# Employing Aerospace Forces
## The Operational Art

### Introduction

The operational level is one of the most difficult aspects of warfare to understand and practice. This is the level of warfare where national strategy goals are put into definable military objectives for a theater of operations. In a nutshell, operational art is how a land, naval, or air component commander employs the military forces assigned to a theater of operations to achieve the theater commander's objectives as outlined in the overall theater campaign plan.[1] Warfare at the operational level is inherently joint or combined warfare.

### Operational Art

In today's high-technology world, it is almost impossible to imagine a theater of operations where the war is won in a single battle or by a single component. The theater commander is responsible for employing the forces assigned to the theater of operations in the best possible fashion.[2] To use these forces effectively, the theater commander must rely upon the land, naval, and air component commanders to direct their assigned forces to achieve synergy. The individual responsible for the direction of the theater's assigned air and space assets is the air component commander. In appropriate circumstances, aerospace forces may have a tremendous effect on the modern battlefield. However, this potential depends upon the air component commander's ability to exercise operational art, give advice to the theater commander on land and naval component operations, and above all, have an air campaign perspective.[3]

### Command And Control

Air power history contains countless examples proving the absolute necessity for airmen to be responsible for the effective

use of the air weapon. Nevertheless, some military theorists and practitioners do not accept this precept. While no land or naval component commander would argue for having anyone but a land or naval force expert in control of surface forces, land or naval force commanders often will argue there is no need for an air component commander.

What happens when airmen are not in control of aerospace forces? The US Army ignored British experience, "penny-packeted" US air forces out to US ground forces during Operation Torch, and kept them that way until the fateful defeat at Kasserine Pass in 1943. After that lesson was learned (at least temporarily), airmen were put in charge of the air component and allocated air assets to various missions as they saw fit.[4] With this decision, the air commanders could finally concentrate their forces, destroy the Luftwaffe in Tunisia, and by May 1943, acting in concert with ground forces, compel the Afrika Korps to surrender in North Africa. Other examples of such successes abound—Guadacanal, 1942–1944; General Kenney's Southwest Pacific air campaigns; and the Desert Air Force in North Africa, 1941–1942. Most recently, Cable News Network showed the results of concentrated, independent air operations as they reported the Gulf War.

This cursory review of incidents from air power's history clearly shows a successful campaign such as Desert Storm must have an airman in control of aerospace assets. However, control is not the only vital factor. A successful Desert Storm campaign also requires very careful preparation by that same airman.

## Employing Aerospace Forces

Thinking about employing aerospace forces leads to another critical history lesson. The simple fact is no universal formula exists which, if carefully followed, will ensure that aerospace power will be properly employed in an air campaign. A major reason for this fact is that aerospace forces can act in a wide variety of roles and missions in the pursuit of the theater commander's objectives. The Air Force recognizes four basic roles for aerospace forces: aerospace control, force application, force

enhancement, and force support. Although other air forces may use different terms, the roles are basically the same.

The types of missions in which aerospace forces may be used vary even more than the roles. For example, in 1921 the Royal Air Force (RAF), with a combination of armored cars and aircraft (all under RAF command) controlled unruly tribesmen in Iraq.[5] In 1948 air power was employed in a decisive but noncombative role during the Berlin airlift. These are but some of the ways aerospace forces may be used.

The variety of aerospace power roles and missions, combined with its short history (in relation to land and naval forces) and rapidly changing technology, has created a situation in which a nonairman will not have the necessary expertise to employ aerospace forces effectively. Airmen serving as air component commanders must provide this expertise. However, they must not only be expert in the employment of aerospace forces but they also must be, like Gen George C. Kenney, Lord Arthur Tedder, and Air Marshal Sir Arthur ("Mary") Coningham, knowledgeable and prepared to advise the theater commander on ways the land and naval components can operate in concert with the aerospace component to produce the greatest synergy in the air campaign. Although no formula for success exists, several common factors must be considered whenever an air campaign plan is developed.[6]

