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War from above the Clouds

B-52 Operations during the Second Indochina War and the Effects of the Air War on Theory and Doctrine

William P. Head, PhD

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B-52 Operations during the Second Indochina War and the Effects of the Air War on Theory and Doctrine

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Foreword

Dr. William P. Head's *War from above the Clouds: B-52 Operations during the Second Indochina War and the Effects of the Air War on Theory and Doctrine* is an examination of B-52 operations in Vietnam and how the air war affected airpower doctrine and theory. His study examines the evolution of this awesome manned strategic weapon in Vietnam to see how the design of the B-52s originally intended mission altered—if at all—the theories of airpower first put forward by Giulio Douhet and William "Billy" Mitchell. Dr. Head also analyzes how this same operational alteration affected official United States Air Force (USAF) doctrine first formulated by Army Air Corps and Army Air Forces leaders before and during World War II—later modified in the 1950s after the USAF became a separate service.

In the aftermath of World War II, airmen had to reevaluate the old theories. Would the bombers always get through? The lessons of the war seemed to indicate that the answer to this question was no, not without long-range fighter escorts such as the P-47 and P-51. Airpower leaders also rightly noted that bombing technology and the quantity of bombers had not been sufficient in World War II to allow airpower to be decisive. Dr. Head contends that the lack of a definitive test for the theory that airpower decisively affects the outcome of war continued during the Vietnam or Second Indochina War.

Dr. Head initially conducted his research for a shorter presentation at the Air Force's Fiftieth Anniversary Conference in Washington, D.C., during the summer of 1997. Air University Press is pleased to present the expanded essay—*War from above the Clouds: B-52 Operations during the Second Indochina War and the Effects of the Air War on Theory and Doctrine*—as a Fairchild Paper.

Shirley Brooks Laseter

SHIRLEY BROOKS LASETER
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and Southwest, and *Who's Who in the World*. Dr. Head contributed numerous articles to the 1999 ABC–Clio *Encyclopedia of the Vietnam War*, the 2000 ABC–Clio *Encyclopedia of the Korean War* and the *Encyclopedia of Aerial Warfare*, as well as the forthcoming ABC–Clio *Encyclopedia of Naval Warfare* and Facts On File *Encyclopedia of Military History*.

Introduction

This paper examines the B-52 Stratofortress operations in Vietnam and how the air war affected airpower doctrine and theory. It also examines the evolution of this awesome-manned strategic weapon in Vietnam to see how the structure of the B-52's originally intended mission altered—if at all—the theories of airpower first put forward by Giulio Douhet and William "Billy" Mitchell. This paper analyzes how this same operational alteration affected official United States Air Force (USAF) doctrine first formulated by Army Air Corps and Army Air Forces (AAF) leaders before and during World War II and later modified in the 1950s after the USAF became a separate service. In defining airpower doctrine, Dr. Dennis M. Drew asserts that "doctrine has many functions, but it can adequately be defined as a 'framework for understanding how to apply military power. It is what history has taught us works in war, as well as what does not.'"[1]

The 1992 Air Force Manual (AFMAN 1-1), *Basic Aerospace Doctrine of the United States Air Force,* defines Air Force doctrine as "what we have learned about aerospace power and its application since the dawn of powered flight." It also states that Air Force doctrine is "a broad conceptual basis for our understanding of war, human nature, and aerospace power." The manual declares that doctrine is "the starting point for solving contemporary problems."[2]

The September 1997 document—which appeared in late 1997—reaffirmed these points and the growing emphasis in the USAF on combat in space.[3] In the very first chapter it states, "Air and space doctrine is a statement of officially sanctioned beliefs and warfighting principles that describe and guide the proper use of air and space forces in military operations."[4] This document emphasizes that "air and space doctrine is an accumulation of knowledge gained primarily from the study and analysis of experience, which may include actual combat or contingency operations as well as equipment tests or exercises."[5] At the same time, this document declares, "it must be emphasized that doctrine development is never complete."[6] Dr. Drew concludes that "although doctrine may

not fulfill all of the requirements of a formal academic definition of theory, it fulfills most of the same functions and in that sense forms a 'poor man's' theory of airpower."[7]

These definitions and their core components are not completely new. Following World War I, two airpower prophets—Douhet and Mitchell—wrote and spoke extensively on how airplanes should be used in war and how they would become the new primary military weapon. Douhet in *The Command of the Air* and Mitchell in *Winged Defense* and *Our Air Force* called on their nations to develop separate military air services and build vast armadas of bombers and fighters designed to take the war beyond the battlefront to the enemy's heartland. These theories—born out of a desire to avoid a repeat of the bloody and costly trench and ground combat of World War I—hypothesized

B-52D Dropping a Load on the Enemy

B-52Ds—referred to as Big Bellies—played a major role in the Arc Light, Commando Hunt, Linebacker operations in Southeast Asia from 1965 to 1973. This version of the Stratofortress was decommissioned after the war, and it was placed at Andersen AFB, Guam, as a memorial to all B-52 crew personnel who lost their lives.

that it was possible for a powerful fleet of bombers to attack and destroy the enemy's industry, infrastructure, civilian morale, and socioeconomic leadership, thus leaving the armies in the field to wither and die. In doing so, the only need for ground forces was for air base defense and "mopping up" since, in this "perfect world theory," enough bombers would always get through to destroy the targets necessary to force the enemy—unwilling to suffer any further domestic hardship and destruction—to sue for peace.[8]

Since the 1920s, these theories of airpower have seen an extensive maturation process. In the 1930s and 1940s, the Air Corps and USAAF sought status as an independent service by arguing that they could be and later were a decisive force in winning World War II. In the postwar era the independent USAF became the strategic umbrella under which all other national defense policies were sheltered. In Korea and Vietnam the USAF believed it could have been a core component of victory by being a dominating factor on and beyond the battlefield. Since Vietnam, actions in the Persian Gulf, Bosnia, and Kosovo have apparently proven that—supported by appropriate weapons and technology—the current airpower theory and doctrine mentioned above is indeed the major component of modern military success.

In 1999 President William Jefferson "Bill" Clinton and our European allies in the North Atlantic Treaty Organization (NATO) assumed the validity of this distilled theory by employing their air forces to pressure Serbian leadership to end genocide in the former Yugoslavian province of Kosovo. This time the matured theories actually worked and even those who had once decried the modern emphasis on airpower were left to applaud. For example, on 6 June 1999, the noted British military historian, John Keegan wrote: "Now there is a new turning point [in military history] to fix on the calendar: June 3, 1999, when the capitulation of President [Slobodan] Milosevic proved that a war can be won by airpower alone."[9]

Prior to the Persian Gulf War, in the sum total of human history, not even powerful industrial nations such as the United States had had the ability or opportunity to realize this dream. World War II witnessed enormous numbers of Allied heavy

bomber strikes against German and Japanese industrial and civilian targets, daylight precision attacks, and nighttime urban-saturation fire-bombing raids. While these attacks brought great destruction upon the enemy and afforded the Allies air supremacy in support of land and sea operations, they did not fully realize the "Douhetian dream" of winning a war with minimal use of ground and sea forces. What airpower successes in World War II did achieve was to lead American political and military leaders to create a separate USAF in September 1947.

In the aftermath of World War II, airmen had to reevaluate the old theories. Would the bombers always get through? The lessons of the war seemed to indicate that the answer to this question was no, not without long-range fighter escorts such as the P-47 and P-51. Airpower leaders also rightly noted that bombing technology and the quantity of bombers had not been sufficient in World War II to allow airpower to be decisive.

Prior to the Korean War, US political isolationists had so curbed military initiatives and weapons development that the United States fought the entire war lacking a true heavy bomber. The B-29 performed well in 1950 before MiG-15 jet aircraft entered the war and shot down too many of the propeller bombers. From 1951 to 1953 they again performed well mostly at night. However, at no time was there sufficient opportunity to exercise new conventional bombing theories that had evolved with the earliest official USAF doctrine in the 1940s and 1950s.

The development of B-36 Peacemaker, B-47 Stratojet, and B-52 intercontinental bombers provided the United States with the capability to deliver a massive nuclear strike against the Soviet Union during the Cold War. Intercontinental ballistic missiles (ICBM) did the same thing; and, more significantly, the strategic bomber force was designed as much to deter war (which it did) as it was to actually deliver a decisive strike. In this regard it succeeded very well.

The lack of a definitive test for the theory that airpower decisively affects the outcome of war continued during the Vietnam or Second Indochina War. Airmen entered the war, in the mid-1960s, without adequate or sufficient tactical fighters or training to fight the "limited" conflict unfolding in the forbid-

B-29 Superfortress

The B-29 bombers (shown during the Korean War) often flew daylight bombing missions.

ding jungles and mountains of Southeast Asia (SEA). Political restrictions on northern targets led to an aerial role reversal—Naval and Air Force tactical fighter and fighter-bomber air assets flew strategic missions during Operation Rolling Thunder, while B-52s reluctantly flew ground-support sorties at 30,000 feet over South Vietnam and later aerial interdiction missions over the Ho Chi Minh Trail. In spite of great courage and sacrifice, these airmen soon discovered that the limits their political leaders placed on them—as well as their own lack of adequate and appropriate weapons and tactics—left them short of their goals once again.

Over the next two decades, airpower technology progressed rapidly; and in early 1991, the Persian Gulf War provided, up until then, the best opportunity to realize the full promise of airpower. With the level of success the air war was having, some

experts asked this question: Why ground operations were not delayed to allow airpower to realize total victory? Even though the dream was not quite realized, this time it was clear that the technical advances of the 1970s and 1980s—as well as the realistic training and increased professionalism and preparation undertaken by the USAF after Vietnam—made the ground combat in the Gulf much less bloody than even Allied leaders hoped it would be. While airpower did not win the war alone, clearly it was, along with President George Bush's creation of the Allied coalition, the decisive factor in the victory.

The events in southeastern Europe in the late 1990s—adjusted and refined by 80 years of history—proved the early theories of airpower pioneers were at least a good starting point. The difficult aerial interdiction campaign NATO forces undertook seemed, as Keegan noted, to alter the realities of military history since most experts believe that such operations work best when coordinated with ground operations. The frustrations of Vietnam would suggest that this is a daunting challenge. Only time will tell how much of these lessons will affect future warfare. Current trends would tend to indicate that the future belongs to aerospace forces.

Airpower Theory and Doctrine in the 1950s

It is important to realize that little had changed in airpower doctrine and theory by the time US airmen and airpower entered the Second Indochina War in 1965—the theories of Douhet and Mitchell were still the basis of Air Force strategy and doctrine. Air Force basic doctrine first officially appeared in 1953; modifications were made to the official manual in 1954, 1955, and 1959. Even though the first manual appeared on the heels of the Korean conflict and there were a growing number of brushfire conflicts unfolding in the developing former colonial nations of Africa, Asia, and Latin America, these basic doctrine manuals essentially ignored any concrete mention of insurgency conflict or the broader concepts of limited war.[10] Instead they focused on the tried and true theories of long-range strategic bombing and fighter escort revised for use against the new strategic enemy—Russian bear. As Dr. Drew contends,

"In each case it was as if the struggles of SEA did not exist and—for the most part—as if the Korean War had not happened. It took till 1955 for the official doctrine to even acknowledge the broader concepts of limited war."[11]

Even at the official levels below AFMAN 1-2, *Air Force Basic Doctrine,* there was a similar lack of attention paid to insurgency or counterinsurgency. Caught up in the Cold War, US airmen were all but totally focused on nuclear strategic conflicts with the Soviet Union and how best to fulfill their role as a component of America's nuclear forces. One notable exception appeared in 1953 in the form of the AFMAN 1-3 doctrine manual. For the first time, an official publication alluded to what it called "special operations." But while it mentioned the 1950s' catchphrase for what would later be called insurgency conflict, it defined special operations as "inserting agents behind enemy lines, supplying partisans, and delivering propaganda." The 1954 revision continued this trend.[12]

In professional airpower theory, the topic of insurgency received some attention in a few major journals but mainly as a peripheral topic. Predictably, much of the writing was by French authors. In late 1952, Gen G. J. M. Chassin, the French air officer commanding Far East, published an important article in the English-language journal *Interavia*. The primary topic dealt with the difficulty of locating guerrilla targets. General Chassin, recalling his own experiences, declared that, "the chief characteristic of the war in Indochina is the invisibility of the enemy." He concluded that "it needs an unusual degree of skill and experience to detect the presence of Vietminh troops in the mountains and forests, where they live under perfect camouflage."[13]

Between 1954 and 1956, the French Supreme Command published a three-volume analysis of their efforts in Indochina. They contained captured Vietminh documents that detailed methods for thwarting superior enemy airpower. In turn, the French authors discussed in some detail "the difficulty of interdicting an enemy who required few supplies and relied on a very primitive and easily repairable logistic transportation system." The work even went so far as to express fundamental doubts as to the efficacy of the basic tenets of US airpower theories based on the Douhetian model. They referred to this

conventional strategic bombing theory as applied to insurgency as "the extremist thesis of Douhetism."[14]

While these insights were available in the late 1950s and early 1960s, US attention to such matters remained secondary. For the most part, the 1950s marked—with some justification—a period of nuclear fascination for the Air Force. In all the years since Douhet, Mitchell, and others first introduced their theories—those who led the Air Force—built airpower weapons and developed theory and doctrine consistently embraced these fundamental concepts as inviolate means of conducting air combat.

As the 1960s dawned and President John F. Kennedy's attention turned first to the Laotian crisis and later to Vietnam, American air leaders had to rethink their role, at least with regard to these new kinds of conflict. Thus, US involvement in the Second Indochina War at least temporarily forced a minor alteration in US airpower theory and doctrine. The nature of that war and its development temporarily altered some of the official basic doctrine manuals and policy papers within the Air Force.

Airpower Enters the Vietnam War

Early in the Cold War, the US Air Force focused on its strategic role of delivering a nuclear strike against the Soviet Union (USSR) and the People's Republic of China (PRC). The Stratofortress was built and deployed for this mission during the 1950s and 1960s—an era of massive retaliation, mutual nuclear force buildups, and US conventional force reductions. However, as former Chief of Staff of the Air Force (CSAF) Ronald R. Fogleman noted, "The harsh realities of Korea and Vietnam showed us the limits of nuclear deterrence and revitalized our interest in, and support for, conventional capabilities."[15]

During the Kennedy years, US military forces became more conventional, since Army and Navy factions in the Joint Chiefs of Staff (JCS) believed that the future would see more limited wars. Thus, budgets of the early 1960s did not provide for a new bomber or even the production of more B-52s. They were supplanted by Minutemen and Polaris missiles, and tactical weapons such as the F-4 Phantom. The XB/YB-70 Valkyrie

supersonic bomber program—a pet project of CSAF Curtis E. LeMay (1961–65)—also ended because it was very expensive, vulnerable, and could not carry such things as the Skybolt air-to-ground missile. Even Sen. W. Stuart Symington (D-Mo.), former secretary of the Air Force (SECAF), disapproved the bomber.

The entire tenor of US defense policy changed from the end of the Eisenhower administration to the beginning of the Kennedy years. This culminated when President Kennedy met with British Prime Minister Harold Macmillan in Nassau on 18–21 December 1962. In what became known as the Nassau communiqué, the two leaders concluded that there was a need to reverse "the atomic 'sword' and conventional 'shield' strategy that had prevailed in Europe. They agreed that 'in addition to having a nuclear shield it is important to have a non-nuclear sword.'"[16]

US defense policy based on massed, manned-bomber retaliation against the Soviet Union, during the Dwight D. Eisenhower years, was replaced by a buildup of conventional weapons and forces to confront brushfire wars in the former colonial and developing nations of the world. With the Cuban missile crisis still fresh in everyone's mind, President Kennedy was determined never again to be left in a situation in which he might have to commit nuclear forces. The thought of having to start a nuclear war about Cuba was indeed sobering; it had almost occurred because the United States had previously placed all its military eggs in the single basket of strategic nuclear response. Kennedy now moved to assure that in the future, the US would be able to use a measured and flexible response to such confrontations.[17]

It was a change that did not please most airpower advocates. General LeMay, the chief of the Strategic Air Command (SAC), openly expressed concerns over dependence on ICBMs at the expense of funding for the B-70 program.[18] John F. Loosbrok, editor of *Air Force/Space Digest*, went so far as to declare that "the doctrine of nuclear deterrence is being replaced by a doctrine of nuclear stalemate. The strategic umbrella, under the shelter of which major Soviet aggression has been deterred or repulsed at many times and in many places

Gen Curtis E. LeMay

General LeMay became chief of staff of the USAF in the early 1960s during America's initial involvement in Southeast Asia.

since the end of World War II, is being replaced by a strategic ceiling—rigid, immovable, and possibly brittle."[19]

In the 1950s, the B-52 had already been developed and deployed to carry out the strategic roles and missions of nuclear deterrence. It was a policy that had begun to change as early as the Defense Reorganization Act of 1958, which declared, "the day of the separate ground, sea, and air warfare was gone forever." In the 1960s USAF policy changed under the able leadership of SECAF Eugene M. Zuckert and eventually led to the creation of a new basic doctrine. Instead of following the pattern in the 1950s habit of changing words and updating catchphrases, the 1964 basic doctrine reflected a new centralized defense structure and a need for flexibility in the Air Force.[20]

America Is Drawn in Deeper

Even as the policy debate continued, the US defense establishment was drawn deeper into the escalating war in SEA.

