

North Vietnamese war effort. Armed reconnaissance kept the numbers up. It delivered the ordnance, racked up the sortie rates and flying hours, but it did not contribute significantly either to the ground war in the South or to persuading North Vietnam. Given the political considerations that were uppermost in the minds of President Johnson and his advisers, it's unlikely that any application of air power would have worked.

GENERAL WESTMORELAND AND CONTROL OF THE AIR WAR

by

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Airpower, both fixed and rotary wing, profoundly affected the way in which the United States fought the Vietnam war -- whether for good or ill is still a matter of debate. The availability of airborne fire support, of air transport for troops and cargo, and of aerial reconnaissance permitted Military Assistance Command, Vietnam (MACV) to carry out ground operations otherwise impossible and to occupy and hold positions otherwise untenable. In addition, until the final years of American involvement in the conflict, airpower was the principal, if not the sole, means the United States was willing to use to strike at North Vietnam and to attack enemy bases and lines of communication in nominally neutral Laos and Cambodia.¹

General William C. Westmoreland, throughout his tenure as COMUSMACV, viewed airpower as a key weapon in his effort to defeat enemy forces in South Vietnam. In June 1965, as Viet Cong main force attacks on the Army of the Republic of Vietnam (ARVN) were becoming more frequent and deadly, Westmoreland declared that "air capabilities . . . constitute the current difference between keeping the V. C. buildup under reasonable control and letting the enemy get away from us throughout most of the countryside."²

Westmoreland's campaign in South Vietnam, however, was only one of three air wars being waged simultaneously over Southeast Asia by the end of 1965. The other two were the bombing offensive against North Vietnam, codenamed Rolling Thunder, and a cluster of overt and clandestine operations in Laos aimed at harassing the Ho Chi Minh Trail and bolstering the wavering fortunes of Souvanna Phouma's regime. These campaigns competed with that in South Vietnam for a theater pool of American

airpower that was controlled and allocated by Westmoreland's immediate superior, Admiral Ulysses S. Grant Sharp, CINCPAC.

These wars were carried on by several air forces tied together by a complex, convoluted set of command relationships. United States and Vietnamese Air Force (VNAF) units in South Vietnam operated essentially as a single pool of aircraft under the control and coordination of the Seventh Air Force, MACV's Air Force component command. However, the large 1st Marine Aircraft Wing flew its missions under operational control of the III Marine Amphibious Force (III MAF), the corps equivalent headquarters that directed U.S. ground forces in the northernmost portion of South Vietnam. The Army's thousands of helicopters likewise were outside the Air Force control system. Further complicating the situation, the B-52 force upon which MACV relied to break up enemy troop concentrations and base areas remained under operational control of the Strategic Air Command, although it received its targets from MACV. Finally, the Navy carrier planes that flew missions over North Vietnam and Laos and the Air Force jets based in Thailand were controlled respectively by Admiral Sharp's Navy and Air Force component commanders, CINCPACFLT and CINPACAF.

Direction of the three air wars likewise was divided. Westmoreland, as COMUSMACV, essentially ran air operations within South Vietnam, using the Commanding General, Seventh Air Force, as his Deputy COMUSMACV for Air; he shared direction of the bombing campaigns in Laos with the American Ambassador in Vientiane. However, Admiral Sharp, under close supervision from Washington, conducted the air war against North Vietnam, employing as necessary planes from all the various air forces. Under this arrangement, the Seventh Air Force commander simultaneously served two masters. He provided planes for Rolling Thunder under direction of CINCPAC through CINPACAF while at the same time supporting allied forces in South Vietnam under General Westmoreland.

