

Airpower in the Korean War

The North Korean People's Army (NKPA) invasion of the Republic of Korea (ROK) on 25 June 1950 found US armed forces in a deplorable condition with little conventional capability.¹ The newly established United States Air Force (USAF) had spent most of its limited budget on strategic nuclear systems, neglecting the tactical air forces. The Far East Air Forces (FEAF) based in Japan and its Fifth Air Force had conducted few joint exercises to practice air-ground coordination with the Eighth US Army in Korea (EUSAK).² Within a month the NKPA drove the United Nations (UN) forces to a small perimeter around the port of Pusan. Despite the unprepared condition of the tactical air forces, air power prevented disaster and complete defeat of the UN forces during the initial NKPA invasion. Lt Gen Walton H. Walker, the commander of EUSAK at the start of the war, stated, "If it had not been for the air support that we received from the Fifth Air Force, we should not have been able to stay in Korea."³ While the USAF was a major factor in helping to ensure the independence of South Korea, there were numerous errors committed by the US forces, including the Air Force, that resulted in ineffective application of air power.

War is a complex endeavor, and the problems encountered are often interrelated. For example, the failure to develop a true joint theater command structure in Korea not only contributed to other problems but also inhibited the development of solutions to the problems. Additionally problems in air-ground coordination led to degraded close air support (CAS), and Air Force-Navy coordination remained difficult through most of the war. A true joint staff could have assisted in the resolution of these problems.

Air interdiction had an important role in the war but was not always used effectively. Finally, the USAF lost flexibility in employing its new jet aircraft when it ran into problems with the availability of air bases that had long, concrete runways for these aircraft.

At the root of air power's difficulties during the Korean War was the command structure of the Far East Command (FEC) of Gen

Douglas MacArthur, commander in chief, Far East (CINCFE). In the words of the official USAF history:

The Korean war was the first conflict to test the unified military forces of the United States. Although the U.S. Joint Chiefs of Staff had directed the Far East Command to provide itself with a joint command staff adequate to ensure that the joint commander was fully cognizant of the capabilities, limitations, and most effective utilization of all the forces under his command, the United Nations Command/Far East Command operated for the first two and one-half years of the Korean war without a joint headquarters. Practically all of the interservice problems which arose during the Korean war could be traced to misunderstandings which, in all likelihood, would never have arisen from the deliberations of a joint staff. In the absence of the joint headquarters staff, the full force of United Nations air power was seldom effectively applied against hostile target systems in Korea.⁴

One of the lessons of World War II was the need for a joint command structure for command of a theater. A joint headquarters, with expertise from all the services, oversees the subordinate ground, air, and naval components, ensuring the most efficient, coordinated, and synchronized employment of the theater commander's resources.⁵

In Korea, the command structure greatly hindered the coordination of joint forces and communication between forces. A typical failure was in air targeting. Instead of having FEAF, the air component command, perform air targeting, GHQ formed the GHQ Target Group and tried to direct air operations from Tokyo.⁶ The Target Group, made up of GHQ staff officers, "lacked the experience and depth of knowledge for targeting an air force. . . . [T]he [Target Group] effort was inadequate."⁷ As an example, 20 percent of the first 220 targets designated were nonexistent, such as the rail bridges at Yongwol and Machari—two towns without railroads at all.⁸ A GHQ target selection committee, which included high-level USAF and US Navy personnel, was formed to improve targeting. The GHQ committee improved performance but was dependent on the FEAF Formal Target Committee, with Navy, Fifth Air Force, and Far East Bomber Command representatives providing expert targeting. This FEAF committee did not get full authority for air targeting until the summer

of 1952, two years into the war.⁹ The overall effect was the failure to fully integrate air power into the theater campaign.