While the USAF had concentrated on bombers and its strategic mission throughout the late 1950s and wrestled with changes in its roles, missions, and doctrine in the early 1960s, Presidents Eisenhower, Kennedy, and Lyndon Baines Johnson continued the buildup of material support and troop commitments to the US-supported anticommunist regime in South Vietnam headed at first by Ngo Dinh Diem.[21]

On 1 November 1964, Vietcong (VC) forces attacked the Bien Hoa Air Base (AB) just outside Saigon, destroying six B-57s and killing five USAF personnel. President Johnson—outraged—wanted to retaliate. Air Force leaders recommended a massive B-52 raid on the Phuc Yen MiG-capable airfield just outside Hanoi. Johnson decided against the raid because of the upcoming presidential elections, but he asked for a postelection report so he could assess his options.[22]

On 11 November 1964, Assistant Secretary of Defense John T. McNaughton and an advisory team drafted a report titled "Action for South Vietnam," which presented three options. The first option proposed to take reprisal actions to punish the North for its actions in the South. The second option, which the JCS supported, called for "a full-court press" and a series of "systematic attacks on the North—bombing rapidly, widely, and intensely." The third option required a "progressive squeeze and talk" policy that called for covert operations in Laos and bombing North Vietnam (NVN). This option proposed to begin at a low level of intensity in the panhandle area and move up in both latitude and in the level of violence toward more lucrative targets in Hanoi and Haiphong. Johnson favored the third option, since he believed it allowed him to increase pressure until he could reach a negotiated settlement that would leave the pro-US South to build a secure nation. It meant the United States could increase the "quotient of pain" at anytime, posing an implied threat of increased military violence to intimidate Hanoi and the southern antigovernment faction known as the National Liberation Front (NLF) into acting as the United States wished. It also avoided a direct confrontation with the USSR and PRC and provided a sense of consensus within the administration and Congress, which Johnson needed in order to carry out his policies elsewhere.

The third option eventually led to Operation Rolling Thunder, the first US air assault against the North. But President Johnson would not allow B-52s to carry out these strategic raids; instead it was left to tactical aircraft flying from land bases in the South and from US aircraft carriers in the Gulf of Tonkin.[23]

Before he knew it, the president had his hands full with "a pi-- ant little war" in Vietnam, and the United States soon fell into a policy of gradual force buildup and limited use of airpower. It was a plan that ignored the need to stabilize South Vietnam socially, politically, and economically. It was a policy, coupled with the resilience of the enemy that—in retrospect—could not secure South Vietnam or defeat the VC Southern Communist guerrillas or the People's Army of Vietnam (PAVN).

US airpower became a compromise weapon for Johnson. It limited the commitment of ground forces, especially reserves, and caused spectacular numbers and pictures of destruction. It also satisfied "hawks" like Senators Richard B. Russell (D-Ga.) and John Stennis (D-Miss.) while mollifying moderates and defusing liberals. But even airpower had drawbacks; the president rightly feared that air attacks too close to China might cause a repeat of the Korean intervention, which for two years delayed the settlement of that war. Early US air operations were tightly restricted out for fear of war with the PRC or USSR. It was not until the 1970s that President Richard M. Nixon—with friendlier relations with China and the Soviet Union on the horizon—employed B-52s in a more conventional and effective fashion. By then the nature of the war had changed; "Vietnamization" was under way and air power was used to cover a US retreat.

Development of the B-52 Stratofortress

In order to understand the role of B-52s in Indochina and why their initial employment agitated USAF leaders, one must understand the background of the weapon system and know why it was built in the first place. On 28 June 1946, the Air Force designated Boeing's 360,000-pound (lb), six-engine turboprop, straight-wing Model 462 heavy bomber—the XB-52. In October the XB-52's designation was switched to the 230,000

lb, four-engine turboprop Model 464. In 1948 Boeing and USAF engineers agreed to change the design into a sweptwing jet bomber with eight Pratt & Whitney jet engines mounted in four wing pods and a four-unit tandem landing gear.[24]

In March 1949, a board of senior Air Force officers recommended buying the B-52 design. The original contract called for Boeing to build two prototypes—both without expensive tactical equipment—but Boeing and USAF officials later agreed to install tactical equipment on the second bomber, redesignating it as the YB-52 prototype. Contrary to normal procedures, it flew on 15 April 1952—before its XB cousin—when test pilot A. M. "Tex" Johnston flew it for two hours and 31 minutes from Renton Field, Seattle, Washington, to Larson Air Force Base (AFB), Washington. By October it "had flown 50 hours at speeds up to Mach 0.84 without full power at altitudes above 50,000 feet." The USAF accepted the YB-52 on 31 March 1953 but left it with Boeing for further testing. It made 345 flights covering a total of 738 hours.[25]

The XB-52 flew for the first time on 15 October 1952 and was accepted in 1953 for the Air Force's Phase II flight test program. The biggest change in the B-52A production models was the expansion of the nose section, which provided side-by-side pilot seating to replace the original tandem seating arrangement. The B-52As flew for the first time on 5 August 1954. Originally, the Air Force agreed to buy 13, but only three were accepted while the other 10 were completed as B models.[26]

To counter new Soviet intercontinental jet bombers in 1955, Boeing opened a second assembly line in Wichita, Kansas, to increase B-52 production by 35 percent.[27] Fifty B-52Bs became the first BUFFs deployed to active duty units of SAC. On 29 June 1955, B-52B serial number 52-8711 arrived at Castle AFB, California, and was assigned to the 93d Heavy Bomb Wing (BW). The wing became fully operational on 26 June 1957.[28]

Boeing built 35 B-52C and 100 B-52E models, but it was 30 of the original 89 F models—with their J57-43 engines—that were the first B-52s deployed to SEA in March 1965. These were the last B-52s built in Seattle. Wichita built the last two models, assembling 193 Gs and 102 Hs between 1958 and

1962. The G models entered service in SEA during the Linebacker II campaign of 18–29 December 1972. They, along with the B-52Ds, became the weapon of choice during these raids. Of the 15 B-52s lost to northern air defenses during Linebacker II, seven were G models. Overall, Boeing built 744 B-52s. Vastly upgraded versions of the later models still remain the backbone of America's manned bomber force. Their ability to deliver air launch cruise missiles has made them a particularly effective strategic air asset in the late 1990s. The B-52s are also the longest serving bomber in US history.[29]

Arguably, the most significant B-52s in Vietnam were the D models. The Seattle plant built 101 Ds and the Wichita plant 69, the first flying on 4 June 1956. With US involvement in Vietnam growing by 1965, USAF officials initiated the $16-million "Hi-Density" or "Big Belly" modification program, which reconfigured Ds and provided the United States with the first bomber able to carry out massive strategic missions over the North, even though this would not occur for nearly seven years.

B-52D and B-52G

The B-52D is prepared for launch as a B-52G (background) lands during the 11 days (18–29 December 1972) of Operation Linebacker II.

It also afforded the United States with an aircraft capable of successfully carrying out the tactical mission to which B-52s would originally be assigned—Arc Light.[30]

Insurgency War and Doctrine in the Early 1960s

As the 1960s dawned, the B-52s were the backbone of America's Cold War strategic strike force and a key component in the nuclear triad. They were weapons that the USAF could not possibly envision using in any other role, especially not in a guerrilla conflict in SEA. Even so—as noted earlier—during the early 1960s, conventional wars and tactical weapons development received more emphasis. Kennedy paid increasing attention internationally to brushfire wars in Asia and Africa.

Within the inner circles of the Air Force—especially within the newly created Aerospace Doctrine Division of the Office of Deputy Chief of Staff for Plans and Programs—key leaders believed that a new, more clearly stated, basic doctrine was needed, as well as long-range planning. Instead of cosmetic changes in doctrine which had been the norm in the 1950s, many, like Maj Gen Dale O. Smith and Brig Gen Jerry D. Page, who headed doctrinal work in the Air Force, wanted substance and eternal vision incorporated into Air Force doctrine.[31] While this did not mean that insurgency issues would suddenly become a major focus, it indicated a growing need among airmen to define clearly their ever-evolving job. With the war in Vietnam growing this meant that such considerations had to include defining airpower's role, since the Air Force—albeit reluctantly—would soon be involved in that war.

Changes in basic thinking came slowly in the early 1960s, but they came. It was a shift that did not specifically address airpower's role in limited brushfire wars, and it forced airpower leaders to reexamine and redefine their long-held beliefs and theories. In 1962, General LeMay wrote an article titled "Air Power in Guerrilla Warfare," which recognized the need for airmen to examine low-intensity conflict. Still, this same study concluded that "general war poses the primary military threat to the security of the Free World, and it is under the umbrella of strategic superiority that the United States has freedom of maneuver in the lesser forms of conflict."[32]

The interest in insurgency warfare among airmen grew hereafter. In September 1962 the newly created Special Air Warfare Center held a symposium on limited war as part of the Air Force Association (AFA) national convention. Within two years, the interest generated by this meeting and the growing role of the United States in Vietnam culminated in the publication of a new Air Force basic doctrine manual in August 1964. Within the manual, one brief chapter correctly described both insurgency and the goals of counterinsurgency. It delineated airpower's role in both combat and noncombat missions and discussed the "difficulties in interdicting guerrilla lines of supply."[33] The latter concern would need to be addressed again during Commando Hunt operations (1968–72). Ironically, Commando Hunt would prove the efficacy of this part of the new basic doctrine manual. It also proved the relative merits and shortcomings of B-52s in attempting long-range interdiction missions over enemy-held territory, especially flying over imposing mountains and dense jungle terrain.

But while the new basic doctrine manual of August 1964 included a discussion of insurgency and counterinsurgency, like LeMay's earlier article, its doctrinal emphasis remained—as Dr. Drew says, "where it had been since the advent of nuclear weapons and the creation of the independent Air Force"—on the strategic mission.[34] The main reason for the new basic doctrine manual in 1964 was not because of insurgency but the change in foreign policy and the advances in military technology. In 1963 LeMay had directed Gen Bernard A. Schriever, commander of Air Force Systems Command to make "a comprehensive study and analysis of the Air Force structure projected into the 1965–1975 time period."[35] As Dr. Robert Frank Futrell contends in his monumental work on Air Force theory and doctrine, both Zuckert and LeMay recognized that the Air Force needed to "take stock of its capabilities and to look to its future potential."[36] To Zuckert the past had to be altered. The Kennedy administration's policies were different, and the Air Force should adapt to them. He clearly believed that "Air Force doctrine should be designed to support national policy and strategy, which was a somewhat different concept from a pure aerospace power doctrine based on the

absolute capabilities and limitations of aerospace forces in peace and war."[37]

The result of Zuckert's lobbying was the formulation of the previously mentioned new basic doctrine manual on 14 August 1964—titled *United States Air Force Basic Doctrine*—designed to break with the past doctrines in substance and form. The basic doctrine manual was no longer designated 1-2, but 1-1. It moved USAF doctrine away from deterrence alone, assuming that nuclear war was less likely in the 1960s than it had been in the 1950s. As Futrell puts it, AFMAN 1-1 "adapted its doctrine to the concept of national security that had emerged from the new strategic situation in which thermonuclear weapons and an assured delivery capability in the hands of potential enemies had altered the use of total military power."[38] Perhaps equally important was the addition of the concept of flexibility of airpower in response and capabilities. This also led to the inclusion of a brief but important section on insurgency; but it did not mean that the basic theory of airpower, born at the beginning of the century, had changed—only that other aspects were being considered for the time being. The vast majority of airmen still believed in the employment of B-52s in their strategic role, the basic role of the Air Force.[39]

Arc Light (B-52 Raids, 1965–68)

General LeMay's article and the 1964 AFMAN 1-1 notwithstanding, when the first B-52Fs arrived in Vietnam, much to the consternation of Air Force leaders, the flagship of the strategic air fleet was to be employed in a role contrary to their traditional concepts of strategic projection—namely Arc Light. Even though B-52s were and are strategic bombers, Arc Light was not primarily a strategic air campaign. They were ground support missions flown at high altitudes over South Vietnam, Cambodia, and Laos in support of Allied ground forces or missions to interdict northern infiltration of troops or supplies. Arc Light raids were B-52 operations flown out of Guam and Thailand (and some from Kadena AB in Okinawa, Japan) from 18 June 1965 to 15 August 1973. Through 1968, most Arc Light sorties were flown below the 17th parallel, with only 141

missions flown in NVN, most near the demilitarized zone (DMZ) below the 20th parallel. It was not until the Linebacker operations of 1972—especially the December bombings—which the big bombers performed as strategic assets.[40]

The first 30 B-52Fs arrived in Guam in February 1965. In March as US Marines landed near Da Nang, the JCS proposed melding B-52s into the new Operation Rolling Thunder campaign. The State Department opposed this proposal, believing it would send dangerous signals of escalation to the PRC and USSR. Many planners realized that B-52s—with only 1965 technology—would have difficulty flying missions in Vietnam, since the terrain provided few offset aiming points or specific ground references to assure accurate bombing. US officials also feared that the loss of even one B-52 to enemy fire would be a major blow to America's world image and to South Vietnamese morale.[41]

Air Force leadership was displeased that the BUFFs—centerpiece of the US nuclear bomber force—were in SEA at all. Officials at SAC worried that if too many B-52s went to Asia, they might not have enough to fulfill their role as part of the US nuclear force.[42] In early 1964, the JCS had amended the Joint Strategic Capability Plan to require that 30 B-52s be available for worldwide contingencies. During meetings with JCS leaders in Honolulu, Hawaii, in April, Gen William C. Westmoreland, commander, Military Assistance Command, Vietnam (MACV) implored the JCS to allow him to use B-52s against VC base camps. He argued that B-52s were better suited for this job than fighters and fighter-bombers, because they could efficiently deliver a wide, even pattern over a large area.[43]

In 1965 "the concept of operational bombing procedures for large scale non-nuclear strikes was inconsistent with existing SAC materiel concepts," since B-52 crew training and doctrine were designed for strategic nuclear conflict. Luckily, "the basic Arc Light task of area bombing . . . required only a narrow spectrum of the available conventional weapons inventory," which included M-117 750 lb bombs, MK-82 500 lb, BLU-3B and BLU-26B antipersonnel bomblets, and AN-M65A1 general purpose and AN-M59A1 semiarmor-piercing 1,000 lb bombs. At first the standard Arc Light load for B-52s based on Guam

was 42 M117s loaded internally and 24 MK82s loaded externally. B-52s in Thailand carried 84 MK82s internally and 24 M117s externally. During the first three years of Arc Light, high explosive bombs accounted for 97.2 percent of the total bomb loads.[44]