These arrangements were made necessary by international

diplomatic considerations and service doctrine. The Johnson administration insisted that the wars in Laos and South Vietnam, while militarily closely related, be treated as separate conflicts with separate command arrangements. Thai political sensitivities forced the separation of the American military commands in South Vietnam and Thailand and prevented use of Thai-based U.S. aircraft in South Vietnam, but not in Laos and North Vietnam. The Strategic Air Command refused to place its B-52 nuclear bombers under theater command. Admiral Sharp retained a string on all his airplanes in Southeast Asia so as to be able to respond rapidly to other contingencies in his large sphere of responsibility. Within South Vietnam, the Army and Marines both stubbornly held on to their organic air forces, which they regarded as integral elements of their respective combined-arms teams. They rejected Air Force arguments that theater airpower could function at full efficiency and effectiveness only under unified Air Force direction. The services waged their arguments over air command and control with considerable intensity, not only because of the merits of the issues in the Vietnam conflicts, but because of the likelihood that the results in Vietnam would set precedents for future joint operations.³

General Westmoreland's objectives with regard to airpower were simple: to obtain as much of it as possible to support his ground operations within South Vietnam, and to influence the air wars in Laos and North Vietnam for the purpose of interdicting enemy reinforcements and supplies to the south. Westmoreland's priorities at times conflicted with those of Admiral Sharp. Sharp regarded Rolling Thunder as having equal importance to air operations in South Vietnam and believed that COMUSMACV on occasion overstated his support requirements. Sharp declared after the war that Westmoreland always wanted "to get the absolute maximum of ordnance dropped on every objective he could find," some of which, in Sharp's opinion, "could just barely be justified." Westmoreland, nevertheless, had Secretary of Defense Robert S. McNamara on his side. The Defense Secretary, from the

start of the major American force commitment in 1965, consistently favored priority for South Vietnam in the allocation of air resources, a position only reinforced by his increasing doubts about the effectiveness of Rolling Thunder. Admiral Sharp had no choice but to comply.⁴

From the start of serious consideration of escalation, Westmoreland was skeptical of the proposition that bombing North Vietnam would weaken the enemy he faced in the South. Nevertheless, Westmoreland made repeated bids to control the raids on the North. He suggested to Sharp as early as August 1964, after the Tonkin Gulf reprisals, that his headquarters act as CINCPAC's agent in directing out-of-country air operations, claiming that MACV was in the best position to nominate targets, plan strikes, and coordinate the forces involved. He repeated this suggestion again in March 1965, after the Flaming Dart reprisals that preceded the opening of Rolling Thunder. In each case, Sharp emphatically rejected Westmoreland's proposals. In March 1966, after strong representations from Westmoreland, Sharp did turn over to COMUSMACV direction of strikes in Route Package I, the portion of North Vietnam immediately above the Demilitarized Zone, on grounds that this area had become for all practical purposes an extension of the southern battlefield. However, later in the year he rebuffed Westmoreland's bid to extend his control farther north into Route Package II.⁵

In return for Sharp's concessions, Westmoreland, apparently partly as a genuine convert, partly out of loyalty to Sharp and Chairman of the Joint Chiefs of Staff General Earl G. Wheeler, and partly from a desire to maximize all pressure on the enemy, supported Rolling Thunder during the growing public and intra-administration debate over its value. With Sharp and Wheeler at times almost literally feeding him his lines, Westmoreland regularly produced briefings and reports that detailed how Rolling Thunder allegedly was contributing to the campaign in South Vietnam. Even in supporting Rolling Thunder, nevertheless, Westmoreland emphasized its importance in assisting the struggle

in South Vietnam rather than its merits as an independent air operation.⁶

In contrast to his attitude toward Rolling Thunder, Westmoreland placed great stock in air operations against the Ho Chi Minh Trail network in Laos. He employed MACV's SOG (Studies and Observation Group) reconnaissance teams primarily to target air strikes against the trail, and he sought in vain permission to launch major ground offensives into the Laotian panhandle. Westmoreland, as CINCPAC's coordinator of air operations over Laos, planned and executed strikes. However, the American Ambassador to Vientiane, William Sullivan, possessed veto power over SOG cross-border activities, target selection, and in some instances the types of aircraft and ordnance used.

