See, for example, Toshiyuki Yokoi, “Thought on Japan’s Naval Defeat,” in *The Japanese Navy In World War II: In the Words of Former Japanese Naval Officers*, ed. and trans. David C. Evans (Annapolis: Naval Institute Press, 1986).

10. The value of having a competent and visionary airman commanding unified air forces is demonstrated by exceptional results in adverse conditions (e.g., General Kenney) and by negative examples (such as Adolf Hitler). See George C. Kenney, *General Kenney Reports* (New York: Duell, Sloan and Pearce, 1949; new imprint, Washington, D.C.: Office of Air Force History, 1987), covers Kenney’s accomplishments with more enthusiasm than objectivity; the person most appreciative of Kenney’s accomplishments may have been General MacArthur. See Douglas MacArthur, *Reminiscences* (New York: McGraw-Hill, 1964), 157. On Hitler’s misuse of the Luftwaffe, see Williamson Murray, *Strategy for Defeat, The Luftwaffe, 1933–1945* (Maxwell AFB, Ala.: Air University Press, January 1983).

11. Two excellent appreciations by Herman S. Wolk are “MacArthur’s Premier Airman” in *We Shall Return!* (Lexington, Ky.: University Press of Kentucky, 1988) and “The Great Innovator” in *Makers of the United States Air Force*, ed. John L. Frisbee (Washington, D.C.: Government Printing Office, 1987). Fifth Air Force operations are described in United States Strategic Bombing Survey, Military

Analysis Division, *The Fifth Air Force in the War Against Japan*, report no. 71 (Washington, D.C.: Government Printing Office, June 1947).

12. Quoted in Herman S. Wolk, *Planning and Organizing the Postwar Air Force, 1943–1947* (Washington, D.C.: Office of Air Force History, 1984), 97.

13. Futrell, 1:201–2. Of course this was not a new idea. In 1921 Gen William “Billy” Mitchell declared “Aviation must be ready when the war starts. That is when it will have its greatest effect,” 36–37.

14. *Ibid.*, 1:205. These same recent developments in aerospace technology were major themes of General Arnold’s *Third Report of the Commanding General of the Army Air Forces to the Secretary of War* (Baltimore: Schneidereith & Sons, 12 November 1945). In the final section of this report, “Air Power and the Future,” (59–62) Arnold wrote:

Future attack upon the United States may well be without warning, except what may be obtained from an active national intelligence agency. . . . An Air Force is always verging on obsolescence. . . . National safety would be endangered by an Air Force whose doctrines and techniques are tied solely to the equipment and processes of the moment. Present equipment is but a step in progress, and any Air Force which does not keep its doctrines ahead of its equipment, and its vision far into the future, can only delude the nation into a false sense of security.

15. Futrell, 1:205–20; Wolk, *Planning and Organizing the Postwar Air Force 1943–1947*, 40.

16. An early development of the objectives of air control in a theater context is Marshal of the Royal Air Force (then wing commander) J. C. Slessor, *Air Power and Armies* (London: Oxford University Press, 1936). Slessor describes the purposes of air superiority as twofold: “to achieve our own object in the air and to stop the enemy achieving his. . . . It can equally well be said that the object of air superiority is the control of air communications *firstly for our own use* and secondly to deny their use to the enemy (emphasis in original).” Note that exploiting and denying the enemy use of air communications has an extended meaning—control of the “airwaves” as well as the airspace—that describes vital Air Force missions today.

17. The ability of air supremacy to create ambiguity and prepare the conditions for a variety of subsequent joint campaign phases in Desert Storm was perceptively foreshadowed in Trevor N. Dupuy et al., *If War Comes, How to Defeat Saddam Hussein* (McLean, Va.: HERO Books, 1991). In the summation chapter, “The Decision,” Colonel Dupuy explains that the air campaign

is not really an alternative course of action, but rather is seen as a preliminary to all of the four possible alternative ground courses of

action. This course of action might conceivably cause so much damage to the Iraqi military establishment as to bring about a surrender, thus obviating the need for any of the ground courses of action. This, however, is far from certain. (100–101)

While this book is largely oriented on the ground forces' concerns, the chapter on the air campaign (53–61) is extremely insightful.

18. For example, the Wright brothers devoted years to researching bird flight, the experiments of Otto Lilienthal and others, materials, engines, propellers, wing shapes, and kite flying. The Wrights were master craftsmen who synthesized available knowledge and technologies. A good recent account that highlights their multiple talents is Fred Howard, *Wilbur and Orville: A Biography of the Wright Brothers* (New York: Alfred A. Knopf, 1987). As Howard points out, their great original accomplishment was developing three-axis flight controls (and this was the focus of their patent application).

19. As one example, the War Department's General Staff was apparently unable to appreciate contemporary capabilities of airpower when they rejected General Arnold's 1940 proposed organization for war with these words: "The Air Corps believes that its primary purpose is to defeat the enemy air force and execute independent missions against ground targets. Actually, its primary purpose is to assist the ground forces in reaching their objective." Futrell, 1:103.

20. Futrell, *Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force*, vol. 2, 1961–1984, 172, 228–31. Another key finding of Project Forecast was that the idea of a "technological plateau" was a myth—new technology just kept opening up further vistas of new possibilities (229). Some clearer contributions of Project Forecast that were vital to Desert Storm included progress in standoff weapons (410) and the C-5 transport (656).

21. High-quality training has proved to be a military necessity. After the Air Corps Tactical School was closed to meet the demands of expanding the Air Corps in World War II, the Air Staff determined this decision had been shortsighted and created the Army Air Forces School of Applied Tactics. Futrell, 1:133–34. Its successor, the USAF Fighter Weapons School, was founded to improve combat skills in Korea and was a core element of the USAF response to losses in Vietnam. Futrell, 2:295.

22. Recent examples include institutionalizing the joint force air component commander's position to achieve unity of command of aerospace forces at the theater level and development of the composite wing to institutionalize the indivisibility of aerospace forces.

23. For some contemporary views on the role of aerospace power in our nation, see Col Dennis M. Drew, "The Airpower Imperative: Hard Truths for an Uncertain World," *Strategic Review*, Spring 1991, 24–31.