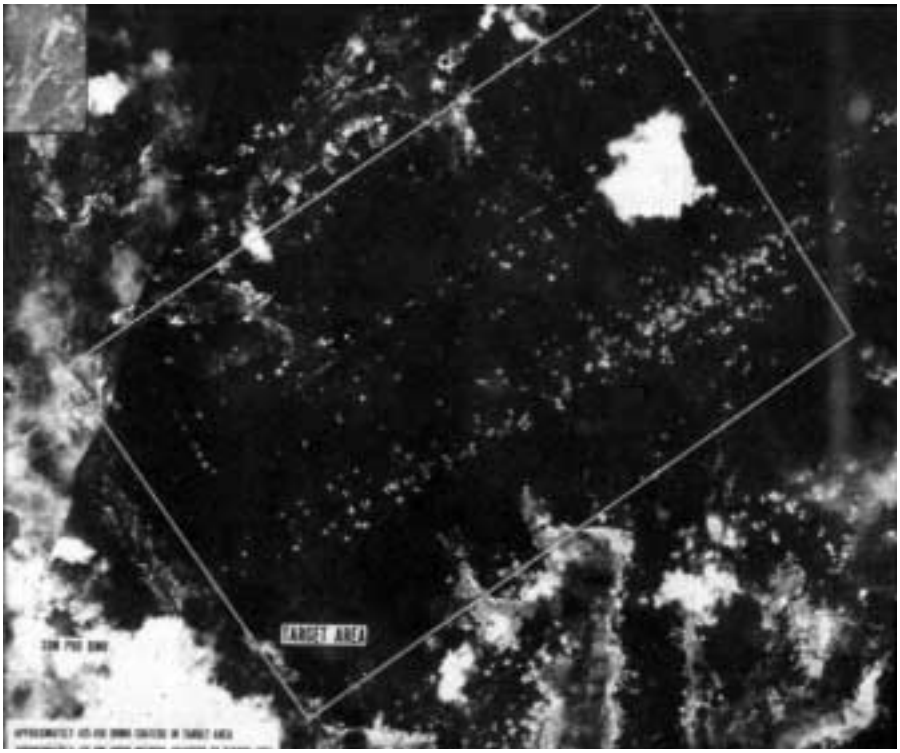
In May the JCS approved Westmoreland's formal request. Plans now began for conventional B-52 raids over South Vietnam. However, as noted above, pilots were accustomed to using radar to locate ground targets; and in 1965 Vietnam, radar data was scarce, besides they had little experience flying over dense, three-canopy jungle. Air Force officials temporarily solved this ground-reference problem with homing and targeting beacons that they seeded in the target areas. Planners decided that once radar files had been built up sufficiently, they would go back to radar synchronous bombing.[45]

On 15 June, VC forces were discovered near Ben Cat at a regional headquarters 10 miles north of Saigon, and a raid was scheduled for 18 June. Johnson, fearing negative world reaction from the use of the B-52s, demanded assurance that no civilian areas would be hit during the raid. Ambassador Maxwell Taylor instructed Brig Gen George Simler, chief of Operations, 2d Air Division (AD), to accompany the mission in a C-123 Provider to guarantee tight command and control so no bombs would accidentally fall on nearby villages.[46]

Plans called for 30 B-52Fs of the 7th BW and 320th BW to launch from Guam at 0100 hours, rendezvous for aerial refueling over Luzon, Philippines, and meet over the target at 0730 hours. There were 10 three-aircraft cells; 24 planes carried fifty one 750 lb bombs, while six carried 1,000 armor-piercing bombs. Things began as planned, but tailwinds from a typhoon in the eastern Pacific pushed the bombers ahead of schedule. When the first cell banked 360 degrees to slow for the arrival of the refuellers, they ran into the path of the second cell in the dark skies over the South China Sea. Two planes collided and crashed into the sea. Eight crew members perished, while the four survivors and one body were recovered. Only 27 of the bombers refueled. The 28th bomber, with a broken hydraulic pump and radar, landed in Okinawa. The remaining bombers crossed the Vietnamese coast at 0630

hours and dropped their first bombs 15 minutes later from about 20,000 feet. Guiding off a beacon placed in the area the night before, they bombed a one-by-two-mile target box with 1,300 bombs. Half the bombs hit inside the box. They then flew south to avoid the Cambodian border, and near Saigon they turned east toward Guam. One bomber was forced to land at Clark AB (formerly AFB), Philippines, because of electrical problems. The last bomber landed exactly 13 hours after the first one had departed.[47]

Shortly after the raid, three US-led 36-man Army of the Republic of Vietnam (ARVN) reconnaissance teams inspected the area and found no enemy bodies and little damage to the camp area. Later, MACV discovered that the VC had fled on a tip from a spy in the local ARVN unit. The raid made news headlines



Arc Light Target Box after a Raid

across the world, some terming it a “fiasco,” others comparing it to “using a sledgehammer to kill gnats” or using a “sledgehammer to kill fleas.”[48]

While the results were less than spectacular, Westmoreland told the media he now had the perfect weapon to attack a “dug-in enemy target, saturate large areas, surprise the enemy, reduce his safe havens, and encourage the timid South Vietnamese soldiers to venture into Vietcong base areas.” The Air Staff was not pleased. One USAF report responded, “Of course, this would have to be balanced against the problem of fixing VC targets with enough accuracy to allow attacks on small target areas. Also, the longer reaction time of Arc Light forces does not allow for a response against transient VC targets.”[49]

Despite these concerns, plans went forward for more Arc Light raids. B-52s flew five missions in July and 10 in August. On 2 August 1965 they returned to the use of radar synchronous bombing. By mid-August, the 30 bomber flights were replaced by fewer planes flying more missions. Raids no longer had to be preapproved; instead, five “free bomb zones” were created and target folders made up for short-notice missions. Two zones were located just north of Saigon, two were at the southern tip of South Vietnam, and the last was southeast of Da Nang near a suspected VC regimental headquarters. In addition, the JCS assumed final target approval for Arc Light; Westmoreland became involved only when US troops were in the target area to avoid alerting enemy agents again. The smaller-formation raids began 26 August; and by October, as few as five planes flew in formations that allowed the 30 B-52Fs to carry out multiple missions.[50]

On 14 November, 1st Cavalry Division units—after repelling an attack against the Plei Me Special Forces camp in the Central Highlands and mopping up near Pleiku—uncovered a secret North Vietnamese Army (NVA) base defended by two regiments in the Ia Drang Valley near the Cambodian border. The allied ground forces called in air strikes, and 18 B-52s hit the area on the 16th dropping 344 tons of bombs. By the end of the month, they had flown 96 sorties and dropped 1,795 tons of bombs.[51]

Modifying the B-52 Fleet

These early raids demonstrated to USAF officials that the B-52s needed to carry more bombs. As early as summer 1965, the USAF approved Engineering Change Proposal 1224-7 "Hi-Density Bombing System" to modify 82 B-52Ds to carry 84 rather than 27 500 lb bombs or 42 instead of 27 750 lb bombs internally. Including bombs fixed to the wings of the bombers, this increased the B-52's total maximum bomb load from 38,000 to 60,000 lbs. In February 1966, approval was granted to modify the remainder of the 155-bomber fleet. The first D model began modification on 16 December 1965; and the entire 155-bomber force was completed by 8 September 1967. B-52Ds from the 28th BW and 484th BW deployed to Andersen AFB, Guam, in April 1966, gradually replacing F models in combat. In March 1967, Ds also began operating out of U Tapao Royal Thai AB (RTAB), Thailand. The new bombers were completely deployed by early 1968. Of these 155, 22 were lost in Vietnam.[52]

The USAF selected the Ds for modification for several important reasons. There were only 82 Fs, and they were running out of flying time. The Fs had no reserve capability and could barely fly the ever-increasing monthly sortie requirements of

B-52Ds at U Tapao Royal Thai Air Base, Thailand

1965–66. Even though the Ds were older, they were being upgraded in other basic areas that increased their life expectancy by 2,000 hours—double that of the Fs. The G and H models were held back for their "more significant [single integrated operations plan] SIOP role"—delivering a strategic nuclear payload. The Ds were also refitted with all-weather capability; a major problem facing all US aircraft in 1965 and 1966. As one RAND Corporation report noted in 1966, "The Air Force has no (conventional weapon) capability for all-weather bombing in SEA."[53]

As noted, the 28th BW and 484th BW deployed the first B-52D Big Bellies to Guam in April 1966, but when they arrived they discovered a lack of standard ordnance. Specifically, there were no MK-82 bombs left on Guam. Until the bombs were shipped from Ellsworth AFB, South Dakota, the first Big Belly missions flew with 24 M-65 1,000 lb bombs internally and 24 M-117 750 lb bombs externally. The B-52s were not the only ones to suffer shortages. Naturally, in 1966–68, as the sortie rate for the BUFFs rose from 100 to 1,600 per month, so did the expenditure of bombs. Soon, this impacted Rolling Thunder as well. Some USAF officers even privately suggested that Army leadership in Vietnam was undertaking the Arc Light raids just to steal attention from what USAF leaders perceived to be the more important air campaign over NVN.[54]

Arc Light Expands and Airpower Controversies Grow

By spring 1966 President Johnson had become less concerned with the negative impact of the B-52s on public opinion, believing they were effectively curtailing enemy infiltration and hurting enemy morale in South Vietnam. Adm U. S. G. Sharp—commander in chief, Pacific Command (CINCPAC)—was given approval for target designation. Instead of facilitating use of the powerful B-52 weapon, the new policy only compounded tensions between airmen and their Army and Navy counterparts. Airmen had been upset that Army ground commanders were ordering the greatest strategic bomber ever built into a ground support role, but now to have a naval officer pick targets was simply unbearable. Target restrictions and lack of target flexibility was nothing new for airmen; to

them it had always been an annoying feature of Rolling Thunder. In the case of Rolling Thunder, the restrictions and target approvals came directly from the White House, thus reducing target value and increasing response time.

While General Westmoreland was pleased with the new Arc Light policies, Westmoreland's direct control over these strategic air assets caused Gen William W. "Spike" Momyer, Seventh Air Force commander, to worry openly that the entire process not only violated the basic concept of a separate strategic and tactical air force run by airmen trained in such combat but that "Westmoreland's employment of the B-52s as long range artillery to suppress 'what may or may not be suspected concentrations or supply areas' was questionable and relatively ineffective."[55]

Momyer wanted to use the B-52s against specific targets, reserving just two squadrons to fly approximately 150 sorties each month, while using tactical aircraft to strike enemy concentrations. This disagreement came about partly because no one had any hard evidence regarding how effective US air forces were; since there were no "quantifiable assessments, each general adopted a position that fit his preconception of the role of airpower."[56]

Normal Air Force intelligence and data collection were all but completely absent during the Vietnam War. In previous wars the Air Force had kept a data catalogue for airmen to use in planning operations. They did not do so in SEA until 1968 during the Tet Offensive and siege at Khe Sanh. Their lack of ability to select ground targets or use their assets in close air support (CAS) roles also meant that it was all but impossible to commit reconnaissance assets to establish the effectiveness of Arc Light or any other raids in Vietnam. Perhaps World War II hero Lt Gen Elwood R. Quesada—USAF, retired—put it best after returning from a special fact-finding tour of Vietnam in early 1966.[57] In his evaluation of the use of airpower (especially B-52s) in Vietnam he declared, "Our effort in Vietnam . . . to me as far as air power was concerned was a little bit of what I used to refer to as operational masturbation. I have always felt that the B-52s were to a large extent bombing forests . . . It was just clear to me that tactical airpower as being exercised in that theater was the product of the Army and Army thinking."[58]

There can be little doubt that Vietnam was a show produced and directed by Army leaders. The direction of the Kennedy and Johnson defense policy, as we have seen, moved away from strategic policies and nuclear bombers toward weapons and policies (mostly ground) designed to meet guerrilla wars. In the early 1960s, the buildup of Army aviation mirrored this new direction. Eventually, helicopter gunships and transports, as well as a myriad of observation aircraft, fit nicely into the JCS Publication 2, *Unified Action Armed Forces*. To the Air Force, this new direction was not only a violation of assigned roles and missions but also an expensive duplication of Air Force assets and capabilities. Perhaps worst of all was the fact that Air Force Regulation 1-1, *Aerospace Doctrine: Responsibilities for Doctrine Development,* also charged Tactical Air Command (TAC) to "work in coordination with the Army Combat Developments Command to develop mutually agreeable joint doctrinal manuals for submission to the Joint Chiefs of Staff."[59]

One of the main reasons B-52s had to do the job normally reserved for tactical air assets was that most tactical assets were being used in Operation Rolling Thunder. Another reason was the lack of fighters of the kind needed (ones that flew lower and slower) to carry out CAS or other important tactical roles, especially in the South. Tactical weapons development and fighter pilot training had reduced the US fighter advantage in all areas, especially air-to-air combat. As Dr. Futrell laments, "It was tragic irony that the air war in SEA would necessitate an agonizing relearning process and a hurried adaptation of weapon systems back into an arena thought to have been eliminated [conventional tactical fighter operations]."[60]

The numbers show just how far the US fell between Korea and Vietnam. During World War II, the best figures available indicate that in Europe 7,422 enemy fighters were shot down while the US lost 1,691, a ratio of 4.4:1. In Korea, the numbers were 874 to 122, or a ratio of 7.2:1. In Vietnam, the North lost 195 fighters—139 to Air Force fighters and 56 to Navy fighters—while the US lost 61 Air Force fighters and 16 Navy fighters, totaling 77. The ratio was 2.53:1. The numbers changed once better aircraft, antiradar jammers, and targeting

systems like Teaball were employed. After 1972, the ratio reached 5:1, with better training also making a big difference.[61]

It is also worth reiterating that many experts, especially airmen, believed that Vietnam was a ground war run by ground commanders, which excluded considerations from any other service. To many airmen like Momyer, not only was Westmoreland's focus totally on the ground war but also the fact that Army forces had become too dependent on air cover. Maj Gen Theodore R. Milton went so far as to declare that "the Army became over-dependent on air support, and air support of a kind highly vulnerable against a modern force."[62] For these reasons, the B-52 became the weapon of last resort for Arc Light.

Even so, the B-52s should have been placed directly under Momyer's command; he was in the best position to decide which targets were most valuable and how best to use all air resources. In the end, the JCS concocted a compromise by which Momyer became Westmoreland's MACV deputy for air. Under the new plan, operational control was given to Momyer, and most Air Force officers—especially intelligence personnel—were moved from MACV to Momyer's staff. Much remained the same, since Westmoreland still picked the targets, and, as Momyer declared, "as long as Westmoreland picked the targets the aircraft would continue to be used for close air support rather than for interdiction."[63]

Throughout the years of Rolling Thunder (1965–68), controversy swirled over actual control of air assets. As noted, Momyer had long wanted a single manager for all tactical combat aviation—preferably an airman. But control of air assets remained a chaotic malaise of interservice rivalry, especially in South Vietnam. Finally, on 18 January 1968, General Westmoreland proposed placing all tactical and CAS assets under a single manager—the MACV deputy for air. When he revealed his plan to Maj Gen Norman J. Anderson, commander of the 1st Marine Air Wing, and III Marine Amphibious Force commander, Lt Gen Robert E. Cushman Jr., they balked. As Westmoreland recalled, "Anderson became rather 'emotional,' declaring that the Marine Air Wing belonged to the Marines and no one else."[64]

The disagreement went all the way to Washington, where Gen Leonard Chapman Jr., Marine commandant, supported his subordinates so vehemently that the overall area commander—Admiral Sharp—decided to have Westmoreland temporarily withdraw the proposal. However, the Tet Offensive soon made Westmoreland's reorganization plan a requirement; and as a result, on 8 March Momyer was given mission direction, and the USAF was given overall command. It was a policy continued under Gen Creighton Abrams from 1968 to 1972; and as Momyer remarked years later, it was a policy that "should have been done long before." In many ways the turning point of the siege at Khe Sanh was the flexible air response under a single manager, which began in March. Momyer believed that it was.[65]

Arc Light Operations Continue

From the beginning of Arc Light in 1965 and throughout the remainder of US involvement in Vietnam, American leadership employed the B-52s in a number of ways. Primary among these was aerial interdiction, especially of the Ho Chi Minh Trail. It later became a key weapon during the Commando Hunt operations of 1968–72.

One of the first interdiction missions came during 12–26 April 1966 when B-52s bombed NVA infiltration routes through the Mu Gia pass between NVN and Laos. Among the targets were trucks, road work crews, and air defense sites. Westmoreland continued to rave over the results, declaring at one point that "we know, from talking to many prisoners and defectors, that the enemy troops fear B-52s." The annual report by Headquarters Military Region (MR) VII—captured during Operation Silver City II, by the 173d Airborne Battalion on 14 March 1966—seemed to confirm the general's argument that "there was some evidence of reluctance [by enemy forces] of performing missions for fear of B-52 aircraft."[66]

While there can be little doubt that B-52 raids struck terror into the VC and NVA, one must question the effectiveness of these strikes. After two weeks of attacks along the Mu Gia pass, MACV requested that CINCPAC allow the strikes to continue because the traffic flow had returned to prestrike levels.