## Nature of the Enemy

A critical factor to consider in air campaign planning is the nature of the enemy. History shows that if commanders do not carefully think about just who the enemy is, they will likely employ aerospace forces in ways that eventually will set them up for failure. Two classic examples are the failure of the Luftwaffe in the long battle against the Soviet Union in World War II (WWII) and the near failure of the Israeli Air Force during the Yom Kippur War. In both of these situations, the air forces involved failed to understand the nature of their enemy and what their enemy's capabilities were. The Luftwaffe, in a large part, failed because it lacked the capability to attack Soviet

factories beyond the Ural Mountains. The Germans did not plan for the possibility the Soviets would literally move their war production out of the range of the Luftwaffe.[7] The Israeli Air Force nearly failed over the Egyptian bridgehead in the Sinai because the Israelis did not appreciate the effectiveness of the combination of SAM 2 and SAM 6 batteries. The Israelis ultimately had to rely upon land forces to turn the flank of the SAM defenses the Egyptians had deployed.[8]

Of all the aspects of the enemy's nature, the commander's personality and abilities must be primary factors for consideration, since they will dominate the enemy campaign plan and its execution. Success in a campaign will depend on whether planners can understand what the enemy commander is thinking, how he will react, and then, how to get inside his decision loop. The enemy is a living opponent who will not only react but will also initiate his own actions. As an example, even though Desert Storm air campaign planners successfully foresaw many of Saddam's actions, the political impact of his Scud campaign was underestimated and many aerospace assets had to be thrown into "Scud hunts."[9] In addition to the nature of the enemy, a successful orchestration of aerospace forces into a winning campaign also requires a careful consideration of the overall nature of the war.

## Nature of the War

Another factor campaign planners must take into account is the nature of the war they are planning for. This means considering not only Clausewitz's fog and friction but also the specific type of conflict.[10] The British found their successful air control campaigns in the undeveloped regions of Iraq and Aden did not translate into success in the urban regions of Palestine. In a similar fashion, we may hope that American military planners have learned that conventional air campaigns are not particularly successful against such insurgent or guerrilla forces as those we faced in Vietnam.[11] The nature of the war ties directly into yet another factor that can have a tremendous effect on campaign planning—the nature of the theater.

## Nature of the Theater

Although aerospace warfare is three dimensional and is not constrained by natural boundaries or terrain features, its effective employment is nevertheless affected by the physical characteristics of the theater. For example, the RAF found the urban and jungle character of the operational areas limited the effectiveness of air power in Palestine and Malaya, respectively.[12] The effect of weather on even our high-technology war machine was evident during Desert Storm when clouds limited not only bombing but also satellite observation and bomb damage assessment. (One aspect of Desert Storm we must continually remember is that aerospace power is very effective against an enemy in a desert region.) Other physical factors that may restrict aerospace power include location, size, climate, topography, distances from friendly bases, availability of bases and other facilities, and fuel. To some extent, space-based assets can overcome some of these physical restrictions. Thus, to maximize the synergistic effects of an air campaign, planners must evaluate the potential effectiveness of not only air but also space assets.

## Orchestration

Orchestrating aerospace power into a campaign requires an understanding—which only an airman has—of the capabilities and limitations of all aerospace forces (terrestrial and space assets). Increasingly, space forces are performing tasks that used to be done by air-breathing assets. The key to winning is deciding on the combination of air and space assets to provide the greatest synergy.[13] Orchestration is not only the melding of the different types of air and space assets into a coherent air campaign but also the blending of the air campaign into the overall theater campaign. The variety and capabilities of our air and space assets produce a tremendous versatility in aerospace forces.