Another result of GHQ interference was the hindrance of Eighth Army requests for air support early in the war. GHQ directed the ground forces not to contact Fifth Air Force for air support but rather to send all requests through GHQ in Tokyo. This procedure entailed long and ponderous communications links from EUSAK to GHQ to FEAF and finally to Fifth Air Force. As a result, in the early phases of the war it took about four hours to channel requests for air support from Eighth Army to Fifth Air Force, a major factor inhibiting prompt and effective air support.¹⁰

In a review of the command structure after taking over as CINCFE in the spring of 1952, Gen Mark W. Clark recognized the poor organization of the Far East Command. He formed and activated Army Forces Far East (AFFE), the ground component command, in October 1952, and it began functioning in January 1953. While General Clark formed a true joint staff at FEC, which was an important improvement, he still took over as CINCAFFE, continuing as commander of both the theater and GCC.¹¹

The Air Force also experienced major problems in air-ground coordination and CAS. Although lack of a true joint command structure contributed to these problems, major Air Force and Army shortcomings were primary causes. Entering the war, FEAF's primary mission was the air defense of the Far East, especially Japan. It had conducted minimal and unrealistic training in CAS with the Eighth Army.¹²

Initially, FEAF had only rudimentary tactical air control capabilities. It sent two tactical air control parties (TACP) to Korea immediately to support the ROK troops, but these were inadequately equipped and not well trained. The old, worn-out, jeep-mounted radios of World War II vintage—unable to take the beating of the rough terrain—were constantly breaking down and were difficult to repair. The TACPs were often unable to get to the front lines with working equipment, and, if they did, their unarmored jeeps and radios were extremely vulnerable to enemy fire. The result was an inability

to get far enough forward to direct effective air strikes.¹³ Additionally, the Army had failed to develop adequate communication nets for tactical air requests and liaison, forcing the Army to use (and to overload) the Air Force tactical air direction network.¹⁴ The sum total of these problems was a ploddingly slow network that inhibited rapid response to immediate needs for CAS.

The total inadequacy of tactical air-ground coordination and the initially permissive air environment led FEAF to equip T-6 aircraft as airborne tactical air coordinators (called Mosquitoes).¹⁵ These Mosquitoes, along with such steps as assigning TACPs to every regiment and setting up a tactical air control net for Eighth Army, improved Air Force CAS. Because such slow, unarmed aircraft are very vulnerable in a high-threat environment, the improved Chinese defenses forced FEAF to restrict the Mosquitoes to within two miles of friendly lines by the summer of 1951.¹⁶ Additionally, the very limited radios of the Mosquitoes quickly led to saturation under heavy usage.

Although the tactical air control system was improved significantly, its continuing deficiencies were masked by the decreasing importance of CAS due to the improved organic firepower of the ground forces and the change from a fluid war of maneuver to a static front in the second six months of the war,¹⁷ a condition that lasted the rest of the war. FEAF shifted its emphasis to air interdiction but continued to provide CAS; however, even with the static ground environment, CAS was not very responsive. In September 1951, the Marines, now integrated into Eighth Army, and without their own organic air support, were involved in the heaviest fighting on the front. FEAF supported their need for CAS with an average response time of 113 minutes.¹⁸

Overall, the Army and Air Force failed to find a satisfactory way to provide timely response and frontline control of air strikes.¹⁹ This was finally revealed in the last months of the war, when the Chinese mounted one last offensive and the Army needed CAS. The official Navy history noted that

the close support request net clogged almost at once . . . strikes followed requests by as much as 17 hours. Again . . . the control system collapsed as JOC [Fifth Air Force Joint Operations Center] duty officers . . . rammed aircraft in large numbers into the threatened sectors. Once more . . . the main responsibility [was put on] the Mosquitos [*sic*] which, in the fluid situation, once more demonstrated their inability to keep track of friendly positions and important targets.²⁰

Clearly the ability to respond rapidly to emergency needs for CAS was never established in Korea.

The Army entered the war with a piecemeal commitment of light infantry against an NKPA invasion backed by significant armor forces equipped with the powerful T-34 tank. Normally, the Army uses organic artillery and armor to provide close-in firepower, but it entered Korea with few tanks and inadequate infantry and artillery antitank rounds, having viewed Korea as unsuitable terrain for tanks. Additionally, the ROK army was lightly armed, more a police force than an army.²¹ Although a buildup of artillery and armor was rapidly made, the initial use of light infantry against the armored NKPA forces in the first months of the war led to the need for heavy air support.