CINCPAC replied that while interdiction operations were important, he could "not allow additional B-52 strikes because of the increased danger from SA-2 missiles: 'Past Arc Light strikes have closed Mu Gia for relatively short periods of time. Results of future strikes probably would not improve this situation significantly. As circumstances stand now, further strikes do not appear justified unless the results can be offset by reducing the threat anticipated.'"[67] The reply not only demonstrated the potential futility of the entire interdiction effort but also demonstrated CINCPAC's justifiable concerns over Soviet surface-to-air-missiles (SAM), which had been placed along the Ho Chi Minh Trail.

In 1966, B-52s dropped an average of 8,000 bombs per month and flew a total of 5,000 bombing sorties. By contrast, US tactical aircraft flew 355,000 sorties and 74,000 fixed-wing missions. In March the JCS had approved Westmoreland's request to set the monthly B-52 sortie rate at 450, which he then raised to 800 in June 1966. The previously mentioned bomb shortage kept this number to 450 until August, while the actual sorties did not reach 800 until March 1967. By late 1967, Arc Light had already cost $780 million.[68]

On 1 July 1966, the first Arc Light quick-run operations began when six B-52s of the 4252d Strategic Wing, Guam, and six KC-135s, Kadena AB initiated a modified alert system, which reduced response time to nine hours from notification to time over target. It allowed field commanders to concentrate bombing with the support of the Combat Skyspot rapid-response targeting system, a ground-directed-bombing system in South Vietnam employing SAC mobile ground radar units. It increased MACV targeting latitude, and the selection of targets no longer depended on a nearby prominent geographical feature. B-52s could be guided to targets as long as they were within range of a Skyspot radar point. One report noted, "Accuracy soon surpassed that of any previously used radar synchronous bombing."[69] While perhaps an exaggeration, clearly Skyspot upgraded bombing accuracy, especially regarding target location.

As the sortie rates rose to 1,800 in March 1968, the turnover of trained pilots and crews soon caused a problem—the quantity of rated personnel was insufficient to fulfill SAC's dual mission

role during the first three years of Arc Light. Pending separations, valid deferments, medical deferments, and so forth kept the number of qualified crews low, and since the skills necessary to fly nuclear and conventional bombers were different, training had to be altered in many cases to meet new requirements.[70]

As early as 3 January 1967, overall Air Force pilot shortages required officials to recall 2,300 older pilots while instituting a new shorter and more intense training program to train 3,247 new pilots per year. Continental US operations required fewer personnel to do similar jobs in SEA; thus the SAC units in theater drew on crews from all over SEA hampering other operations, such as Rolling Thunder. In one effort to solve this problem, SAC officials began assigning hundreds of personnel to 179-day temporary duty assignments. The shortages continued while the divorce rate skyrocketed. In spite of every effort to remedy these problems, pilot and ground crew shortages remained a problem throughout the war.[71]

By mid-1967, B-52s began Arc Light operations from U Tapao RTAB, which meant they could fly two- to five-hour nonrefueled missions instead of the 12- to 15-hour missions from Guam, which included dangerous refueling rendezvous over the Pacific. On 13 September 1967, the final modified B-52D arrived in Guam; and even though crew training delayed the full use of these new large-capacity BUFFs, by the end of the year they were doubling the Arc Light bomb delivery rate. In late 1967, B-52 units in SEA were augmented by elements of the 306th, 91st, 22d, 454th, 461st, and 99th BWs, allowing an increase in the number of Arc Light raids. B-52s flew nearly 9,700 bombing sorties in 1967, twice the number flown in 1966. On 6 May 1967, B-52s flew their 10,000th sortie having dropped 190,000 tons of bombs.[72]

By 1967 Arc Light was a growing enterprise. From 22 February to 14 May 1967—during Operation Junction City—B-52s flew 126 sorties and dropped 4,723 tons of bombs; of the 2,700 enemy troops killed during the operation, 75 percent died under the rain of B-52 bombs, including Gen Nguyen Chi Thanh, commanding general, Central Office for South Vietnam.[73]

Between 11 September and 31 October 1967, B-52s supported Marine units defending Con Thien and Gio Linh just

south of the DMZ. Fearing that enemy attacks were the prelude to a major offensive, allied forces countered these attacks with Operation Neutralize. B-52s flew 910 sorties during round-the-clock operations against enemy gun positions six miles north of Con Thien. In total, 3,000 enemy troops were killed.

In late 1967, B-52s flew 228 sorties against 32 targets during an engagement between the US 4th Infantry Division and the NVA 1st Division near the Special Forces camp at Dak To. The BUFFs also flew 36 more sorties in late November in support of US and ARVN forces fighting VC main force units near Loc Ninh. They made their deepest penetration into NVN up to that point when they attacked storage areas and truck traffic 102 miles northwest of Con Thien.[74]

In September 1967, Secretary of Defense (SECDEF) Robert S. McNamara requested a report on the air war from the Institute for Defense Analyses' Jason Division, an ad hoc group of 87 high-level scholars and scientists. Based on Central Intelligence Agency (CIA) data, their December 1967 report declared, "the Jasons categorically reject bombing as an effective tool." Rather than having been degraded, they determined that enemy transportation "actually had been improved because of added redundancy. Where one road had existed previously, several had been built." Citing this evidence, they judged, "we are unable to devise a bombing campaign in the North to reduce the flow of infiltrating personnel into [South Vietnam] SVN."[75]

In spite of this compelling report, the JCS tenaciously clung to their belief in the effectiveness of the bombing and made 10 new recommendations they believed would make the air war more effective. A few of these recommendations were removal of all restrictions on military targets, the ability to mine all ports, and the wider use of the B-52s throughout the theater. Johnson wrestled with both opinions. In spite of domestic and foreign political and economic pressure to end the costly war, he was still determined to see the war to a successful conclusion. He desperately wanted a conventional strategy to defeat the enemy; but every time the JCS demanded more freedom to bomb enemy sanctuaries, Johnson wondered if their next request would be to "bomb targets in China." In a moment of

utter frustration, he lashed out at several officers, "bomb, bomb, bomb, that's all you know."[76]

One of the most significant B-52 operations occurred during the NVA's siege of the Marine base at Khe Sanh, which began in late January 1968. During Operation Niagara (14 January–31 March 1968), B-52s flew 2,707 sorties dropping 75,631 tons of bombs—using a scheduling technique known as Bugle Note—in which ground radar and ground crews kept aloft an unbroken stream of three to six aircraft which struck enemy targets every three hours. The B-52 three-aircraft cells arrived over a predesignated interception point, where they were picked up by Skyspot ground radar and directed to a series of specific targets. This way, targets could be changed up to two hours prior to target time. These tactics also meant that the BUFFs could virtually bomb the enemy around the clock.[77]

At first, the targets were staging areas, storage sites, and artillery positions 3,300 yards outside the Marines' outer perimeter. Later, US reconnaissance units discovered an enemy bunker complex inside the buffer zone. Beginning on 26 February, B-52s and other aircraft began strikes within one-sixth mile of US lines. The BUFFs proved their accuracy. During the 589 close-in sorties, there was no US damage.[78]

Johnson referred to the Khe Sanh air campaign as "the most overwhelming, intelligent, and effective use of airpower in the history of warfare." Westmoreland added, "The thing that broke their back basically was the fire of the B-52s." A captured NVA officer estimated that 75 percent of his 1,800-man regiment had been killed by a single Arc Light strike.[79]

In April, B-52s flew in support of Operation Pegasus, the 1st Cavalry Division's (Mobile) spearhead to break through enemy positions on Route 9 and end the siege at Khe Sanh. Later in the same month, they supported Operation Delaware, a sweep of enemy positions near the Laotian border in the A Shau Valley west of Da Nang. The B-52s flew 726 sorties and hit 123 targets. Between 19 April and 24 June 1968, B-52s supported Operation Turnpike, an effort to impede "the infiltration of the unprecedented volume of men and material flowing into South Vietnam" after the cessation of the Tet and Khe Sanh bombing raids. The targets were truck parks, storage areas, and troop

concentrations along the Laotian border. B-52s cut main artery roads in order to force traffic backups. Other B-52s then bombed the congested areas.[80]

The pace of the air war changed in 1968 when Johnson halted US bombing of North Vietnam in an attempt to start serious peace negotiations. Even so, B-52 raids continued. Not only did regular Arc Light raids continue until 1973 but President Nixon would also later sanction secret Menu operations in Cambodia during 1969 and 1970, as well as six of the seven Commando Hunt Laotian interdiction operations that lasted from late 1968 to early 1972. For B-52s the coup de grâce would come during the Linebacker I and II strategic missions in 1972.

Air Force Theory and Doctrine in the 1960s

As air operations in SEA grew, established theory and doctrine had to wrestle with the realities of this kind of conflict. In the early 1960s, some USAF Academy and Air University (AU) papers and professional articles from the *Air University Review* examined the role of airpower in insurgency and guerrilla war. Most agreed with one 1962 Air Command and Staff College paper, "Air Power in the Fight against Guerrillas," which declared that anyone who believed that conventional airpower was limited had "overlooked the inherent flexibility of the air vehicle. There is no such thing as limitations or impossible conditions, only incorrect tactics or poor employment."[81] While such a statement seems clear, the paper still does not fully elaborate on how airpower, particularly B-52s, should be applied. None of the other papers or articles from that era explained how airpower should be used in SEA, and none of the articles paid more than passing attention to the issues of nonconventional applications of airpower.[82]

During the late 1960s, only one significant study—"Counterinsurgency from 30,000 Feet"—appeared that examined the effects of B-52 antiguerrilla ground support operations on USAF doctrine. The study is an operational look at the subject in which Robert Kipp, a civilian historian with SAC, touted the effectiveness of the B-52 bomber in countering guerrilla forces. Unfortunately, the article was not an in-depth effort designed to

define any new airpower theory, clearly expound insurgency or limited war, or explain airpower's role in such conflicts.[83]

Official doctrine experienced a dramatic change with the publication in March 1967 of AFMAN 2-5, *Tactical Air Operations Special Air Warfare*. It was exclusively devoted to special air warfare; and it provided airmen with the first detailed and thoughtful analysis of special air warfare, defining it as the efforts to "strengthen or create resistance to enemy authority among the people within enemy territory." The manual's authors determined "that military and non-military counterinsurgency actions must be totally intertwined and mutually supporting." They also called for the creation of "country teams," which were to include diplomats, civilian aid personnel, information agents, military assistance advisors, and unified military command and military component command personnel. Such teams, they argued, should be used to establish and direct a unified strategy.[84]

The manual also declared that the military component of strategy must be able to adjust to each phase of the insurgency conflict and that, within these phases, special air warfare endeavors should range from nation building to open combat. The manual emphasized that during combat it was very difficult to obtain totally accurate target identification. Such identification was very important, since "military actions by friendly units which kill or injure innocent civilians can lose the loyalty of an otherwise friendly village." A clear understanding of insurgency theory led the authors to realize "the fact that both sides in an insurgency have the same 'center of gravity' [the people] and the objective of both sides is to capture the support of the population."[85]

This was no idle assertion. Throughout the Vietnam War one of the allies most difficult jobs was winning the hearts and minds of the common people. Most feared soldiers in any uniform because they had always brought death and destruction. The whole basis of the elaborate and expensive pacification program that the United States attempted with varying levels of success and failure throughout the war was the need to befriend the villagers of South Vietnam. Such an understanding by

airmen would seem to have been fundamental to air operations, especially in South Vietnam. However, in many ways it was not.

Of import to this study is the fact that such notions ran, and still run, counter to basic and traditional theories of strategic airpower. In these Douhetian theories, centers of gravity must include industrial, geographic, and/or military targets. The kind of special air warfare described in AFMAN 2-5 was based on joint operations not only with military ground forces but also with civilian pacification personnel and in-country nationals. Therefore, the main job of the Air Force would predominantly range from airlift of supplies to friendly military forces and from humanitarian aid to local villages to tactical air and gunship CAS operations. This airpower would be a low and slow type, not high and fast. The use of strategic weapons—such as the B-52—and strategic missions would be limited under the tenets of AFMAN 2-5. It provided a set of suppositions and airpower concepts that would have taken time to plant and cultivate in the minds and hearts of airmen still almost totally immersed in traditional strategic theory and doctrine. Perhaps it was unreasonable to expect them to do so.

Equal in importance to AFMAN 2-5 was the Air Force's creation of the 4400th Combat Crew Training Squadron (CCTS) in April 1961 at Eglin AFB, Florida. A year later, the 4400th CCTS was absorbed into the Special Air Warfare Center, also located at Eglin. Both were the product of the Kennedy administration's genuine concerns over insurgency warfare. The 4400th CCTS (also known as Jungle Jim) trained and indoctrinated foreign airmen, including South Vietnamese, and developed counterinsurgency tactics and methodology. The center enlarged this mission in 1962 and even developed specialized tactics and procedures to counter guerrilla techniques.[86]

In late 1961, with the dispatch of air personnel to Vietnam during the Farmgate program, one would have expected that this exposure to insurgency to result in the inclusion of such issues in official doctrine, even if at a lower level. Although General LeMay's policy paper on guerrilla war acknowledged the existence of such conflict, it defined it as a "lesser" conflict and not a "different" kind of war.[87]

During the AFA national convention of 1962, the Special Air Warfare Center sponsored a symposium on limited war. Brig Gen Gilbert L. Pritchard spoke on counterinsurgency, which was later published by the Air Force. He discussed the formation of classic guerrilla strategies and tactics and proposed methods for countering these techniques and the forces using them. General Pritchard asked for "close coordination and cooperation of airpower with other forms of military power and with nonmilitary government agencies in a comprehensive and integrated campaign—including civic action and 'nation-building.'"[88] Clearly, the concepts of AFMAN 2-5 were already present in this speech.

Keeping a Historical Account

There were many researchers and historians in the Air Force who recognized important lessons. They recorded these lessons for future leaders to examine in both the Project Current Historical Evaluation of Counterinsurgency Operations (CHECO) and Corona Harvest publications.

Project CHECO

Project CHECO was created by the Air Force on 3 March 1962 "to secure an appropriate documentation of Air Force actions in SEA both for support of immediate on-going requirements and for eventual historical purposes." A lieutenant colonel, major, and civilian historian originally staffed the primary offices. CHECO proved to be a remarkably frank group of writers and researchers. Lt Col Donald F. Martin became project chief on 1 May 1964, and by the end of the year he and his staff had completed the first project—a six-volume *History of the War in Vietnam, October 1961–December 1963*.[89]

In early 1965 the project was reorganized, and the CHECO Division established with Col Edward C. Burtenshaw serving as chief under the Directorate of Tactical Evaluation, DCS Plans and Operations, Pacific Air Forces (PACAF), Saigon. The field chief in Vietnam was Kenneth Sams. In May 1965, officials changed CHECO's designation to Current Historical Evaluation of Combat Operations. They also moved it under

the PACAF Office of Information and determined that CHECO publications should include current history appraisals of all Air Force combat operations, not just counterinsurgency. Under the direction of the Air Force director of Plans in Washington, CHECO's ever-expanding staff processed requests from various commanders and Air Staff members for the creation of one-time studies of specific air campaigns, missions, or programs, as well as recurring, regularly produced histories of various units and programs.[90]

Two-man teams were to take two months to research and produce reports. Some included trips into the field with air components. None of the reports had any historical perspective, but the field teams collected large amounts of raw data that proved historically valuable in later years. By the summer of 1968, the staff in Saigon totaled five civilians, three officers, and two airmen who were often augmented by USAF Academy instructors during the summer months. At the same time, the term *Combat* in CHECO was changed to *Contemporary*.