## Versatility

Technological improvements in precision; stealth; and command, control, communications, computers, and intelligence ($C^4I$) have

contributed immensely to aerospace power. These technological improvements allow attacks across the whole range of target sets simultaneously. Moreover, most of our aircraft are capable of accomplishing a wide variety of missions. Historically, American airmen often focused only on strategic attack and saw this as the way to achieve a decisive result. This attitude limited the effectiveness of aerospace power and produced a distinction between what were referred to as "strategic" and "tactical" aircraft. In reality, as was vividly illustrated by the Desert Storm air campaign, it is the effect of the attack which is either strategic or tactical, and not the type of air or space asset used, the weapon employed, or the target struck.

The versatility of aerospace forces is also shown by their unique ability to respond rapidly to changes in conditions or objectives in the theater. For example, planners were able to shift a wide variety of aerospace assets into Desert Storm's Scud hunts. The Scud attacks are very good examples of the use of what once would have been called a tactical weapon—and in this case, a militarily ineffective one—but whose use during Desert Storm had strategic effects. Consequently, the A-10s, F-15Es, F-16s, and the other aircraft used to chase down and destroy Scuds were performing a mission with strategic effects.[14] Tying together all of these factors into a coherent plan to maximize their contribution to the combatant commander's plan is the essence of operational art.

## Air Campaign Planning

Planning and using aerospace forces to maximize their contribution to the combatant commander's intent is the essence of aerospace operational art. JCS Pub 1-02 defines a campaign plan as "a series of military operations aimed to accomplish a common objective, normally within a given time and space."[15] An effective "air campaign" must be an "aerospace campaign." The air component commander develops an air campaign plan that employs all available theater air and space forces to accomplish or support the objectives the combatant commander has established. These objectives may require various combinations of, and levels of participation by, air,

land, and naval forces. The air campaign plan must be tailored to attain the theater objectives, and it should describe both enemy and friendly centers of gravity, phasing of air and space operations, and the resources needed to achieve these objectives.

Campaign planning allows the air component commander to exercise operational art. The air campaign planning process is broken into five stages which, once combat begins, will occur both simultaneously and sequentially as the plan is adjusted for follow-on operations.[16] Stage one researches the prospective combat environment (including determining what resources are available), stage two defines the aerospace objective, stage three determines the strategy, stage four analyzes centers of gravity, and stage five draws all these factors together into a coherent plan.[17]

The air campaign may be either an independent operation or used in conjunction with surface operations conducted by naval or land component commanders under the overall direction of the theater commander. The air component commander's exercise of operational art involves four tasks. The first is to visualize the theater and decide when, where, and how to apply what forces in concert with the other components to achieve national strategy goals. The next is to develop an air campaign plan to create a situation that will give the other component units their best chance to defeat the enemy on the surface, if that should be necessary. The third is to adjust the campaign plan to take advantage of the results of the campaign and to accommodate the theater commander's revised intent.[18] The last task looks for the chance to exploit those fleeting opportunities resulting from war's friction. The key to victory lies in the air component commander's ability to seamlessly orchestrate the roles and missions of air and space forces to achieve synergy and then blend these roles and missions into the overall theater campaign.

Usually an air campaign will have several phases containing one or more phase objectives. These objectives are accomplished by a mix of roles and missions. This mix varies in every case; there is no set formula for application of aerospace power since no two situations are exactly alike or take place in the same location. The air component commander must decide

the proper blend for the situation during the planning process and how air should be integrated with other component operations. When the enemy has aerospace forces, the air campaign's first priority will normally be to gain and maintain control of the aerospace environment. This is accomplished by offensive and defensive counter air and space operations along with suppression of enemy air defenses. In every case, at least local control of the aerospace environment is a prerequisite for successfully pursuing the campaign's other objectives.[21]

Once friendly forces can operate without facing unacceptable hindrance and risks at the hands of enemy air forces, aerospace operations should focus on neutralizing the enemy's centers of gravity through strategic attack or interdiction. However, close air support may in some instances be the first priority, particularly if it must be done to ensure the survival of ground forces. In such a situation, friendly ground forces are already engaged, facing superior numbers, and in imminent danger of being overwhelmed. With such a situation, the air campaign's primary focus must be on close air support, local air superiority, and interdiction.[19] Other situations may require different reactions to an enemy's initiatives or threats.[20] General MacArthur called General Kenney a "master of air tactics and strategy" largely because Kenney overcame the disadvantages of being outnumbered, fought as circumstances required, and took the air initiative from his opponent.[21]