Besides being unable to stand up to armor, the UN forces were consistently outmaneuvered in the fluid situation as the NKPA drove down the Korean peninsula. The tendency of US forces to deploy near the roads and not take the high ground aided the enemy in their typical offensive tactic of envelopment or double envelopment, cutting off the rear lines of communication, disrupting the rear areas, and often overrunning the artillery. In the first six months of the war, US artillery was repeatedly overrun, with “scandalous” losses of field pieces.²² This added to the heavy dependence on CAS for firepower.

Close air support was undoubtedly an important factor early in the war, as evidenced by the comments of Maj Gen William Kean, commander of the US 25th Division, after two days of heavy fighting in September 1950: “The close air support rendered by Fifth Air Force again saved this division as they have many times before.”²³ The official Army history also noted that

in the first month of the Korean War, close air support was a vital factor in preventing the North Koreans from overrunning all Korea, and in gaining for the United States the margin of time necessary to bring in reinforcements and accumulate the supplies needed to organize the Pusan Perimeter . . . the U.N. ground forces in Korea were receiving proportionately more air support than had General Bradley's Twelfth Army Group in World War II.²⁴

It should be noted that this "close air support" included what was also known as battlefield air interdiction (BAI). Indeed, most tanks killed by air power were destroyed by BAI sorties, not CAS.²⁵

The problems of air-ground coordination in the Korean War were compounded by the inability of FEAF to adequately communicate and coordinate with naval (including Marine) aviation. Although routine interservice problems were easily handled, doctrinal clashes over control of tactical air power between USAF and naval aviation were not solved in Korea.²⁶ Again, the lack of a joint command structure contributed to these problems and the failure to completely resolve them.

The Marines, in their amphibious role, were essentially light infantry and lacked adequate organic artillery and armor. Their doctrine specified a dependence on CAS to within 50–200 yards. The Army preferred artillery for very close support and usually used CAS farther from troops (beyond 1,000 yards), where ground controllers were of limited use. In contrast to the prewar relationship between FEAF and Eighth Army, Navy-Marine aviation trained extensively and realistically with the Marine ground units. This resulted in very effective Marine air-ground coordination and CAS, with dependence on the Navy and FEAF for air superiority.²⁷ It seems no coincidence that captured enemy troops said they most feared, "the blue airplanes" of the Navy and Marines.²⁸

Of course, the Marines had a major advantage in that their brigade (eventually a division) had its own dedicated Marine air wing, a concept too cost-prohibitive for the much larger theater forces of the Air Force and Army. This dedicated air support assumes air superiority and a limited geographical front, with no requirement to rapidly concentrate air power in other areas of the theater. These

factors led to the Marines having aircraft on air alert for 5- to 10-minute response, while the Air Force required aircraft to be on call, with typical response times of 40 minutes.²⁹ Still, trouble did not start until the Navy ran into the FEAF air-ground control network. The need to check in with the Fifth Air Force Joint Operations Center (JOC) in Taegu forced aircraft to fly within 10 or 15 miles of the JOC for assignment to a controller, adding as much as 200 extra miles to sorties. This greatly limited options and time on station.³⁰

Additionally, the Air Force 4- and 8-channel VHF radios on the T-6 did not have adequate capacity, especially compared with the better Navy 12- and 20-channel sets.³¹ Two of the T-6 channels were set to ground party frequencies, leaving two (or at best six) frequencies for working air control. When a real need arose, JOC would swamp the sector, leaving the T-6s and their few radio channels overloaded. Because of the limited frequencies and multiple flights, TACPs and Mosquitoes would often all be on the same channel, causing great confusion and inefficiency.³² An action report from the aircraft carrier USS *Philippine Sea* provides an example:

For this vessel the subject of close support is a touchy one. The inability to establish good communications with any controllers has limited its effectiveness. There is apparently no such thing as radio discipline. If a pilot has something to say he just tries to cut out whoever is on the air. Too many tactical air controllers and different support flights are on the same channels. With the present ground situation as it is [that is, fluid] it is mandatory that the pilots be informed exactly as to their mission. In the past this has not been done and has resulted in inefficient use of aircraft from this vessel engaged in close support operations.³³

Compounding the situation, the poor payload and lack of loiter time of FEAF's Japan-based F-80s often forced Navy aircraft to hold while the F-80s made their runs. Many times the Navy aircraft could not even make contact with the Mosquitoes. Navy captain John Thatch "just couldn't believe that communications could be so bad [that] the pilots would come back and say 'We couldn't help. We wanted to, we were there and we couldn't get in communication with people.'"³⁴

The question of unified command of all theater air power remained an Air Force-Navy issue throughout the war. Lt Gen George E. Stratemeyer, commander of FEAF, insisted on operational control of all naval aircraft operating out of Japan or flying over Korea. The Navy, however, although mainly supporting the theater ground forces in Korea, also had responsibility for control of the sea, sea lines of communication, fleet defense, and the defense of Formosa. In light of these responsibilities, the Navy was not willing to subordinate its air resources to an air component commander. Rather than being under the operational control of the theater commander, the Navy saw itself in a supporting role.³⁵ This fundamental doctrinal difference on control of theater air power never was satisfactorily resolved during the war, although an acceptable working relationship was finally established.³⁶

General Stratemeyer felt that to coordinate carrier and FEAF operations over Korea, he needed to control naval air operations, “including the targets to be hit and the area in which they operate.”³⁷ When Adm C. Turner Joy, commander of Naval Forces in the Far East (ComNavFE), objected, Stratemeyer clarified that by *control* he meant “the authority to designate the type of mission, such as air defense, close support of ground forces, etc., and to specify the operational details such as targets, times over targets, degree of effort, etc., within the capabilities of the forces involved.”³⁸ Again, he stressed that to get the most out of air power resources, FEAF needed operational control of all FEAF and NavFE air resources to ensure deconfliction of targets and effective coordination of all air efforts. The Navy still did not agree, but in an 11 July 1950 meeting, an agreement was made for FEAF to have *coordination control* over Navy air—a new term with different meanings to the Air Force and Navy.³⁹ The Navy believed its air component had to support the sea campaign first. Although in Korea there was virtually no battle for the sea, there was significant concern over a communist invasion of Formosa, for which the Navy was responsible. It interpreted the term *coordination control* as fitting its supporting force role and did not accept it as meaning that naval air forces were under operational

control of the air component command. While this arrangement may satisfy short contingency operations, it hampered the long-term theater campaign.⁴⁰

To solve the coordination problem, NavFE requested and was given exclusive areas of operation for Navy air close to the east coast of Korea, where the carriers operated. This limitation of naval air power to a geographical area eliminated the capability to mass firepower at the most critical points in the theater and caused loss of flexibility in applying maximum air power on the most important targets.

Part of the problem in integrating naval air into the theater air battle was the large amount of communications required by the large, centralized FEAF system. Carriers had limited communications capabilities, often under radio silences, and were unable to handle high-volume FEAF communications.⁴¹ One example of the incompatibility of the high-volume Air Force communications with the limited Navy capacity was a FEAF radio message in November 1950 that gave the air plan for one day. Sent to the carrier task force, it required more than 30 man-hours to process.⁴²

These problems were partially a result of the bitter “unification” battles that resulted in the National Security Act of 1947. In the end, the Air Force had “won” complete responsibility for air interdiction. As a result, the Navy had no plans to use its air in long-term land campaigns.⁴³ The lack of training for interdiction and the major differences in employing CAS hindered coordination and cooperation between the Navy and Air Force. As a result of the interservice disputes after World War II, the Navy had a deep-seated distrust of the Air Force. It did not always make an effort to cooperate with FEAF even when FEAF was eager to work jointly.⁴⁴ Ultimately both services must share in the blame for their failure to work together.