At frequent meetings with Sullivan at Udorn, Thailand, and through appeals to Sharp and Wheeler, Westmoreland persistently sought greater freedom of action in Laos, both for his SOG teams and for aircraft, and permission to employ every weapon, including napalm and CS gas. Sullivan, while sympathetic to MACV's requirements, was concerned both with preserving the facade of Laotian neutrality and with safeguarding the operations of the Royal Laotian Army and CIA-supported tribal irregulars directed by the embassy. He only gradually expanded Westmoreland's strike authority; and he rejected absolutely all suggestions from COMUSMACV that he step aside from case-by-case review of MACV's plans. Sullivan declared at one point that divided authority over the Laotian air war could end only if the President either gave Sullivan command of MACSOG or appointed Westmoreland Ambassador to Laos. In spite of the inherent tension of their situation, Westmoreland and Sullivan maintained a civil working relationship, enlivened by occasional badinage about Sullivan's pretensions as a "field marshal." Over time Westmoreland gained increasing scope for air and ground action, including employment of B-52s, although never the untrammelled operational discretion he desired.⁷

Within South Vietnam, Westmoreland had an almost completely

free hand in employing airpower, although he had to obtain Admiral Sharp's concurrence in his command and control arrangements and negotiate with Sharp for employment in the South of aircraft from Navy carriers. Westmoreland, in making his air command arrangements, also had to thread his way through conflicting service interests and doctrines. His solutions, while they served his purposes as theater command, did not fully satisfy the contending services.

General Westmoreland viewed the conflict in the South as essentially a ground war, and very largely an Army one, with airpower playing a supporting, albeit vital role, necessitating its tight control by COMUSMACV. Consistent with this view, he persistently resisted Air Force demands for increased high-level MACV staff representation, notably for the post of Deputy COMUSMACV. Throughout Westmoreland's tenure, indeed throughout Military Assistance Command's existence, the Army dominated MACV headquarters, both in numbers of personnel and control of key slots. Only two general staff sections, the J-5 (Plans), and the J-6 (Communications-Electronics) had Air Force chiefs. The best the Air Force could obtain, after much JCS pressure on Westmoreland, was the double-hatting of the Commanding General, Seventh Air Force as COMUSMACV's Deputy for Air. Air Force officers found their limited representation at MACV especially frustrating because MACV retained control of most strike targeting, for both in-country aircraft and B-52s, rather than delegating it to Seventh Air Force.⁸

The degree of control that the Deputy for Air should exercise over non-Air Force aircraft was an even more bitter bone of contention. Commanders of the Seventh Air Force, especially the forceful, articulate General William M. Momyer (1966-1968), with strong backing from their service superiors in Washington, argued that they should have operational control over all fixed-wing aircraft based in South Vietnam. This issue, during Westmoreland's tenure, was primarily an Air Force-Marine Corps one, since the Air Force, under the Johnson-McConnell agreement

of April 1966, had given up its earlier claim to control Army helicopters in return for Army transfer of its fixed-wing transports to the Air Force. The Marines held to their own doctrine that their 1st Marine Aircraft Wing, as part of an air-ground team, should remain outside the Air Force control system and under operational control of the Commanding General, III MAF.⁹

Until early 1968 Westmoreland, with the backing of Admiral Sharp, essentially accommodated the Marines. He left the Marine air wing under III MAF, with the proviso that the Marines' fixed-wing aircraft would be under Seventh Air Force for air defense purposes and that the wing daily would make available for assignment by Seventh Air Force any fixed-wing sorties not needed for support of Marine operations. Westmoreland and Sharp adopted this compromise in order to avoid what they knew would be a bruising doctrinal battle with the Marine Corps and because, as long as only Marine units were deployed in I Corps, the division of command had little adverse practical effect on support of ground operations.¹⁰