By August 1968, the Air Force vice chief of staff had made CHECO the sole USAF document and data collection agency in SEA. Concurrently, members conducted dozens of interviews with key personnel. These documents later became a valuable source for books and articles written about the US air war in SEA, especially in South Vietnam. They also proved invaluable to airmen studying their difficult role in Vietnam during the war. While CHECO products were not used to formulate doctrine, the data in them was the component of both official and unofficial theory for many years.[91]

Corona Harvest

Of equal importance was the 1965 creation of Project Loyal Look, later known as Corona Harvest. The use of B-52s in Arc Light and the disagreement about its effectiveness played a direct role in the insistence, in late 1965, by Dr. Charles Herzfeld, director, Advanced Research Projects Agency, and Maj Gen Edward G. Lansdale, USAF, retired, special assistant to the US ambassador, Saigon, on a bombing and firepower survey along the lines of the World War II Strategic Bombing Survey. Based on this suggestion, on 23 November 1966 Air Force Vice Chief

of Staff Bruce K. Holloway assigned AU personnel to undertake the survey under the designation Loyal Look.[92]

Renamed Corona Harvest on 13 April 1967, AU Aerospace Studies Institute personnel were tasked to define lessons learned, measure airpower effectiveness, "assess the validity of current concepts and doctrine in light of airpower operations," and recommend modifications to existing concepts and doctrine to ensure they were more effective. The first results came in 1969 with the Battelle Memorial Institute publication of a chronological compendium titled *Communist Policy Towards Southeast Asia, 1954–1969*.[93]

Beginning in the summer of 1967, AU faculty and students undertook numerous projects, including research and writing of publications using JCS, National Security Council, SECDEF files, Air Force senior-level papers, and major commands (MAJCOM) documents. They spent three months researching specific topics of interest, receiving input from 19 commands and agencies covering 47 functional areas grouped into tasks, hardware, personnel, support activities, and plans, concepts, and doctrine. These publications—which focused on more specific topics—were divided into four phases: Phases I and II, 1954–64; Phase III, 1964 to mid-1968; Phase IV, mid-1968-end of 1969; and Phase V, 1970–73. The last two were added after the original project began.[94]

All publications were reviewed first by a panel of tactical and technical experts and later by a board of senior officers. The entire process proved very time-consuming and labor-intensive, expending more than 10,000 man-hours by 1970. Many of the opinions and conclusions ran counter to accepted Air Force policy; and when senior officers began their reviews of these reports, the "Pentagon Papers" were leaked to the public, thus making many in the Air Force nervous. In January 1971, Air Force Vice Chief of Staff John C. Meyer directed that the conclusions be redone in-house.[95]

AU was phased out of the process after completing 11 full reports and 45 backup working papers. From 1970 to 1973, PACAF produced 12 working papers. Little of the information was distributed to the USAF, much less to the scholarly community. In 1974 the new Vice Chief of Staff Richard H. Ellis

called General Momyer—the former TAC and Seventh Air Force commander, who had then recently retired—out of retirement to head a steering committee to publish, for public consumption, various conclusions from the Corona Harvest project so USAF personnel could use them. The committee assigned Lt Gen Felix M. Rogers, AU commander, to set up a review committee to declassify as much of the Corona Harvest data as possible. The primary working assignment eventually fell to three senior colonels who developed and disseminated 800 lessons learned and recommendations. The principal directors were Colonels John E. Van Duyn and Robert L. Gleason.[96]

Summary

While there were many positive lessons from which to draw in these reports, both men believed that the great efforts of Corona Harvest fell short in two important areas. Van Duyn and Gleason were particularly disappointed that the project was "unable to accomplish its principal purpose: a meaningful evaluation of overall airpower effectiveness." Colonel Gleason admitted, "one of the 'stark realities' of Corona Harvest was the identification of the fact that 'airpower effectiveness and airpower efficiency were two different things.'"[97]

They concluded that old standards of measuring performance had to change because sortie rates, the number of bombs dropped, and so on equaled efficiency, not effectiveness. Gleason observed, "halting 90 percent of an enemy truck LOC [lines of communications] would be less than 90 percent effective if the enemy only needed 5 percent of those trucks to sustain operations."[98] This was a lesson that was lost in the numerical glut of truck kills, which flowed forth during Commando Hunt. The lack of precedence for such measurements and the lack of enemy feedback or reaction to the bombing hindered reporting in Vietnam—a significant point in view of the fact that the enemy had as much as anyone to do with the American defeat.[99]

As General Momyer later declared, "the nature of the terrain, character of the fighting, and lack of conventional battle lines prevented the traditional measures of effectiveness of tactical air."[100] General Spike Momyer's appraisal is undoubtedly correct,

yet the Corona Harvest project—while not as useful as hoped for at the time—has proved a vital source of raw data for those writing about the air war in Vietnam. Like the CHECO reports, Corona Harvest papers and books have been the basis for 1970s, 1980s, and 1990s official Air Force publications and nonofficial academic writings. Both have had a great impact on Air Force doctrine and theory. Both have been at the center of the major changes made in leadership, technology, and doctrine within the USAF. At the time, this data had less effect on circumstances and policy decisions than they might have if the political atmosphere in the United States had been less charged. Even so, their effect on doctrinal and theoretical evolution in the post–Vietnam era is significant and worthy of examination by all scholars.

Such policy statements and early data collection led to the previously mentioned two-page chapter in the 1964 basic doctrine manual and the AFMAN 2-5 manual of 1967 on special air warfare. But, by 1965, the continuous fluctuation of policies in Vietnam by US political leaders meant that most of these ideas were ignored. The Air Force was heavily committed to prepare for what it thought would be a classic strategic bombing campaign it originally hoped would be against NVN. Original Air Force plans required use of B-52s as the centerpiece of the blitz it believed would destroy Hanoi's industrial capacity. The plan never unfolded the way airmen had hoped. Instead of strategic bombers pulverizing urban and industrial targets, President Johnson—fearing Chinese intervention and Soviet nuclear confrontation—used a cautious, measured air campaign employing tactical aircraft attacking the 94-target list. Airmen soon found themselves stymied by political restrictions and bombing pauses, the final pause ending Rolling Thunder in November 1968.[101]

Many airmen argued that such restrictions did not provide a true test of the classic theories, especially since B-52s had been relegated to ground support missions in the South. Critics pointed out that the basic components necessary to carry out an effective strategic air war were missing in NVN because it was not a modern industrial state.

Adding confusion to the airpower experience in Vietnam was the success of both 1972 Linebacker air campaigns, which

apologists viewed as vindication of the military policies used in Vietnam. Some even claimed that Linebacker was a clear sign that had they been given free reign from the outset, Linebacker-style raids could have quickly and successfully prosecuted the conflict. But this ignored the major changes in the nature and tempo of the war and the change in the international political environment and the growing limitations of US goals. The fact that Nixon became president in 1969 and that Dr. Henry A. Kissinger began the processes for détente during the Nixon presidency changed the focus of the war. For airmen, these changes meant that by 1971 Air Force doctrine would ease away from insurgency issues and move back toward conventional airpower theories of the 1950s.[102]

Menu Bombing

While the focus of the air war—at least under President Johnson—seemed to be Rolling Thunder, in total, NVN absorbed only about one-million tons of bombs or about 12 percent of all bombs dropped in SEA during American involvement in Vietnam. By contrast, approximately four-million tons fell on South Vietnam, three million on Laos, and 500,000 on Cambodia. As Nixon became president, political circumstances constrained him from initiating a new bombing campaign over NVN, even if he had wanted to. There were exceptions to these restrictions, such as "protective reaction strikes" against targets in NVN's southern panhandle and one-time raids such as Operation Proud Deep Alpha and the Son Tay raids; but for the most part, the air war shifted to South Vietnam, Cambodia, and Laos in 1969.[103]

The program for the withdrawal of US ground forces, later known as Vietnamization, had not yet been articulated; but as Dr. Earl H. Tilford Jr. notes in *Crosswinds*, "The US Air Force had disengaged itself spiritually (but not physically) from the war." The new SECAF Robert C. Seamans Jr. made this clear to the AFA convention on 19 March 1969: "There seems to be a trend toward viewing all national questions in the context of the frustrating struggle against aggression in Vietnam. . . . But there is no doubt that, however frustrated we are with the

conflict in Vietnam, the cost of failure to provide adequate forces for our security could be infinitely higher than the cost of Southeast Asia."[104] His remarks clearly mirrored the growing realization among senior leaders that, as important as Vietnam was, it was only one part of a larger strategic conflict against a competing ideology unfriendly to US interests.

While Commando Hunt I began under Johnson in November 1968, the secret bombing of neutral Cambodia—known as the Menu operations—began during the Nixon years. This campaign was directed at enemy base areas and logistics networks supporting operations in and around the region of South Vietnam nearest to Saigon. Washington hoped Hanoi would curtail its resupply of forces after Johnson curtailed northern bombing. Instead, MACV reported that the flow had increased and that more than 10,000 tons of arms had been sent to "Sihanoukville" in Cambodia and then shipped south. Nixon was determined to cut this flow to gain time to disengage from the conflict and to prevent any Tet-style uprising that might delay this process. Nixon knew he risked antiwar protests by bombing the North, so he decided to send a message to Hanoi by bombing the Cambodian sanctuaries.[105]

On 18 March 1969—after considerable internal debate—the first series of secret B-52 air strikes (code-named Breakfast) began against Base Area 353, a logistical supply and storage area three miles inside Cambodia. In May the president ordered further raids, dubbed Supper, Lunch, Dessert, and Snack—thus the name Menu bombing. B-52s flew 804 sorties against 140 targets in support of the ARVN Special Forces camp at Ben Het in Western Sector, II Corps. Raids continued for two months in both areas.[106]

While the Arc Light raids were open and above board, Menu missions were not. For the USAF these missions went beyond even normal covert operations. Personnel involved had to deceive USAF officials and falsify official records. The White House, the source of this deception, even kept knowledge of the operations from the Air Force chief of staff and the SECAF. The plans worked out by Col Ray B. Sitton, a one-time SAC officer, used Arc Light raids to cover the Menu raids. Formations were sent together—sometimes in the same groups, sometimes

at the same time. While Arc Light groups hit southern targets, Menu groups crossed the border. Menu pilots later falsified reports, stating they had bombed South Vietnam.[107]

Fourteen months after they began, the Menu raids were halted on 26 May 1970. The *New York Times* exposed the raids following the Cambodian invasion. During the raids, B-52s flew 3,630 sorties and dropped 100,000 tons of bombs. In addition, 763 Arc Light raids also supported US and ARVN forces as they overtly invaded Cambodia on 1 May 1970 near the Parrot's Beak and Fishhook areas. During 1970, 8 percent of USAF combat sorties went into Cambodia increasing to 14 percent the next year. This emphasis shifted in March 1972, when the NVA invaded the South. Overt bombing of Cambodia lasted from June 1970 to August 1973.[108]

In 1970 as the US disengagement policy expanded, so did the war. That year, neutralist and procommunist Cambodian Prime Minister Norodom Sihanouk was overthrown. The Cambodian government, with its inadequate military, now openly supported the United States; but the Communists were not about to give up their Cambodian bases. Cambodia was now in the war, the goal of US policy was further jeopardized, and the only potentially positive aspect of Menu operations was that it possibly prevented a large-scale NVA attack that would have allowed the US political right or South Vietnamese President Nguyen Van Thieu to block US withdrawal. However, to date there is still no hard evidence that any such attack was imminent.[109]

Commando Hunt Operations

In the early 1950s, as the Vietminh struggled to dislodge the French from SEA, they built a rudimentary network of infiltration roads to supply their units to the South. After the French left and Vietnam was divided at the 17th parallel, the new leadership in Hanoi formed contacts with southern factions to reunify Vietnam under a communist regime. In 1957 communist guerrilla units supported by the North were established; and over the last two years of the decade, the NLF began to act as the political arm of this antigovernment movement in South Vietnam. Hanoi also created the 559th Transportation

Group to furnish the southern guerrillas with material support from the North. These dirt roads and footpaths were the origins of what later became known as Ho Chi Minh Trail.[110]

By 1964 the circumstances in the South were in a state of flux; the intractable Catholic strongman Ngo Dinh Diem had been overthrown and killed during a coup in November 1963. The focus of US aid and hopes for preserving an anticommunist southern state in Vietnam, Ngo's demise had left South Vietnam with a leadership void and soon near total collapse. At the same time, a special northern mission to the South, led by Col Bui Tin, determined that "there was little hope that the insurrectionists could, at their current level of support from the north, prevail against the Republic of Vietnam, which [is] . . . the object of lavish American subsidies." Hanoi determined to up the ante and as Washington made plans to commit combat forces, NVN decided to send its regular forces to fight in South Vietnam.[111]

Between April and December of 1964, more than 10,000 NVA, including the first tactical units, traveled South to support the VC. At the same time, northern engineers, led by Col Dong Si Nguyen, began to upgrade the road network through Laos that would become known as the Ho Chi Minh Trail. In spite of the inhospitable terrain in the Laotian panhandle—or Steel Tiger as the United States dubbed the area—the NVA road builders carved roads through mountain passes from NVN into Laos during good or bad weather, across the limestone cliffs, and through the mountains as high as 5,000 feet. They pushed through jungles, cut through bamboo forests, and forded rivers like the Xe Pon. As Stanley Karnow writes, "the Communist had added a new dimension to the struggle." But this was only the beginning, since the men and supplies that would move down the new infiltration routes in 1964 were "a trickle compared to the numbers three years later, when they were pouring into South Vietnam at the rate of twenty thousand or more per month."[112]

By 1971 the 559th Transportation Group, now the 559th Military Region, had expanded the Ho Chi Minh Trail from a fragile net of jungle footpaths into thousands of miles of well-tended motor roads. Hanoi subdivided southern Laos into 15

semiautonomous military districts or Binh Trams, each with a commander responsible for all functions, including control of transportation, engineer, antiaircraft, liaison, and support battalions. The transportation battalions moved supplies through each district; engineer battalions built and repaired roads, and moved supplies if needed; liaison battalions managed the infiltration of personnel along trails separate from those used for supplies; while support groups provided food, shelter, medical services, and other staff functions.[113]

In 1964 US leaders realized these supply routes had to be closed by aerial interdiction, but until November 1968 air assets were busy with Rolling Thunder. Most US efforts were aimed at southern ground operations while US ground forces attempted to destroy northern units and supplies once they reached South Vietnam. Laos was bombed, but the full brunt of US airpower was not felt in the Laotian panhandle until after Tet revealed the importance of the trail.