As the war progressed, Air Force-Navy cooperation did improve significantly. Cooperation was greatly aided by improved Navy representation at both the Fifth Air Force Joint Operations Center and the FEAF Targeting Committee, both of which became solid joint operations.⁴⁵ Nonetheless, fundamental differences, especially in the control of air resources, were never completely worked out.

The Korean War had some unique factors that affected air interdiction (AI), including terrain and the Chinese sanctuary. It also provides examples of effective and ineffective air interdiction, demonstrating the importance of integrating AI efforts into the overall theater campaign.

Korea favors air interdiction, being a 400-nautical-mile-long peninsula varying in width from about 100 to about 300 nautical miles. It is extremely mountainous, resulting in more than 85 percent of the terrain being unsuitable for vehicles. At the time of the war, traffic was concentrated on the few roads and railroads of the existing network. The depth of most rivers varies from deep (between March and September) to fordable at other times. During winter many rivers (including the Yalu) freeze over.⁴⁶

An important factor affecting interdiction was the sanctuary the UN extended to Chinese territory, allowing buildup of vehicles and supplies in China. Additionally, the communist soldiers needed few supplies by US standards; and they were able to use manpower to carry supplies and to implement such effective countermeasures as using camouflage, restricting travel to night, and deploying repair teams for rails, roads, and bridges.⁴⁷ Finally, the static front that developed and the reduced need for ground maneuver limited the effectiveness of interdiction.

Initially, as UN forces retreated to establish the Pusan perimeter, FEAF began conducting air interdiction to cut the lengthening NKPA supply lines. In combination with long lines of communication and heavy ground fighting, interdiction greatly reduced the fighting capability of the NKPA and resulted in extreme shortages of men and virtually all supplies.⁴⁸ The bombing of bridges is usually emphasized in this AI campaign, but AI in the form of armed reconnaissance, usually by naval and FEAF fighter-bombers, had the major impact. Fighters roamed the roads and rails, looking for lucrative targets and strafing and rocketing trains and convoys. For example, on 10 July 1950, an F-80 discovered a convoy backed up behind a downed bridge and called in additional air. A combination of F-80s, F-82s, and B-26s destroyed 117 trucks, 38 tanks, and 7 half-tracks and killed numerous

soldiers.⁴⁹ From the enemy soldier's viewpoint, the effect was devastating. One prisoner described such an attack: "En route from Kwangung area the 8th [NKPA] division was attacked many times by aircraft and lost ten 76-mm field guns, three 122-mm howitzers, 20 tanks, and 50 trucks loaded with ammunition and equipment."⁵⁰ Such events were similar to the experiences of World War II, such as at Normandy, when armed reconnaissance by fighter-bombers was effective in interdicting enemy ground forces en route to the battlefield in what is now called battlefield air interdiction.⁵¹ However, interdiction alone did not lead to victory. It was the combination of this continual air interdiction with ground maneuver (the Inchon landing), and ground offensives (the Eighth Army's breakout from Pusan) that resulted in the rout and destruction of the NKPA.⁵² This theater-level integration of interdiction into the campaign was the key to success.

Besides helping destroy the NKPA, air interdiction made another significant contribution to the UN effort. When the Chinese Communist Forces (CCF) intervened in the war late in November 1950, the restrictions on CCF maneuver created by interdiction allowed Eighth Army to break clear and retreat to prepared defenses. For nearly three weeks, the Eighth Army was out of contact while AI sorties hammered the CCF.⁵³

Throughout the war, AI forced the enemy to travel at night, limiting his maneuver, the distance he could travel, and the availability of his supplies, thus reducing the CCF's capability to mount or sustain offensives.⁵⁴ Nevertheless, air interdiction made a significant contribution to victory only when it was combined with maneuver of ground forces as an integral part of the theater campaign.