The introduction of Army divisions into I Corps during 1967 and early 1968 led Westmoreland to change his position. To ensure adequate air support of the Army units, as well as effective coordination of the massive air effort in support of Khe Sanh, Westmoreland in March 1968 adopted a so-called "single management" system. Under it, General Momyer, as Westmoreland's air deputy, gained operational control, called "mission direction," of the Marines' fixed-wing strike and reconnaissance aircraft. Westmoreland justified this action with the claim that III MAF and the 1st Marine Aircraft Wing had not been sufficiently responsive to Army requests for air support in I Corps. However, the move also resulted from determined lobbying by Momyer and from Westmoreland's general doubts of the ability of III MAF headquarters to control increasingly complex joint operations.

Westmoreland's decision, endorsed after initial hesitation

by Admiral Sharp, produced the predicted interservice battle. The Marines carried their protests all the way to the Joint Chiefs of Staff. Passions on all sides ran high; Westmoreland later claimed this was the only issue during his tenure as COMUSMACV over which he had been ready to resign if he did not get his way. In the end, over Navy and Marine Corps opposition, the Joint Chiefs and Secretary McNamara upheld single management. However, after Westmoreland and Momyer left Vietnam, the Marines succeeded in "outmanaging" the system so as to get most of their aircraft back, de facto if not de jure.¹¹

By the time Westmoreland imposed single management, MACV had brought its many air forces together into a tactical instrument of great power and responsiveness, as the successful air support of the Marine base at Khe Sanh amply demonstrated. Westmoreland clearly did an effective job of defending his interests as COMUSMACV on issues of command and control of airpower. To the frustration of any Air Force leaders, he kept control of key air-related functions in his Army-dominated MACV staff. On questions of service doctrine, Westmoreland was flexible and conciliatory, as shown by his handling of the Marines, until service interests appeared to him to be in conflict with the provision of support to his forces. Then he was prepared to override the services -- or, in the case of single management, to adopt one service's position over that of another. Westmoreland maintained satisfactory working relations with Admiral Sharp and Ambassador Sullivan, so as to minimize the military ill effects of politically mandated divided command and secure maximum influence over air operations on the immediate approaches to his theater. Whatever the merits of Westmoreland's overall strategy for fighting the war, he displayed considerable skill at organizational maneuver and enjoyed substantial success in controlling airpower as an instrument of that strategy.