## Integration

Finally, and most important of all, our aerospace forces must be integrated. Our experiences during WWII, Korea, and Vietnam repeatedly demonstrated the futility of piecemeal "penney packeting" air power. An effective campaign plan must integrate all theater-assigned aerospace forces under the control of a single air component commander. The air component commander is the theater commander's single voice for aerospace power. His main function is to unify and integrate theater aerospace operations in a campaign plan

to achieve the theater commander's objectives. The air component commander must control and then concentrate aerospace forces at decisive points. He must always be an airman.

## Conclusion

The air campaign must effectively use all available assets to support the theater commander's campaign. The air campaign must employ both terrestrial- and space-based assets to gain aerospace control and assure our ability to exploit the aerospace environment. In most, if not all, cases, the air campaign will precede land and naval campaigns since it can make our adversary "deaf and blind" to surface operations.[22]

Aerospace power has the potential to make an immense contribution to winning a war. Taking advantage of this potential, however, requires a comprehensive understanding of war which can only be achieved by studying war intensively from a campaign perspective. Only this perspective can reveal how and why aerospace power can make such large contributions to the effectiveness of surface forces. Just as importantly, it also shows how and why surface forces are often the key to making aerospace forces more effective. Only an airman, well versed in aerospace operational art, can effectively decide when, where, and how to use aerospace forces in a campaign.

### Notes

1. Besides the amount of knowledge it requires, the effective exercise of operational art also differs from tactics in that it demands a degree of imagination, judgment, and moral courage far exceeding that needed to win battles. These differences explain why so few successful tacticians are able to fight successful campaigns. See Carl von Clausewitz *On War*, ed. and trans. by Michael E. Howard and Peter Paret (Princeton, N.J.: Princeton University Press, 1984), 100–112; see also Clayton R. Newell, *The Framework of Operational Warfare* (New York: Routledge, 1991).

2. Gen William E. DePuy, "Concepts of Operation: The Heart of Command, The Tool of Doctrine," *Army*, August 1988, 26–40.

> The commander's concept is his supreme contribution to the prospect of victory on the battlefield whether he is at the tactical or operational level. Without a sound and dominating concept of operation, no amount of command presence, personal flair, years of rectitude, demonstrated integrity, advanced degrees, perfectly managed assignments, warrior spirit, personal courage, weapons proficiency or troop morale can hope to compensate.

3. There is a host of material on the application of operational art and operational planning. Perhaps three of the best examples of airmen exercising operational art are Gen George C. Kenney in the Southwest Pacific, 1941–1942; Air Marshal Lord Arthur Tedder and his deputy, Air Marshal Sir Arthur Coningham, and the Desert Air Force, 1941–1943; and the Cactus Air Force on Guadacanal Island in the Solomons Campaign, 1942–1944. In all three of these situations, the airmen responsible showed tremendous vision, campaign/theater perspective, and ingenuity, and above all, they were airmen in charge of air power. For the details, see Lawrence Cortesi, *Operation Bismarck Sea* (Canoga Park, Calif.: Major Books, 1977); Gen George C. Kenney, *General Kenney Reports* (Washington, D.C.: Office of Air Force History, 1987); Vincent Orange, *Coningham* (Washington, D.C.: Center for Air Force History, 1992); Lord Tedder, *With Prejudice: The War Memoirs of Marshal of the Royal Air Force Lord Tedder, GCB* (London: Cassell, 1960); and Thomas G. Miller, Jr., *The Cactus Air Force* (New York: Harper & Row, 1969).

4. On 21 July 1943, the War Department issued War Department Field Manual (FM) 100-20, *Command and Employment of Air Power*. This manual made land and air forces co-equal and interdependent. Neither would be an auxiliary of the other. It also put an airman in command of the air forces in a theater of operations and made him responsible only to the theater commander.