Despite these successes, the Air Force and Army demonstrated their incomplete understanding of AI by conducting Operation Strangle in isolation from significant ground maneuver over a period of 10 months from August 1951 to May 1952. The operation was a systematic attempt to cut off the enemy in the front lines from their supplies through the sustained exercise of air interdiction. Strangle followed a road-interdiction effort in conjunction with an Eighth Army

offensive in the summer of 1951. Initially successful, the road-interdiction efforts faded in effectiveness as the offensive reached its objectives and halted. Looking for more effective targets, FEAF developed a plan to destroy the enemy railroad system. They believed that this interdiction campaign “would so weaken the enemy that he could easily be routed by an Eighth Army ground offensive or he would be forced voluntarily to withdraw his troops closer to the Manchurian border in order to shorten his supply lines.”⁵⁵ It soon became obvious that these expectations were unrealistic.⁵⁶ This effort demonstrated an incomplete understanding of air interdiction, since the UN was unwilling to commit the ground forces (and take the casualties) needed to maneuver and take the offensive—key elements in integrating air interdiction into a theater campaign.⁵⁷ The USAF official history notes: “As was the case in World War II, the best time for an interdiction campaign was when the ground situation was fluid, the fighting intense, and the enemy’s logistical needs were greatest.”⁵⁸

The problems that hindered the effective use of air power by the fledgling United States Air Force in the Korean War should lead us to reflect on what might go wrong in a future war and to ask questions about our capabilities today.

In one key area, the organization of joint commands, Korea clearly demonstrated that a theater commander must properly organize and staff his command structure. The failure to do so will result in inefficiency and inability to harness the synergistic effects of well-coordinated ground, air, and naval forces.

From an Air Force perspective, the key to jointness is for all theater staff air officers to understand the application of air power in depth, and to understand the basic nature of naval, space, and land warfare. Above all, they should understand that war is not won by air, space, land, or sea power alone but by the synergistic efforts of highly coordinated joint forces. To create synergies, all officers must have the in-depth understanding that only comes from studying the history of war.

Korea provides a good example of the importance of integrating air interdiction efforts into the overall theater campaign and maneuver

of ground forces. Any misunderstanding of how air interdiction fits into a theater campaign can lead to further vain efforts such as attempting to shut down the Ho Chi Minh trail or current attempts to interdict drug traffic. Air interdiction does, indeed, make its contribution by either destroying enemy forces or delaying and disrupting their movement; however, for either effect to contribute fully to the successful outcome of a campaign, air interdiction and ground maneuver must be synchronized so that each complements and reinforces the other. Synchronization is important because it can create a dilemma for the enemy that has no satisfactory answer. His dilemma is this: If he attempts to counter ground maneuver by moving rapidly, he exposes himself to unacceptable losses from air interdiction; yet if he employs measures that are effective at reducing losses caused by air interdiction, he cannot maneuver fast enough to counter the ground component of the campaign. Thus, regardless of the action the enemy chooses to take, he faces defeat.⁵⁹

When the Korean War opened, the US military had limited conventional capabilities. Air power was crucial in the early days of the war in preventing the total defeat of UN forces. Nonetheless, numerous problems resulted in less than optimal application of the available air resources. Problems with the joint command structure, air-ground coordination, Air Force-Navy cooperation, air interdiction, and air base availability all give us some insight into similar issues today. Peacetime is the time to ensure that we will not be caught with similar problems again.

Notes

1. For an overview of the deterioration of US military capabilities following World War II, see chapter 1 of Clay Blair's *The Forgotten War: America in Korea 1950–1953* (New York: Times Books, 1988), 290. Blair states, "By June 25, 1950, Harry Truman and Louis Johnson had all but wrecked the conventional military forces of the United States."

2. Russell F. Weigley, *The American Way of War: A History of United States Military Strategy and Policy* (Bloomington: Indiana University Press, 1977), 384.

3. *Ibid.*, 384–85.