Endnotes

1. For a comprehensive analysis of the impact of airpower on the war in South Vietnam, see Donald J. Mrozek, Airpower and the Ground War in Vietnam (Washington: Pergamon-Brassey's, 1989). The air campaign against North Vietnam undergoes critical review in Mark Clodfelter, The Limits of Airpower: The American Bombing of North Vietnam (New York: The Free Press, 1989).
2. Msg, Westmoreland to Admiral U. S. G. Sharp (MAC 3052), dtd 110745Z June 65, Westmoreland Msg Files, 1 Apr - 30 June 65, in William C. Westmoreland Papers, U.S. Army Center of Military History (CMH); hereafter Westmoreland Msg Files. Unless otherwise noted, the essay is based on material in the Westmoreland Msg Files and in his History Backup Files (HBF), also in the Westmoreland Papers, CMH, for the period 1965 through 1968.
3. The divided control of air is well summarized in John Schlight, The War in South Vietnam: The Years of the Offensive, 1965-1968 (Washington: Office of Air Force History, 1988), pp. 129-130; hereafter Schlight, Years of the Offensive.
4. Westmoreland clearly states his air priorities in Msg to Sharp (MAC 3052), dtd 110745Z June 65, Westmoreland Msg Files, 1 Apr - 30 June 65. Quotation is from Admiral U. S. Grant Sharp, Reminiscences of Admiral U.S. Grant Sharp, USN (Ret.) (2v. Tnscrip of Intvws by Commander Etta Belle Kitchen, USN (Ret.) for Oral History Program, U.S. Naval Institute, 20 Sept 69 - 7 Jun 70), pp. 369-370; hereafter Sharp Intvw. Schlight Years of the Offensive, pp. 32-33, recounts the setting of air priorities.
5. Westmoreland's views on bombing the North are summarized in General William C. Westmoreland, A Soldier Reports (Garden City, NY: Doubleday and Co., 1976), pp. 105-106, 109-113; and in Sharp Intvw, p. 370. Robert F. Futrell, The United States Air Force in Southeast Asia: The Advisory Years to 1965 (Washington: Office of Air Force History, 1981). p. 232. Msgs, Westmoreland to Wheeler and Sharp (MAC 1061 and 2027), dtd 010650Z Mar 65 and 121140Z Apr 65; Westmoreland to Sharp (MAC 2165 and 2275), dtd 171210Z and 220220Z Mar 66; Sharp to Westmoreland, dtd 262350Z and 262351Z Mar 66; Westmoreland Msg Files, 1 Jan - 31 Mar 65, 1 Apr - 30 June 65, 1 Jan - 31 Mar 66.
6. For an example of Westmoreland's support for Rolling Thunder, see Msgs, Wheeler to Westmoreland (CJCS 1594-67), dtd 012229Z Mar 67; Westmoreland to Wheeler (MAC 2086), dtd 022052Z Mar 67; and Westmoreland to Wheeler and Sharp (MAC 2102), dtd 030512Z Mar 67; Westmoreland Msg Files, 1 Jan - 31 Mar 67.
7. Ambassador Sullivan's direction of the war in Laos is summarized in Charles A. Stevenson, The End of Nowhere: American

Policy toward Laos since 1954 (Boston: Beacon Press, 1972), pp. 208-218. SOG operations are covered in unclassified form in Westmoreland, A Soldier Reports, pp. 107-109; and Brigadier General Donald D. Blackburn, Interview by Senior Officers Oral History Program, U.S. Army Military History Institute (MHI), Carlisle Barracks, PA, 1983, pp. 347-351, 362. For typical examples of Westmoreland's meetings with Sullivan, see Tab C-1, Westmoreland HBF no. 3 (20 Dec 65 - 29 Jan 66); Tab E, HBF no. 8 (17 July - 17 Sept 66); and Tab B, HBF no. 17 (1-31 May 67). Also Msg, Westmoreland to Sharp info Wheeler (MAC 2054), dtd 131145Z Mar 66, Westmoreland Msg Files, 1 Jan - 31 Mar 66.

8. For Air Force complaints about MACV staff representation, see Schligh, Years of the Offensive, pp. 76-77, 126-127; and Ltr, Lieutenant General J. H. Moore, USAF, to Westmoreland, subj: Air Force Representation on MACV Staff, dtd 8 Oct 65, Tab F-7, HBF no. 1 (29 Aug - 24 Oct 65). For an example of Westmoreland's justification of Army predominance, see Msg to Wheeler info Sharp (Mac 5387), dtd 29 Oct 65, Westmoreland Msg Files, 1 Oct - 31 Dec 65.

9. The Marine-Air Force argument is conveniently summarized in Schligh, Years of the Offensive, pp. 110-111. For the Johnson McConnell agreement, see Lieutenant General John J. Tolson, Airmobility 1961-1971 (Washington: Department of the Army, 1973), pp. 104-107.

10. Jack Shulimson and Major Charles M. Johnson, USMC, U.S. Marines in Vietnam: The Landing and the Buildup, 1965 (Washington: History and Museums Division, Headquarters U.S. Marine Corps, 1978), pp. 151-152, outlines the terms of the compromise. For an example of MACV's rationale for it, see Memo, Major General William E. DePuy to Westmoreland, subj: Tactical Air Control, dtd 3 Mar 66, William E. DePuy Papers, MHI.