On 31 October 1968, Johnson called a halt to US bombing operations in NVN, in an effort to restart negotiations in Paris. The next day, CINCPAC Adm John S. McCain Jr. communicated the halt to forces in SEA at 2100 hours Saigon time. An Air Force officer, Maj Frank Lenahan, in an F-4C flew the last Rolling Thunder mission over the panhandle area at 1930 hours from the 8th Tactical Airlift Wing.[114]

Ironically, on 15 November 1968, Commando Hunt I became the first of seven such operations, each lasting approximately six months and alternating from the winter/spring dry season (November–April) to summer/fall monsoon/wet season (May–September). Attacks concentrated on four primary kinds of targets: trucks traveling on the Ho Chi Minh Trail, using primarily AC-119 and AC-130 gunships; the road network, including truck parks, rest areas, et cetera; terrain, such as passes, river fords, and jungles; and antiaircraft artillery (AAA) and SAM sites which the enemy placed along the route. The USAF used laser-guided bombs on the later targets—usually delivered by tactical air (TACAIR) as well as bridges. The B-52s were particularly effective against the passes and stationary targets, such as trucks congregated at choke points.[115]

The Seventh Air Force bombed using one-square-mile boxes labeled A, B, C, and D representing the Ban Kari, Mu Gia, Ban Raving, and Nape passes. An average of 27 B-52 sorties per day attacked these boxes, while by Commando Hunt V tactical aircraft averaged 125 sorties per day. The Igloo White sensor system—created by Task Force Alpha at Nakhon Phanom RTAB in December 1967—guided the attacks. Originally set up to target enemy troop movements around Khe Sanh, it worked well for the Commando Hunt truck-killing campaigns. During 1968, B-52s supported this operation with 838 sorties in Laos, and 156 sorties to support Steel Tiger South below 16' 30º north latitude. They averaged 21 sorties per day and flew twice as many during specific surge periods.[116]

While these operations worked well at first, USAF schedules became predictable, and the enemy soon adapted their movements accordingly. Generally, the enemy used the trail from 0400 to 0800 and 1600 and 2000 hours which "coincided with shift changes at US bases and with changes in the deployment of aircraft. Fighter-bombers usually arrived on station after dawn, at around 0800. Pilots preferred to bomb after the sun had fully risen to avoid visual misperceptions more common in the half-light of dawn or dusk." It was better to be shot down early in the day—pilots had a better chance of rescue and would not have to risk spending the night in the jungle.[117]

Initially, Commando Hunt operations were confined to a 1,700 square mile sector of Laos bordering South Vietnam. Commando Hunt I employed 40 percent of its sorties to cut the narrow roads of the trail, while 35 percent attacked trucks and storage areas and 10 percent attacked antiaircraft sites. The campaign ended on 30 April 1969, when analysts decided that US air forces had inflicted enough damage to force the enemy to use "water routes including the Cambodian port of Kompong Som." By then average monthly tactical sortie levels, which had been 4,700 in October, had risen to 15,100 in December. The B-52 levels began at 273 sorties in October and rose to 600 by December. During 1968, B-52s flew 3,377 sorties over Laos; but as one author put it, "notwithstanding their rising material losses, the Communists doggedly continued to send a substantial flow of supplies through Laos into South Vietnam."[118]

As the southwest monsoon season began in May 1969, US aircraft attacked the Laotian panhandle again, this time using B-52s to drop 500 lb and 750 lb bombs, which caused mud slides along the wet mountain passes and helped the rains close the roads. The enemy used frequent bad-weather-bombing pauses to rebuild the roads and to stage troops, trucks, and supplies along the North Vietnamese border. They also imported more and newer trucks, began construction of a petroleum, oil, and lubricants pipeline, and set up AAA defenses. With bombing of the North curtailed, the enemy built up its convoys in safe havens. As Seventh Air Force commander Gen George S. Brown put it, "the enemy had a 'free ride' to the borders of Laos and South Vietnam."[119]

As the next dry season dawned, the third campaign used seismic and acoustic sensors to detect truck movements—sensors that were unaffected by darkness and allowed spur-of-the-moment gunship attacks to catch the enemy exposed. From November 1969 to April 1970, B-52s supported Commando Hunt III; during April and May, they also supported ground operations in both Laos and Cambodia. However, "during Commando Hunt III the tempo of air operations declined gradually." In early 1970 intelligence estimates indicated that infiltration was down more than 50 percent. With growing domestic dissent and the ever-draining expense of what seemed to be a never-ending war to consider, Nixon cut the sortie ceiling on 26 February 1970, as Commando Hunt III wound down.[120]

What most US analysts apparently failed to understand was that the enemy was rebuilding and waiting. In this guerrilla war the enemy required almost no logistics lines; their troops lived off the land, the people, and in this case foreign resupply of vital materials. Throughout the Second Indochina War the VC and NVA often pulled back from conventional combat, or even uprisings like Tet, to conserve their men and supplies while they negotiated and prepared for later campaigns. Such was the case between 1970 and 1972.[121]

As Commando Hunt operations unfolded for the fourth time, B-52s were diverted to Operation Barrel Roll in northern Laos, which supported Maj Gen Vang Pao and his US operative forces—the Hmong—in their ever-widening struggles with the

Pathet Lao and the PAVN. In late 1970, as Commando Hunt V began, intelligence discovered vast stockpiles of NVA supplies around Tchepone at the upper end of the trail, a supply hub for enemy forces headed south. Fearing this was the buildup for an attack on Thau Thien and Quang Tri provinces in northern South Vietnam, US leaders attacked the depot using ARVN ground troops and US aircraft. Like the earlier bombing of Cambodia, this Laotian incursion was designed to buy time for the withdrawal of US forces from Vietnam.[122]

Phase one of the Laotian invasion, code-named Lom Son 719, commenced on 30 October 1970 as US aircraft cleared Quang Tri and set up a logistics base on the Laotian border near the Khe Sanh and Vandegrift Marine bases. The USAF delivered 20,000 tons of supplies and more than 12,000 ARVN soldiers in preparation for the ground attack. Phase two began on 8 February 1971, and by the 23d more than 17,000 ARVN had entered Laos supported by gunships, TACAIR, and 399 B-52 sorties.

On the 25th, 24,000 NVA combat troops counterattacked. This larger-than-anticipated force was also supported by 120 tanks, large numbers of AAA batteries, and dozens of mortars and artillery pieces. The ARVN offensive bogged down on 3 March, and a week later another enemy counterstroke forced the ARVN ground commander Lt Gen Hoang Xuan Lam to order a withdrawal. The retreat soon turned into a rout. Aided by US helicopters airlifting survivors and B-52 strikes covering the withdrawal, most of the ARVN were extracted by 24 March.

BUFFs flew 1,358 sorties and dropped 32,000 tons of bombs, while TACAIR flew more than 8,000 sorties. Some bombs were used to blast open landing zones (LZ) for helicopters supporting the ground advance toward Tchepone. The operation officially ended on 6 April 1971. US helicopter crews saved thousands of ARVN soldiers, but the cost was high, with 107 helicopters lost and 600 damaged. The United States lost 176 killed, 1,042 wounded, and 42 missing—many dying to saving their South Vietnamese allies. Enemy losses—mostly due to air strikes—included 14,000 killed and 4,800 wounded as well as 20,000 tons of food and ammunition, 156,000 gallons of fuel, 1,530 trucks, 74 tanks, and 6,000 individual weapons captured or destroyed. The ARVN lost 1,519 killed; 5,423

wounded; 651 missing; 75 tanks; dozens of personnel carriers; 198 crew-served weapons; and 3,000 individual weapons. Perhaps worst of all, during the ARVN retreat they abandoned large quantities of undamaged weapons and supplies, later salvaged and used by the enemy.

Commando Hunt VI lasted from May to October 1971 as a diminished operation. Meanwhile, the enemy flow of traffic down the trail grew markedly. The Communists added 140 miles of new roads; and by October they had more than 2,170 miles of single-lane roads, multi-lane roads, parallel routes, bypasses, and spur roads in Laos. They also added 344 AAA batteries, new MiG bases in southern NVN, and dozens of SA-2 SAM sites, most of which were along the Laotian–North Vietnam border. One estimate placed 96,000 NVA in Laos, 63,000 in Cambodia, and 200,000 in South Vietnam. As a result, concerned US leaders planned one final massive campaign.[123]

Plans for Commando Hunt VII called for US air forces to bottle up the enemy's transport system within Laos, using B-52s to close the passes leading from NVN into Laos and then from Laos into Cambodia and South Vietnam. Planners hoped to force enemy vehicles to congregate in truck parks where they would be attacked and destroyed. Concurrently, BUFFs would bomb other roads to divert traffic to specific routes where gunships and tactical bombers could attack exposed vehicles with predictable success. These were the plans but as we have seen, operations do not always go as planned.[124]

At the outset, plans had to be altered when US intelligence discovered 310 additional miles of uncharted main roads, as well as hundreds of miles of small back-road cutoffs and bypasses that helped to keep supplies rolling. In the early years, the enemy built roads along the paths of least resistance—usually near rivers or in valleys—which made them vulnerable to flooding and mud slides. As they gained experience and better equipment, roads were built at higher altitudes. Most were 12–15 feet wide and surfaced with gravel, logs, or bamboo where drainage was poor; while this network could not sustain heavy traffic during the rainy season, some traffic always could pass through.[125]

Road maintenance during Commando Hunt VII required 96,000 support personnel—an increase of 35,000 from 1971. When Laotian roads were unusable during the rainy season, the enemy partially compensated by developing rivers as alternative means of transportation because the rains that made the roads impassable provided the rivers with powerful currents to carry supply containers rapidly over long distances. The enemy often used the Kong and Banhiang rivers, whose tributaries flowed across the DMZ into Laos, locating transshipment points several miles apart where supplies were unloaded using nets and booms and stored for transport by trucks or porters.[126]

The enemy also constructed pipelines. Three ran into Laos from Vinh in the North Vietnamese panhandle near dock facilities, where Communist bloc tankers docked, through the Mu Gia pass to points along the northern parts of the trail and serviced truck parks and other facilities in and around Ban Phanop. Another ran "through the Ban Raving Pass to a distribution point near Tchepone." From here other lines "extended to the Lao Bao Pass and the A Shau Valley, both major entrances into South Vietnam." They were made of Soviet-imported plastic pipes connected with metal couplings. These Soviet-made pumps pumped motor oil, gasoline, diesel fuel, and kerosine. A variety of "petroleum products could be sent along the same line. Water mixed with detergent separated the shipments and prevented contamination."[127]

Of all the Commando Hunt operations, Commando Hunt VII (1 November 1971 to 31 March 1972) witnessed the greatest use of B-52s and also employed the latest airborne technology and weaponry available. OV-10 forward air control aircraft directed laser-guided bombs dropped by fighters directly on their targets. Target detection had been upgraded on most US aircraft, especially the AC-119, AC-130, and B-57Gs. Other upgrades included low-light-level televisions, illuminators, beacon-tracking radar, and infrared sensors. New F-4 fighter aircraft equipped with long-range electronic navigation (LORAN) position-fixing bombing systems provided all-weather bombing capabilities.[128]

Porters Transporting Supplies

Porters are seen carrying supplies along one of the jungle footpaths that made up the Ho Chi Minh Trail.

Commando Hunt VII developed in three phases with initial operations centered in the Steel Tiger areas of Laos. Phase one began when US aircraft— primarily B-52s—struck the Mu Gia, Ban Karai, and Ban Raving passes as well as areas in the western DMZ. Concurrently, fighter-bombers with laser-guided bombs attacked earth-moving equipment repairing roads. As the roads dried, the B-52s struck the southern routes at the Ban Raving pass and western DMZ to detour traffic through the northern Mu Gia and Ban Karai passes.[129]

As planned, the B-52s bombed target boxes. The Mu Gia pass contained the “A” or Alpha boxes totaling 13 x 18 nautical miles (NM). The Ban Karai pass was designated with “B” or Bravo boxes that totaled 14 x 14 NM, while the Ben Raving pass had “C” or Charlie boxes that totaled 20 x 21 NM. The “D” or Delta boxes, located in the western DMZ, totaled 5 x 12 NM. During the first three weeks tactical aircraft and B-52s dropped 14,400 instantaneously fuzed 500 lb bombs, 17,100 750 lb bombs, as well as a few dozen 2,000 lb laser-guided bombs, MK-36 magnetic-influence mines, and cluster bomb unit antipersonnel mines.[130]

The initial bombing appraisal determined that enemy traffic had been slowed some of the time in some places. But by 4 November intelligence indicated that the Mu Gia pass roads were already being repaired, and that the traffic flow was near normal levels. During 10–17 November, bombing resumed, again making major cuts in the passes. Even so, the enemy proceeded to build up supplies in preparation for an offensive against South Vietnam.[131]

During phase two, which began in late November, US aircraft struck the enemy units as they moved south. Roads were cut by B-52s, which left large craters and created choke points and blocking belts. As enemy truck traffic backed up, USAF fighters attacked with laser-guided bombs, using data gathered from Task Force Alpha sensors. They also seeded the area with air-dropped mines. As enemy units attempted to clear the mines or repair the roads, further attacks caught them exposed, causing great destruction.[132]

During Commando Hunt VII, three major blocking belts were created—the Tchepone belt, composed of six blocking points

created from 23 November 1971 to 22 January 1972; the second, 40 miles south of Ban Bak with two points formed 24–26 December; and the third belt near the Chavane pass first set up on 15 February and again on 2 March. The third belt proved nearly useless because the enemy abandoned this route at the outset. In the Tchepone belt, three blocking points were retained effectively until 2 February; however, point 427 on Highway 92C was never actually closed because the NVA ignored other blocking points and concentrated on that one spot. Even though traffic slowed because of detours, the belt was always open. In spite of heavy bombing, neither of the Ban Bak points was closed for long. According to Seventh Air Force analysts, "the North Vietnamese were able to keep both points breached most of the time."[133]

The third phase began in early 1972 and shifted attacks to exit points from Laos into South Vietnam and Cambodia as well as against enemy AAA batteries. US TACAIR flew 31,500 sorties, half by the USAF, while BUFFs flew 3,176 more; they lost 13 planes. Official reports claimed that large numbers of enemy vehicles were destroyed or damaged, thousands of NVA killed, and tens of thousands of tons of supplies destroyed. US officials declared the operations a success that prevented another Tet-style uprising.[134]

On 31 March 1972, Commando Hunt came to a halt a day after Senior Gen Vo Nguyen Giap launched the Easter offensive into South Vietnam since "the resources of the US Air Force in SEA were insufficient, even with considerable augmentation, to continue interdiction in Laos while seeking to blunt the enemy's bold thrust."[135] Concurrently, Seventh Air Force officials proudly claimed 4,727 truck kills and that only 5,024 of the 30,947 tons of supplies sent into Laos ever reached Cambodia or South Vietnam. Yet Brig Gen Alton D. Slay, who directed the operation, did not agree with this evaluation. He later declared that several factors explained, "the failure of the interdiction effort to produce a higher degree of success."[136] Slay's deputy—Brig Gen Richard G. Cross Jr.—echoed this in his end-of-tour report when he wrote, "this interdiction effort failed to prevent the enemy from positioning sufficient supplies to initiate an all-out offensive against South Vietnam."[137]

For all the efforts of three and one-half years, Commando Hunt left many questions about its value. It probably helped buy time for the United States to withdraw its ground forces and begin Vietnamization, but as Dr. Tilford points out, "the strongest evidence against the reputed success of Commando Hunt was NVN's launching of a major invasion against South Vietnam in late March 1972." There are those who argue that the supplies and troops used in 1972 "had been carefully husbanded and stored in Laos over a period of four years." Clearly many enemy soldiers and tons of supplies came south between the end of Tet and the start of Commando Hunt VII, which means that if Commando Hunt VII was a success, then the other Commando Hunt operations were not since the prepositioned supplies came through during the earlier operations.[138]

Perhaps the greatest controversy comes from the vast claims of trucks destroyed. If one follows the official indices for success in all the operations (i.e., truck kills), then it should have been impossible for the enemy to ferry enough supplies south to launch any kind of offensive. After Commando Hunt V, MACV officials created a flurry of controversy when they estimated that 16,266 trucks had been destroyed and 4,700 damaged. In retort, the CIA pointed out that such a number "more than doubled the total number [of trucks] estimated in all of North Vietnam and Laos."[139]

Seventh Air Force officials claimed that US aircraft had destroyed 11,009 trucks and damaged 8,208—well above the 4,727 destroyed and 5,882 damaged in Commando Hunt VII. In both cases, the criteria for truck damage claims were haphazard. If pilots saw a truck get hit and stop, they claimed it as destroyed. This basically proved nothing; when attacked, most truck drivers abandoned their vehicles to seek shelter. Thus most trucks hit by gunships might have holes in them, but they still might be usable. Later tests by US vehicle units proved that unless a truck blew up or burned, it could probably still be used. Besides, the enemy had many repair facilities along the trail, and trucks were quickly repaired.[140]

It is worth noting that NVN was importing trucks from the Soviet bloc at a rate of between 4,500 in 1968 to around 10,000 in 1972, and "even if the U.S. Air Force destroyed

4,727 trucks during Commando Hunt VII, such losses were probably insufficient to disrupt the logistical operations of the North Vietnamese for extended periods, if at all." The Seventh Air Force estimated that at the beginning of Commando Hunt, there were 2,000 to 3,000 trucks in service along the trail. This estimate was probably based on how many trucks it would normally take to operate the infiltration routes. It ignores the fact that others—such as Task Force Alpha, using photographic reconnaissance—indicated that the Communists had about 9,850 trucks in storage. Eduard Mark, in his book *Aerial Interdiction*, argues that "even if it be assumed that the 3,000 [trucks] initially in Steel Tiger were destroyed twice over (which was not claimed), the North Vietnamese would still have been able to replace the trucks destroyed with those in reserve at the beginning of the dry season, to say nothing of those subsequently received from the Soviet Union and other Communist countries."[141]