4. Robert F. Futrell, *The United States Air Force in Korea 1950–1953*, revised edition (Washington, D.C.: Office of Air Force History, 1983), 693.
5. William B. Reed, ed., *Condensed Analysis of the Ninth Air Force in the European Theater of Operations* (1946; new imprint, Washington, D.C.: Office of Air Force History, 1984), 96–97.
6. Futrell, 45.
7. William W. Momyer, *Airpower in Three Wars* (Washington, D.C.: Government Printing Office, 1978), 54.
8. Futrell, 52.
9. Momyer, 54.
10. Futrell, 45.
11. *Ibid.*, 490–91.
12. *Ibid.*, 2, 61.
13. *Ibid.*, 80.
14. *Ibid.*, 107–8.
15. *Ibid.*, 80–83.
16. *Ibid.*, 463.
17. James A. Field, Jr., *History of United States Naval Operations in Korea* (Washington, D.C.: Government Printing Office, 1962), 393.
18. Futrell, 465–68.
19. *Ibid.*, 707–8.
20. Field, 455.
21. Blair, 44, 57, 61, 77–78. For an account of the inadequacy of the troops and equipment of the initial deployment of US forces to Korea, see Blair, chapter 4.
22. *Ibid.*, 576. Throughout his book, Blair recounts numerous instances of UN forces being outmaneuvered and losing significant amounts of artillery and equipment in the first six months of the war.
23. Roy E. Appleman, *South to the Naktong, North to the Yalu* (Washington, D.C.: Center of Military History, 1961), 476.
24. *Ibid.*, 256.
25. Edmund Dews and Felix Kozaczka, *Air Interdiction: Lessons from Past Campaigns* (Santa Monica, Calif.: Rand, September 1981), 59.
26. Field, 385.
27. Richard P. Hallion, *The Naval Air War in Korea* (Baltimore, Md.: Nautical & Aviation Publishing Co., 1986), 42–46.
28. *Ibid.*, 50
29. Futrell, 120–23.
30. Field, 390.
31. Hallion, 44–45.
32. Field, 389–91, 455.
33. Hallion, 45.

34. Ibid., 45–46.
35. Momyer, 51–59.
36. Field, 385, 393; Momyer, 51–59.
37. Futrell, 49.
38. Ibid., 50.
39. Ibid.
40. Momyer, 57–59. Momyer makes the point that “the support arrangement is essentially tailored for a highly planned operation of a few days. In a brief operation the support relationship may effectively harmonize the efforts of two or more forces. However, large operations extending over a long time require the more dependable, authoritative relationship of operational control or command. Thus with naval forces committed to the continuing air campaign in Korea, and with no threat from an opposing fleet, FEAF’s argument for operational control made sense” (pages 89–99). Essentially the same problem arose in Vietnam with the same inadequate solution.
41. Futrell, 49.
42. Field, 387.
43. Ibid., ii, 1.
44. Ibid., 392–93.
45. Field, 393; Momyer, 59.
46. Dews and Kozaczka, 43.
47. Ibid., 58.
48. Blair, 239.
49. Futrell, 91.
50. Ibid., 175.
51. Reed, 24.
52. Futrell, 700–701; Weigley, 387.
53. Futrell, 261.
54. Gregory A. Carter, *Some Historical Notes on Air Interdiction in Korea* (Santa Monica, Calif.: Rand, 1966), 5; Futrell, 171; Momyer, 170.
55. Futrell, 440–41.
56. For a complete account of Operation Strangle, see Futrell, chapter 14.
57. Blair, 931. Blair notes that “an all-out Eighth Army attack to the Korean waist under existing conditions [stalemate in June 1951] would almost certainly incur a prohibitive cost in American casualties. Even a limited advance (5, 10, or 20 miles) to improve the Army’s defensive posture, disrupt a possible CCF counterattack, or gain an edge in the possible cease-fire arrangement would not be worth the cost in American blood.”
58. Futrell, 704.
59. Price T. Bingham, “Ground Maneuver and Air Interdiction in the Operational Art,” *Parameters*, March 1989, 16–31.