11. Westmoreland, A Soldier Report. pp. 342-344, tells his side of the controversy. Sharp Intvw, pp. 641-649, gives the CINCPAC view. For a Marine's view of Momyers's role, see Lieutenant General John R. Chaisson, USMC, Oral History Transcript, Washington: History and Museums Division, HQUSMC, 1975, pp. 235-236. The story of the Marine's erosion of the system is recounted in Graham A. Cosmas and Lieutenant Colonel Terrence P. Murray, USMC, U.S. Marines in Vietnam: Vietnamization and Redeployment, 1970-1971 (Washington: History and Museums Division, Headquarters U.S. Marine Corps, 1986), pp. 273-279.

OPERATION NIAGARA
AIR POWER AND THE SIEGE OF KHE SANH

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If I may resort to a cliché -- the phrase find, fix, and finish -- Operation Niagara represented an attempt to find and fix the enemy using ground forces and then finish him with aerial bombing and artillery. ". . . I gave it the code name Niagara," says the memoir of General William C. Westmoreland, "to invoke an image of cascading bombs and shells."¹ The sparsely populated region around the Khe Sanh combat base in the northwestern corner of South Vietnam served as the site of Operation Niagara. Located near the village of Khe Sanh, the combat base sat atop a large hill mass that dominated a major highway leading into southern Laos and the enemy's north-south infiltration route, the Ho Chi Minh Trail. In late 1967 and the early weeks of 1968, Westmoreland was thinking of using Khe Sanh as the jumping-off place for an attack against the Ho Chi Minh Trail like that launched in 1971 by South Vietnamese troops.²

Finding the enemy proved to be no problem for the architects of Operation Niagara; indeed, scarcely had the Marines established themselves at Khe Sanh and made improvements to the airstrip, when the North Vietnamese appeared. Before the year 1967 ended, American intelligence detected signs that North Vietnamese forces were moving southward toward the Demilitarized Zone and Khe Sanh. Skirmishing began early in January 1968, and on the 20th a North Vietnamese officer, angered at being passed over for promotion, deserted and warned that his former comrades would attack the base and its outposts that very night. As he predicted, infantry tried unsuccessfully to overwhelm the outpost on hill 861, northwest of the base, and occupied Khe Sanh village to the west, while artillery fire destroyed stockpiled fuel and

ammunition at the base itself. Westmoreland seized the opportunity and directed his deputy commander for air, Air Force General William W. Momyer, to execute Operation Niagara. To fix the North Vietnamese so that the cascade of high explosive would have the deadliest effect, Lieutenant General Robert E. Cushman, Jr., the commanding general of the Marines in northern South Vietnam, reinforced the Khe Sanh garrison to a strength of about 6,000, flying in an additional Marine battalion on January 22 and a battalion of South Vietnamese rangers five days later.³

The tactics chosen for the defense of Khe Sanh were not new. In the fall of 1967, air strikes and counterbattery fire all but silenced the North Vietnamese artillery shelling the Marine combat bases at Con Thien and Gio Linh, northeast of Khe Sanh, nearer the South China Sea. General Momyer, who commanded the Seventh Air Force besides serving as Westmoreland's deputy for air, had already coined an acronym, SLAM, standing for Seek, Locate, Annihilate, and Monitor, to describe the use of ground and aerial reconnaissance and firepower to find, fix, and finish an enemy.

The B-52 bomber emerged as the key component in Momyer's SLAM concept, for this huge aircraft could carry as many as 108 500-pound bombs internally and on racks under the wings. A cell of three B-52s could saturate with high explosive an area measuring one by two kilometers, but the very size of the target box created a safety problem, even though the bombers released their loads on signal from a radar operator on the ground. At Con Thien planners imposed a safety margin of three kilometers between the impact area and friendly troops. Despite the reliance on radar, one of the B-52s in action there dropped its bombs within the safety zone, where they exploded about 1.4 kilometers from the Marine bunkers, shaking the defenders, without causing injury, but detonating ammunition the enemy had stockpiled. This error demonstrated that the B-52s could bomb much closer than three kilometers without undue danger to friendly forces and that doing so was worthwhile, since the enemy

was taking advantage of the safety zone to push his men and weapons forward and stock them with ammunition. During Operation Niagara, target boxes only one kilometer from the Khe Sanh combat base erupted suddenly, as bombs dropped from 25,000 feet, far beyond the reach of the available AAA, exploded on target.⁴