The number of trucks getting through the trail was important mainly in regard to how much materiel got through to enemy troops in the South. Using sensors for detection, US analysts determined how many supplies were getting through from the number of trucks; they multiplied each truck by three tons in the wet season and by four tons, or the maximum payload of the communist trucks, when the roads were completely dry. The total number of estimated trucks was multiplied three or four tons to predict the tons of materiel starting out. Truck destruction, based on these figures, was then reduced by the number of trucks destroyed; and the throughput was then determined. Three tons were subtracted for each southbound truck hit, while 1.5 tons were subtracted for each truck in a truck park. An additional ton was subtracted if the truck was moving, but only one-half ton if it were stopped. If the direction of the truck could not be determined, the subtraction level was divided by two. An additional .2 tons was subtracted for observed fires at storage areas and one-half ton for an explosion.[142]

The entire technocratic process was generally denounced by most intelligence operations, including the CIA, which dubbed it playing the numbers game since most of the factoring numbers

were purely arbitrary. Based on their own sources, usually agents inside the enemy forces, they concluded that “Communist forces in South Vietnam were only occasionally inconvenienced by interdiction.” The sensors were vulnerable to the damp climate and later to enemy circumvention, their reliability was and is suspect. The best evidence is that by March 1972, 200 NVA tanks entered South Vietnam almost entirely undetected. The assumption of great materiel loss when a truck was disabled or damaged is also doubtful not only because trucks were easily repaired but also because of the simple, but effective, precautions the enemy took to save supplies, such as covering precious southbound supplies with bags of rice. If the trucks were hit with bullets or fragments, the bags absorbed them; and as long as the truck did not burn even if it was inoperable, the supplies got through.[143]

Thousands of young men and women lived in work camps near the trail and quickly repaired it at night and during bad weather, extending the road network into small auxiliary roads through the dense jungle and underbrush, which diversified and actually improved it. The road system was too redundant and too easily repaired to be a good target. The communists also built an entire alternate route system in western Laos that was almost uncharted and nearly devoid of sensor coverage. Moreover, the years of bombing so defoliated the landscape that it “probably made it easier for the North Vietnamese to keep the passes open.” B-52 bomb patterns were so evenly distributed through a box that, on average, few bombs actually struck the narrow roads. Where they did, the enemy built temporary bypasses in defoliated areas where the soil, “tilled by thousands of bombs, had become easier to work.”[144]

The enemy also traversed waterways and coastal water routes not often scrutinized or covered by US aircraft. The enemy floated, down the rivers, barrels and plastic bags of supplies that barely broached the surface and were difficult to detect from the air. Dams and channeling walls were also hard to hit and easy to repair, since after bombings the enemy collected the scattered dam stones, piled them back, and repaired the dams.[145]

The sensors, though effective at first, were soon discovered by the NVA forces who devised dozens of ways to circumvent or trick the sensors and those listening. Originally, the Commando Hunt VII sensor field consisted of 160 strings arrayed to monitor 33 potential target areas. Each string was to have eight sensors, five air delivered seismic intrusion detector (ADSID) and three acoustic seismic intrusion detectors (ACOUSID). However, Seventh Air Force experts—analyzing precampaign intelligence data—determined that the enemy had expanded its route structure. Thus at the last minute, Seventh Air Force commanders ordered Task Force Alpha to reduce the number of sensors in each string to five, three ADSIDs and two ACOUSIDs, which meant a reduction in accuracy but a necessary reduction to assure coverage.[146]

Sensors had a short 60- to 160-day life span under normal conditions. The first strings were seeded on 8 September 1971; but Commando Hunt VII did not begin until November, and many strings were not functioning. To add to the predicament, Commando Hunt VII was competing for sensors with Operation Island Tree, which was attempting to detect the infiltration of enemy soldiers. As the Commando Hunt operations began, Task Force Alpha units were reseeding at a rate of about nine per day, which greatly reduced the overloaded computer's data output accuracy.

Moreover, the communists soon realized that seeding aircraft dove differently than bombing aircraft, and they could fix the general location of many of the sensors. Some were neutralized, but more often they opted to deceive rather than disable the sensors. To fool the Black Crow ignition and exhaust detection sensors, enemy personnel wrapped their ignition systems in aluminum foil to suppress electromagnetic emanations. To counter infrared sensors, they placed layers of banana leaves and bamboo over hot spots on vehicles.[147]

The air-dropped magnetic-influenced mines used by the USAF proved to be just as ineffective, since they had been designed to work against steel-hulled ships and thus had limited effect on wooden boats. The NVA most often cleared mines that formed the blocking belts by throwing rocks tied to ropes or cords into the minefield. As they retracted the ropes, they

caught the trip wires on the wide-area antipersonnel mines, causing them to explode. Sappers disarmed the pressure-sensitive gravel mines by picking them up and detonating them elsewhere. Many of these mines were not functioning due to the extreme dampness of the Laotian jungles. Once through these barriers, it was easy for sappers to defuse the MK-36 magnetic-influence mines. Whenever the NVA were able to marshal resources, they cleared blocking points in "fewer than twelve hours."[148]

During Commando Hunt VII, enemy air defenses were far more vexing than during previous campaigns. The Seventh Air Force determined that the enemy had 345 23- to 57-millimeter (mm) guns at the outset of the campaign. This number increased to 554 during the height of operations, six of which were 85 mm weapons and one a 100 mm gun. Task Force Alpha disagreed with these numbers, estimating that the enemy had 600 to 700 guns by the end of Commando Hunt V and 1,500 at the height of Commando Hunt VII. Afterward, PACAF reported that a total of 18 aircraft were shot down over southern Laos: nine F-4s, five OV-10s, one Navy A-4 Skyhawk, one Navy A-7 Corsair II, one AC-130, and one A-1 Skyraider.[149]

One other major problem was the appearance of enemy SAMs near the target areas. During Commando Hunt V there had been only 49 firings reported, while during Commando Hunt VII there were 153. On 9 November, when Air Force intelligence sources first detected SAMs in the area, officials had to curtail B-52 operations until the threat could be assessed. TACAIR could not keep the route package closed because only the B-52s' bombing caused the necessary cratering. Enemy traffic surged south as the roads dried and the passes opened. The B-52s returned to bombing on the 20th but once again were called off because one MiG-17 fired a single missile at the vulnerable old BUFFs. B-52s returned again on 21–22 November for the final days of phase one, but by then many enemy convoys had already escaped south.[150]

Lost sortie rates due to SAM threats continued during phase two. Their real danger was demonstrated on 12 December over the Mu Gia pass when an F-105 was destroyed by a Soviet-built SA-2 with a 24-mile usable range. Not only did the B-52s

have to be cautious but also did the AC-130. On 13 January 1972, with SAMs located near Tchepone, the lumbering gunships were withdrawn from the vital central Steel Tiger region. Only after intensive fighter-bomber attacks from 11 to 15 January reduced the threat did the AC-130s return. Even so, on 29 March, 10 miles north of Tchepone, an SA-2 shot down an AC-130, killing the crew of 14. Damage to three other AC-130s and three AC-119s by AAA fire during March led to a standdown by gunships until the operation ended on 31 March.[151]

As phase two shifted south and west in early December, forcing the enemy to take longer routes, the NVA shifted some of their SAM sites; thus, on 7 December B-52s were withdrawn from operations around the Mu Gia and Ban Karai passes and neither target was attacked again during Commando Hunt VII, except for attacks on the Ban Karai, on 9 and 10 March 1972. Enemy road building had increased so dramatically by January 1972 that even if the B-52s had been available, it is doubtful they could have "kept pace with it."[152]

Not only were the B-52s pulled off bombing passes and routes in Laos for extended periods of time but the most effective antivehicle weapon—the gunships—also stood-down. Equally important was the USAF's expenditure of 4,066 fighter-bomber sorties attempting to suppress enemy AAA and SAM air defenses. Since fighter-bombers flew 4,209 sorties against vehicular targets, nearly one-half of all fighter-bomber sorties were diverted from their primary interdiction missions. While MiG-17s posed a lesser threat, their mere presence forced the USAF to plan for potential attacks, again diverting attention from the primary task.[153]

The enemy also sought the shelter of night when US fighters and bombers did not usually fly. The United States soon overcame this tactic by using the AC-119K, AC-130A/E fixed-wing gunships. The AC-119K Stingers used their four 7.62 mm Gatling guns, their two 20 mm cannon, and infrared sensors to run up a remarkable truck kill ratio. Even more awesome were the AC-130s with their two 40 mm cannon and two 20 mm cannon. Some later models even were fitted with a 105 mm cannon, which replaced one of the 40 mm cannons. They carried a wide range of sensors, such as "infrared detectors to

AC-119G over Tan Son Nhut Air Base, RVN

The gunship was a key weapon used to stop enemy infiltration along the Ho Chi Minh Trail.

pick up the heat of engines and exhaust, low-light television, and ignition detectors to register the electrical emanations of operating internal combustion engines."[154]

The United States used 16 AC-119s and 18 AC-130s with the 130s, claiming 7,335 truck kills, and the 119s 940, compared to 461 by B-57s and 1,873 by fighter-bombers. Sensors made the AC-130s particularly deadly at night, but the enemy soon discovered that these sensors were blinded by daylight and heat which meant that they struggled to visually fix targets at dawn and at dusk. As Slay later noted, "we never did get a handle on the early movers at dusk and the late movers at dawn."[155]

US bombing efforts were never well coordinated; each group of attackers, gunships, night raiders (B-57Gs and A-26 Invaders), TACAIR, B-52s, and Task Force Alpha—all pulled in opposite directions. In typical bureaucratic fashion, during this time of withdrawal from Vietnam, each unit sought to justify its own existence and funding. But most damaging was the bombing halt over NVN that began in late 1968, which gave the enemy units a head start along the early part of the trail

and staging areas from whence they fanned out all over the bypass roads of Laos.[156]

As French officers and authors had emphatically suggested in the mid-1950s and USAF authors declared in the 1960s, aerial interdiction—especially in the jungles of Vietnam—was difficult. Commando Hunt consistently experienced many of the frustrations of which these early writers had warned; and even though the B-52 and TACAIR raids seemed to destroy great numbers of trucks, they never seemed able to stem the flow of enemy supplies into South Vietnam. Since the enemy was able to stage vast quantities of supplies, tens of thousands of troops, and 200 tanks in preparation for launching the Easter offensive of 30 March 1972, even the two most ambitious operations—Commando Hunt V and VII—were not totally successful. This was due in part to the ever-growing (96,000 by the 1970s) and well-organized enemy repair forces stationed along the extensive and repetitive paved roads, dirt trails, footpaths, and waterways that made up the trail. During the late 1960s and early 1970s, keeping the infiltration routes (including waterways) open became a national obsession in NVN.[157]

Spotting well-disguised enemy movements in dense jungles, fog-shrouded mountains, and the vast, sparsely populated regions of Laos and Vietnam proved difficult for US pilots. The torrents of the monsoon season also meant that the enemy had periodic relief from bombing raids. Not only finding the targets but also maintaining blocking belts and choke points as well as actually destroying trucks proved perplexing. The massive resupply of trucks from the Eastern bloc, and the growing sophistication of the enemy's massive petroleum, oil, and lubricants pipeline complex throughout NVN and Laos made it nearly impossible to entirely cut off Communist movements into South Vietnam. Again, and it cannot be overstated, one of the major reasons for Commando Hunt's lack of success was the fact that it began as Rolling Thunder ended, giving the enemy a head start down to the Ho Chi Minh Trail.[158]

For the Air Force, the NVA invasion of 1972 changed the air war again. With the need to resupply 200,000 combat troops, the enemy employed long logistics networks that soon experi-

enced the full fury of US airpower. In 1972, Linebacker I and Arc Light raids in South Vietnam would be the deciding factors in preventing the fall of the South.

Air Force Theory and Doctrine in the Early 1970s

The five and one-half years from mid-1965 to late 1971 not only witnessed a change in the pace and nature of the war but also witnessed a change in official Air Force theory and doctrine. By September 1971—when the next basic doctrine (AFMAN 1-1) appeared—the Vietnam War was becoming more conventional, and airpower emphasis had returned almost completely to the strategic focus of the 1950s. The Commando Hunt and Menu operations of 1968 through 1972 included numerous strikes by Big Belly B-52s carrying large bomb loads. The big bombers had been one of the main components of these interdiction efforts, especially during Commando Hunts V and VII; and as the new decade began, airmen determined that the best way to deal with the frustrating and bitter experiences of Vietnam was to reemphasize traditional theory and doctrine. Yet the 1971 basic doctrine manual was not a complete reversal of the mid-1960s publications, it was a move in a new direction.[159]

The 1971 basic doctrine manual had a final chapter on nonconventional air combat but did not focus on airpower in counterinsurgency. Instead, its focus was on the broader subject of Air Force special operations. By 1971 special operations had become the latest catchphrase for insurgency conflict and was, in this case, designed to replace the old phrase *special air warfare* used in the 1967 AFMAN 2-5. The new 1971 AFMAN 1-1 also introduced yet another new term, *foreign internal defense,* meaning "counterinsurgency." While the examination of internal defense covered only one paragraph, it reiterated the earlier assertion that air operations should be coordinated with civil actions and surface force operations in a coordinated military-civilian campaign to eliminate the causes of popular discontent and create a sense of national unity. Here again, the B-52 was not the optimum weapon. According to AFMAN

1-1, the BUFF's primary role was, as the authors believed it should have always been, to provide a strategic nuclear strike against the Soviet Union.[160]

It was these concepts that led airmen through the last year of active combat. By 1972 President Nixon seemed no closer to a settlement than his predecessor, in spite of the diplomacy of Dr. Kissinger and the withdrawal of nearly 500,000 US troops from Vietnam. On 30 March, as Nixon considered his next move, 120,000 communist regulars supported by artillery and 200 tanks invaded South Vietnam, threatening to overrun America's ally. The invasion violated agreements between Washington and Hanoi when Johnson ended the northern bombing in 1968; but while Nixon was concerned that South Vietnam might fall, he now had an excuse to discard restrictions that prevented him from fully using US airpower.[161]

The Easter offensive lasted from 30 March to 16 September 1972. The enemy named it the Nguyen Hue offensive, in honor of the Vietnamese emperor who had destroyed Chinese invaders in 1789. Using the rainy season to avoid US air attacks, General Giap ultimately committed 14 divisions and 26 separate regiments to the invasion. One division was placed in northern Laos to protect supply lines, while four others remained on the border in NVN in reserve.[162] Communist goals were to erode flagging US public war support during an election year, to counter South Vietnamese successes in rural areas since 1969, and to win the war before Nixon's détente policy affected Soviet and Chinese material support of Hanoi.[163] What Hanoi failed to grasp was that the audacity of the attack "provided Nixon with the public support necessary to retaliate."[164]

US forces were not completely caught off guard, even though scheduled reductions in US troops from 200,000 to 69,000 in May and aircraft from 500 to 375 left them reeling from the initial attack. In the spring of 1971, the CIA had warned of a potential election-year attack; but they believed the enemy could not "launch a nationwide military offensive on anything approaching the scale of Tet 1968."[165] Even so, 200 NVA tanks were deployed undetected to various staging areas in 1971–72, and as one analysts later noted, "This

stealthy deployment, together with the persistent perception that the enemy's logistical system was less efficient than it was, deflected American intelligence analysts from a correct understanding of Communist plans."[166]

The initial attack was launched by 50,000 troops from Laos against Quang Tri province in MR I. On day two, 160 miles south of the DMZ in the Central Highlands in MR II, 28,000 more NVA attacked the Kontum province. The enemy opened a third front with 31,000 men attacking 375 miles south of the DMZ and 60 miles west of Saigon. Of the 200,000 enemy troops eventually involved, 120,000 were NVA regulars, 50,000 VC main-force troops, and 30,000 irregulars. Supported by tanks and artillery and protected by low-lying clouds, NVA units in MR I pushed ARVN units out of Quang Tri City by 1 May. The new ARVN commander, Gen Ngo Quang Truong, retreated south and set up a tenuous defensive line on the south bank of the My Chanh River. By 14 May, NVA units in MR II had overrun Dak To and placed Kontum City under siege, while in MR III the NVA had destroyed an entire ARVN division, taken Loc Ninh, and surrounded An Loc by 13 April.[167]