5. See Sir John Bagot Glubb, *War in the Desert: An RAF Frontier Campaign* (London: Hodder & Stoughton, 1960); David E. Omissi, *Air Power and Colonial Control: The RAF 1919–1939* (New York: St. Martin's Press, 1990); or Anthony Robinson, ed., *Aerial Warfare* (London: Orbis Publishing Limited, 1982).

6. The notion of a paradigm for the air campaign planning process was elucidated by Col John Warden III in *The Air Campaign: Planning for Combat* (Washington, D.C.: NDU Press, 1988) and was developed into a concise model in the August 1992 *JFACC Primer*. Although both are excellent guides for planning an air campaign, neither was designed to be used by someone who does not have expertise in the subject of air power. They are no different than the many similar manuals and guides used by surface force commanders to guide them in planning the employment of ground or naval forces. In all three cases—air, land, or naval

forces—the component commander must have expertise to be able to employ these forces in the most efficient manner.

7. For an excellent analysis of the Eastern Front air war, see Richard Muller, *The German Air War in Russia*, (Baltimore: The Nautical & Aviation Publishing Company of America, 1992).

8. See Bekker; Galland; and Ehud Yonay, *No Margin for Error: The Making of the Israeli Air Force* (New York: Pantheon Books, 1993). All three are replete with examples of just how badly an overconfident force can underestimate its enemy and the almost certain failure which results.

9. For details of the Scud hunts from the A-10 perspective, see William L. Smallwood, *Warthog: Flying the A-10 in the Gulf War* (McLean, Va.: Brassey's, 1993).

An excellent example of getting inside your enemy's decision loop, although fictitious, is found in the movie *Patton*, starring George C. Scott as Gen George Patton, Jr. Watching his forces destroy an attack by the Afrika Korps, General Patton remarks: "Rommel, you magnificent bastard, I read your book!" In fact, General Patton was one of the eminent military historians of his time and was constantly reading military history, doctrine, and tactics. He actually learned how Field Marshal Erwin Rommel thought by reading Rommel's tactics book, *Attacks*. Simply put, Patton got inside the Desert Fox's decision loop because he knew how Rommel would likely act in a situation. Other examples of commanders whose personality dominated the campaign for good or evil include General Schwarzkopf, Field Marshal Slim, T. E. Lawrence, General Wingate, Lord Tedder, General LeMay, Air Vice Marshal Coningham, General Kenney, Adolf Hitler, Reichmarshal Goering, or Field Marshal Montgomery—the list is all but endless. See Russell F. Weigley, *Eisenhower's Lieutenants* (Bloomington, Ind.: Indiana University Press, 1981); Martin Blumenson, *The Patton Papers 1885–1940* (Boston: Houghton Mifflin Co., 1972); Kenney; or Galland.

For a discussion of how important it is for a commander to understand both the enemy's objective and his determination to achieve the objective, see Mark Clodfelter, *The Limits of Air Power: The American Bombing of North Vietnam* (New York: Free Press, 1989).

10. Types of conflict range from urban insurgent war through insurgent operations in jungle or mountainous terrain to large-scale operations in a European or desert setting.

11. See Philip Anthony Towle, *Pilots and Rebels: The Use of Aircraft in Unconventional Warfare* (Washington, D.C.: Brassey's, 1989) and Clodfelter.