In terms of tonnage dropped and spectacular explosions, the B-52s made the greatest contribution to Operation Niagara. Before the eyes of the Marines at Khe Sanh, an entire tract one kilometer wide and two kilometers in length would dissolve in geysers of earth and smoke as the bombs detonated. Neither flesh nor steel, it seemed, could survive such a battering. The huge bombers dropped more than 59,000 tons of high explosive out of the 98,000 tons of bombs and 160,000 artillery shells that deluged the enemy.⁵ Westmoreland credited the B-52s with making a critical contribution; indeed, he told the men of the 3d Air Division, who maintained and flew the bombers, that "the thing that broke their backs was basically the fire of the B-52s."⁶

This tribute to the B-52s should not, however, obscure the fact that fighter-bombers and attack aircraft of the Air Force, Navy, and Marine Corps combined to deliver the balance of the torrent of bombs, some 39,000 tons. If the B-52s served as Westmoreland's battle-ax, these smaller aircraft were his rapier. They thrust at compact targets too close to the combat base or its outposts for the use of B-52s; they suppressed enemy fire to enable transports to land at the Khe Sanh airstrip and helicopters to resupply the outposts; and, sometimes after dropping their bombs, they provided combat air patrols in the event North Vietnamese fighters should try to intervene.⁷

Since so much of the devastation, especially by B-52s, took place in areas that Marine patrols could not penetrate, aerial photographs produced most of the information used to assess the effect of the bombing and shelling. Largely on the basis of collapsed trenches, damaged artillery pieces, and demolished bunkers, Westmoreland's intelligence specialists credited Operation Niagara with killing or wounding 10,000 NVA, a total

that represents little more than an educated guess.⁸

The camera also helped locate targets for air strikes or artillery; however, in the selection of targets, electronic sensors demonstrated their value in an operation for which they were not really intended. The initial plan called for them to detect North Vietnamese infiltration by road and trail into South Vietnam and report the enemy's movement to an infiltration surveillance center at Nakhon Phanom, Thailand, which would call for air strikes. Instead, the sensors now kept watch beyond the hills and ridges around Khe Sanh and reported through the surveillance center to a fire support coordination center at the base. Some 250 of the electronic devices, dropped by aircraft, monitored the routes the enemy was likely to use. Pebble-sized mines detonated when stepped on and triggered the individual sensors to broadcast a signal to the surveillance center, where analysts interpreted the data and alerted the combat base to patterns of hostile activity.⁹

The massive use of firepower that constituted Operation Niagara tended to overshadow the role of transports and helicopters, usually escorted by fighter-bombers or attack aircraft, in supplying the Khe Sanh Combat Base and its outposts. Lockheed C-130s and Fairchild C-123Ks of the Air Force delivered more than 4,000 tons of cargo and 2,600 persons to Khe Sanh and carried out some 1,500 passengers, including 306 wounded men. In addition, the C-130s parachuted another 8,000 tons of cargo to the defenders. Marine helicopters hauled 4,600 tons of cargo and 14,500 passengers, usually on shuttle flights to and from the hilltop outposts.¹⁰

Operation Neutralize, the attack on the North Vietnamese batteries shelling Con Thien and other Marine Corps outposts south of the Demilitarized Zone, provided a precedent for the massing of air power and artillery in defense of a base, and the operation also foreshadowed the problems of coordinating these weapons within a confined space, as at Khe Sanh. During Neutralize, to minimize the danger of collision between Air Force