12. See Towle.

13. Desert Storm was America's first comprehensive space war. Space-based assets provided weather information, reliable navigation support, warning, and secure, rapid communications. See Air Force White Paper, *Air Force Performance*

*in Desert Storm* (Washington, D.C.: Department of the Air Force, April 1991), 10–11. Also, Mark D. Campen, ed., *The First Information War* (Fairfax, Va.: AFCEA International Press, 1992). The latter is a collection of essays of varying quality mainly concerned with command, control, and communications in the Gulf War. The essays do provide valuable insight into satellites and their contributions, communication support, and what an information war is. Space-based forces provide these enhancements to the air campaign:

> 1. Threat warning/attack assessment (TW/AA)—detect and track ballistic missile launches, detect, track, assess air-breathing threats.
> 2. Surveillance—detect man-made disturbances (e.g. buried facilities), locate presurveyed launch locations, provide route and target information for mission planning, detect camouflage (man-made soft disturbances), assess enemy movements and operations, and provide warning of hostile acts and reconnaissance against US assets.
> 3. Navigation—provide common navigation grid, provide common timing reference (GPS), provide position, location, and velocity for weapon accuracy and ingress/egress, provide position, location, and time for navigation, and provide silent rendezvous coordination.
> 4. Environmental Support—provide data for fallout patterns, intensity and aerosol dispersion, provide wind and cloud data in enemy areas for weapons selection, monitor ionospheric disturbances which affect $C^4I$, provide weather data over route and target, provide soil moisture and snow cover data for trafficability, and provide MSI data for maps and analysis.
> 5. Communications—provide raw data to assessment centers, provide assessed information to key decision makers, provide warning to forces, provide secure, survivable communications capability, provide tasking to forces, provide inter- and intra-theater communications capabilities, provide assessed information and data to forces, and provide timely situational awareness and location information to forces.

Draft AFM 2-25, *Space Operations Doctrine*, 23–24.

14. Smallwood, 91–99.

15. Joint Pub 1-02, *Department of Defense Dictionary of Military and Associated Terms* (1 December 1989), 60.

16. Both simultaneously and sequentially simply put means a campaign plan is not cast in concrete when the air tasking order is transmitted. Air campaign planning is an ongoing process that takes about 36 hours from start to finish. Thus, once the shooting begins, combat research begins again as soon as battle damage assessments are available. Within three days, three "campaign plans" will be operating at once, in various stages of development and execution, all aimed at achieving the

combatant commander's objectives. See the *JFACC Primer*, Deputy Chief of Staff, Plans and Operations, HQ USAF, August 1992, for an excellent detailed description.

17. See *JFACC Primer*. This pamphlet outlines current thinking on the air campaign concept. Currently, the air component commander (ACC) is the single point of control for aerospace power in a theater of operations. The ACC is the theater airspace control authority, is the area air defense commander, and has the responsibility of tasking forces to accomplish the objectives assigned by the joint forces commander (JFC). Also the ACC is responsible for making the air asset apportionment recommendation to the JFC.

The JFC determines and assigns the total expected air effort by percentage and/or the priority that should be devoted to the various air operations or by geographic areas for a specified time period, with advice from the ACC. This is the apportionment decision from which the ACC allocates—or decides the numbers of sorties by aircraft type/location available for each operation/task. The ACC also makes a distribution decision which is a part of the allocation process that decides how many sorties will be earmarked for close air support and distributed among the various land maneuver units by the land component commander.

18. See Gen Michael J. Dugan, "Airpower: Concentration, Responsiveness, and the Operational Art," *Military Review*, July 1989, 15–16, or Col Dennis M. Drew, "Desert Storm as a Symbol: Implications of the Air War in the Desert," *Air Clues* 47, no. 2 (February 1993), 47–48.

19. This was the precise situation facing US and South Korean forces in the early weeks of the Korean War. The FEAF blunted the North Korean invasion, giving the allied forces the opportunity to establish the Pusan perimeter. For the details, see Robert F. Futrell, *The United States Air Force in Korea: 1950–1953*, rev. ed. (Washington, D.C.: Office of Air Force History, 1983).

20. Some examples include the Gulf War's battle for Khafgi, the air power response during the Battle of the Bulge in 1944, or the response at Khe Sanh.

21. *JFACC Primer*, 17–18.

22. Iraqi ignorance of the move by the main part of the Desert Storm ground forces to the west before the start of the ground war is one of the best examples of just how well aerospace power can blind an enemy.

# Essays on Air and Space Power

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