At An Loc, the 9th VC Division fought the 15th and 21st ARVN. On 11 May, with the eastern part of the city under attack, one enemy prisoner of war recalled that B-52s struck about 0500 hours. They pounded the eastern approaches to the city every hour on the hour for 25 hours, bombing several targets more than once. Entire units were wiped out. Five days later, a PAVN column supported by 20 tanks attacked an ARVN force just south of Kontum City on route 14. Three cells of B-52s attacked each enemy column and obliterated them. On the 26th, the enemy made one last assault on Kontum City, which failed because of a tenacious ARVN defense and B-52 support.[168]

In December 1971, Nixon—concerned by intelligence reports—had responded with Operation Proud Deep Alpha, during which USAF fighters flew more than 1,000 sorties against enemy staging areas just south of the 20th parallel. Additional attacks took place in February 1972 but were limited during the president's trip to China. Simultaneously, the number of US aircraft in SEA increased with the dispatch of 207 USAF F-4

Phantoms from 29 December 1971 to 13 May 1972, bringing the total in theater to 374.[169]

Nixon subsequently ordered 161 additional B-52s to Andersen AFB and U Tapao between 5 February and 23 May, creating a total force of 210 BUFFs in East Asia—which was more than one-half of SAC's entire strategic-bomber force. This redeployment began under Operation Bullet Shot in February when 30 BUFFs were sent to Andersen. All totaled between 1 April and 31 July 1972, the number of USAF strike aircraft increased from 375 to 900.[170] By mid-April, Marine officials had deployed 40 F-4s to Da Nang and two squadrons of A-1s to Bien Hoa. Concurrently, Nixon sent the USS *Kitty Hawk* and *Constellation* to join the *Coral Sea* and *Hancock* in the Gulf of Tonkin. By late April, the *Midway* had also arrived, followed on 27 June by the *Oriskany*, and 3 July by the *America*, which replaced the *Constellation*. By mid-July, three and one-half months after the offensive began, the United States had six carriers on station—each with 60 strike aircraft, a total of over 350 naval aircraft. US strike aircraft in-theater now totaled 1,380, up from the 495 present in March.[171]

As Nixon himself assessed, he was now ready "to go for broke and bring the enemy to his knees." He was determined to resume bombing NVN and mining Haiphong harbor. Having negotiated closer ties with both Moscow and Peking, he now believed he could afford to be bolder with Hanoi. Gen John W. Vogt Jr., on his way to assume command of the Seventh Air Force, met with the president and later described him as wild-eyed.[172]

On 2 April, Nixon authorized air strikes against AAA and SAM sites, and logistics targets 25 NM north of the DMZ. Poor weather hampered operations until 5 April, when—as part of Operation Freedom Train—US fighters attacked supply and logistics targets south of the 18th parallel, 60 miles north of the DMZ. The results were disappointing. The major flow of enemy supplies and troops remained unimpeded, so the president expanded the area of operations to parallel 20' 25° or 231 miles north. On 16 April, using B-52s for the first time, Nixon sent 18 BUFFs from the 307th Strategic Wing stationed at U Tapao to attack oil storage facilities near Haiphong. Four more April B-52 raids followed with impressive results.[173]

As Nixon prepared to send his foreign policy adviser back to Paris for a negotiating session with NVN's lead negotiator, Le Duc Tho, on 2 May, he considered a three-day series of B-52 raids against Hanoi, to commence on 5 May. But Kissinger, fearing domestic reaction, and General Abrams, commander MACV, declaring his need for the B-52s in the south to curb the enemy offensive, convinced the president otherwise. Instead, Nixon opted for a plan from Kissinger's military assistant Maj Gen Alexander Haig that called for sustained bombing by tactical bombers and mining of Haiphong and other North Vietnamese harbors. Similar in design to Operation Rolling Thunder, its main force was to be tactical aircraft from the carriers of Task Force 77 and from the Seventh Air Force. Only a handful of B-52s were to be used, mostly in the south. The operation, called Linebacker, began on 10 May and officially ended on 15 October 1972.[174]

Linebacker I

Planners conceived Linebacker in four phases. The first involved an attack against railroad bridges and rolling stock in and around Hanoi and then northeast toward the PRC. The second phase targeted primary storage areas and marshaling yards near the northern capital. Phase three was aimed at storage and transshipment points created to cope with phases one and two. Attack planners envisioned these targets being hit at the discretion of local commanders, as often as necessary to impede the shipment of supplies south. Phase four targeted associated enemy defenses, such as ground control intercept radar sites, command and control, MiG airfields, SAM and AAA sites, and their logistics depots and support facilities.[175]

Part two of the overall operations, code-named Operation Pocket Money, involved aerial mining of northern ports. On 9 May at 0800 hours Saigon time (Monday, 8 May, 2000 hours Eastern Standard Time), the president announced on national television that US planes would begin mining ports and harbors at 0900 hours and that the mines would be activated on 11 May at 1800 hours. Initially, the mining achieved its goal; "from the day the mines came alive through September, no vessels are known to have entered or to have left NVN's ports."

At first, the enemy stopped ships 12 miles from port and unloaded 6,000 tons per month from these freighters. However, highly effective US fighter attacks kept the unloading to night, thus restricting the flow of materials.[176]

The risks of Linebacker were great. Nixon was scheduled to meet with Soviet leaders at the end of May, and there was fear among advisers that the public would react negatively. But the president's instincts were that the public would accept a Soviet failure because of the fall of Saigon. In the end, the summit was a success and South Vietnam was saved; but ultimately this success was not a result solely of the air campaign in the North.[177]

During Operation Freedom Train—April to June—US forces flew 27,745 attack and support sorties, 1,000 of which were flown with B-52s. The United States lost 52 planes—17 to SAMs, 11 to AAA, three to small arms, 14 to MiGs, and seven to unknown causes. The enemy fired 777 SAMs in April, 429 in May, and 366 in June. At first, they used ripple firing tactics—one high, one low, and one in the middle—for total coverage. Early enemy successes were later offset by US countermeasures, including the use of chaff and especially by the B-52s. The United States also utilized Iron Hand anti-SAM tactics employing F-105 Wild Weasels, which used the enemy's SAM radar rebound signals to direct laser-guided bombs to the target. The United States also used hunter/killer formations; Wild Weasels spotted sites, and F-4s dropped high-explosives and cluster bombs on them.[178]

The enemy was well armed with 4,000 23 mm to 100 mm AAA weapons, half around Hanoi and Haiphong. Air Force analysts determined that these defenses were less dangerous than those faced during Rolling Thunder because Air Force laser-guided bombs "were dropped at a much higher, and therefore safer, altitude than unguided munitions."[179] Hanoi also had more than 200 MiG fighter aircraft including 70 MiG-21s. The rest were MiG-17s and MiG-19s. The enemy used fewer sorties and aircraft than they did during Rolling Thunder—mostly in the vicinities of Hanoi and Haiphong. Only one US aircraft was lost to MiGs in the North during Freedom Train, while US pilots downed nine fighters.[180]

F-105 Thunderchiefs over Thailand

Thuds—such as these flying over Thailand—were used to bomb enemy bridges in the North and troop concentrations in the South during Rolling Thunder 1965–68. One specialized version was developed for defense suppression.

As the campaign unfolded, the enemy revised its tactics using ground-control radar to direct MiG-21s onto the tail of a US formation heavy with fuel and munitions. They fired air-to-air missiles as vulnerable US planes maneuvered on their bomb runs at lower speeds. MiG-21s also attacked from the rear to force formations to take evasive maneuvers while a second wave of MiG-19s attacked from the front. By July, enemy fighters had downed 26 US aircraft while losing 32 of their own in the process. The United States reacted by using the Teaball weapons control center in Thailand to coordinate data from airborne radars over Laos and the Gulf of Tonkin to warn US aircraft of enemy aircraft locations. As a result, from 1 August to 15 October, MiG losses totaled 19, while US losses dropped to five.[181]

In early June, PACAF's report on the air operations declared that "the enemy has 'shown no signs of response to the inter-

diction . . . ; therefore it is estimated that only a small amount of material is entering NVN via the highway system.'"[182] As TACAIR struck the North, most B-52s continued to support ground operations in the South. Seventh Air Force, still responsible for support of defenders facing Route Package (RP) 1 in southern NVN and the DMZ—concentrated B-52 raids against enemy storage areas, supply transportation choke points, and enemy staging areas. As the offensive slowed, it revised its role to attacks on bridges, ferries, and fords in MR I (northern South Vietnam), moving up to RP 1 in phase two. In phase three they created choke points around Dong Hai in RP 1 by destroying bridges on Highways 101 and 1A. On average B-52s flew 30 sorties per day, mostly against the bridges in RP 1.[183]

Officials also revised campaign priorities, placing at the top, attacks against northern rail lines out of China; rail and road links between China and Hanoi and Haiphong moving south to the DMZ; oil and gas areas, power stations, and rolling stock and storage areas other than fuel storage. By late June, North Vietnamese industry, mine-clearing forces, and inland waterways were added to the priority list. In spite of this emphasis on the North, 86.6 percent of the missions were flown against road, rail, and storage targets in MR I and RP 1 to interdict the flow of supplies from NVN to its troops in the South. General Momyer later noted that Seventh Air Force operated this way since there were too few planes to cover ARVN defenses in the South and attack all targets in NVN. Once the ground fighting ended in late September, attacks moved north of RP 1.[184]

As Linebacker began, air leaders were pleased by promises to lift restrictions that had hampered Rolling Thunder. But while political restrictions—such as legitimate fears of Soviet or Chinese intervention—had been reduced by the cooling of east-west tensions, the United States still had no desire to incite either into a rash act. Nixon understood that Vietnam, while important, was only part of a much larger "chess match"; and that détente benefited US interests more than anything short of what by now seemed to be an unlikely victory in Vietnam. Thus, while Linebacker I generally had fewer restrictions than Rolling Thunder, it was still subject to strict

guidelines. Linebacker restrictions included a no-bombing-buffer area on the Sino–Vietnamese border, as well as on northern dams, dikes, civilian watercraft, civilian population centers, and non-Vietnamese seaborne shipping. All attacks had to be initially approved by the JCS. Restrictions were especially tight from 21 May to 5 June during President Nixon's trip to Moscow. Four strategically critical bridges and tunnels near the Chinese border received only minimal attention.[185]

The most effective attacks against bridges and railroads employed MK-84 laser-guided bombs, which comprised over 90 percent of the laser bombs used in SEA. They were 2,000 lb general-purpose bombs with a laser-seeking head, small computer, spiral tail assembly, and canard control surface. One other less effective electro-guided bomb was the Walleye launch and leave glide bomb, guided by a computer and television camera. Too often deceived by camouflage, clouds, or smoke, it was used only in daylight. Its very low 6,000-foot release point also proved to be a major drawback.[186]

In May and June, F-4s—using MK-84s—destroyed the main bridges on the Sino–Vietnamese border, including the Thanh Hoa bridge over the Song Me River. The primary rail and road lines in the northwest remained interdicted through the end of June, while the northeastern passages were less effectively blocked. Nothing seemed to be very effective against less sophisticated targets, such as inland water traffic. One JCS report determined that it "was the most difficult system to attack." Even mining inland streams and rivers with MK-36 mines had little effect. Only armed reconnaissance or naval gunfire had effect. This was because these routes had no real choke points, and loading and unloading small vessels required only "a firm bank and a few planks."[187]

While mining northern harbors seemed to deter enemy shipping, the pipelines out of China were so widely dispersed that PACAF analysts concluded they were virtually immune to serious disruption; since they were too hard to find, too hard to hit, and too easy to repair. Linebacker also failed to effectively cut highways, which also proved to be very difficult targets to destroy. These well-defended targets required large fully escorted formations, which drained US resources. Night attacks

were limited because of technology lags, and there was never enough armed reconnaissance. On 28 June, PACAF admitted that the "tonnage involved in shipments from China to NVN could easily equate to the amounts received via North Vietnamese ports prior to US mining operations."[188] The CIA estimated that 85 percent of "North Vietnam's needs could be supplied overland in the event of a blockade."[189]

The failure of Commando Hunt to interdict NVA supplies allowed them to preposition caches of supplies in South Vietnam; thus they had an adequate amount of supplies during the spring and early summer of 1972. As a result the most important air operations were carried out in the South in support of ARVN defenders, and many of the battles between ARVN and NVA troops were so intense that B-52s bombed within 1,000 meters of the defenders. In April and May, B-52s flew 1,682 sorties in MR II with 727 sorties flown in support of the An Loc siege defenders. In South Vietnam enemy air defense threats were less than in NVN, even though one hand-held SAM-7 did shoot down the first AC-130 gunship lost in the South. The reduced threat environment allowed the allies to use fixed-wing gunships, helicopter gunships, and other prop aircraft, including those of the South Vietnamese Air Force (SVNAF), which flew nearly 3,000 CAS sorties between April and October. Flying lower and slower at 500 feet, these aircraft proved very effective.[190]

Concurrently, F-4s destroyed 45 bridges along the DMZ and 11 of 23 PT-76 Soviet-built light tanks trying to outflank ARVN units at the My Chanh defense line near the South Vietnamese coastline. B-52s returned to RP 1 in July, flying 1,308 sorties by September destroying 109 supply depots, truck parks, and fuel storage sites. During Linebacker operations, US aircraft of all types flew over 6,000 sorties in RP 1, making it the most heavily bombed region during the spring and summer of 1972.

The NVA offensive slowed in May and was nearly over by June. The last attack against the My Chanh line—on 25 May—was blunted by ARVN units supported by SVNAF and US air components. On 8 June ARVN units began a counteroffensive that eventually retook Quang Tri City on 16 September. Among the key elements in the NVA failure was their inability

to fully use their tanks because of constant allied CAS operations. The enemy suffered heavy casualties in taking Quang Tri City, and this delayed their original timetable and prevented them from moving on Hue. B-52 raids against advancing enemy units and their supply lines in the South also played a key role in creating so many casualties. The BUFFs' constant attack on enemy logistics and communication lines delayed their advance at least two or three weeks expending far more of the prepositioned supplies than the NVA had planned.[191]

Linebacker I and collateral air operations (5 April to 23 October 1972) dropped 155,548 tons of bombs on NVN or about 25 percent of what Rolling Thunder had expended. General Vogt declared, "More damage was done to the North Vietnamese lines of communications during Linebacker than during all our previous efforts." He claimed that US aircraft destroyed almost all fixed oil storage facilities and 70 percent of the electric power generating capacity in NVN, meaning that nearly all of Hanoi's portable generated power had to go to military use. In addition, the psychological effect was great since 20–40 percent of Hanoi residents had to be evacuated.[192] Gen Bruce Palmer concluded that "The North Vietnamese appear to have had in South Vietnam and adjacent areas of Laos supplies sufficient to see them through their defeats, which were the accomplishments of the South Vietnamese infantry, tactical close air support, and the B-52s."[193]

In spite of their losses, the NVA made important gains: they held much of the countryside in South Vietnam and were still determining the tempo of the war. The NVA had not been defeated, only delayed. They slowed the offensive to preserve their remaining southern forces, which they planned to rebuild during a new series of negotiations with the Americans. Without doubt, US airpower played a decisive role in preventing a southern defeat in 1972. The offensive moved ahead with its prepositioned supplies until June, when the lack of resupply caused by US air raids forced the offensive to bog down. However, during the ARVN offensive to retake Quang Tri City, six NVA divisions (albeit under strength) were well supplied, especially with artillery shells, often an excellent indicator of

logistics strength. The communist defenders expended 3,000 rounds per day against the three attacking ARVN divisions. As one analyst put it, "it is not likely the NVA in MR I were ever effectively interdicted."[194]

America's prodigious Linebacker effort meant that Laotian interdiction ceased almost completely, since allied air forces—even after the spring buildup—were not sufficient to continue simultaneous operations against the trail and NVN. The CIA and Defense Intelligence Agency (DIA) reported that the enemy still had 14,000 trucks available during the offensive and that from 55,000 to 75,000 tons of supplies per month entered NVN from China, effectively countering mining efforts. Thus their extensive use of inland waterways, the pipeline, and vast numbers of trucks—heavily defended by air defenses and hidden at night—meant that the enemy could, and did, weather Linebacker, to wait for a better day.

US air forces could not afford even modest attrition rates, which meant that the Seventh Air Force was reluctant to conduct armed reconnaissance missions in the northern route packages not only because the enemy AAA and SAMs were highly effective but because to do so meant risking or diverting precious resources and weapon systems. The United States tried to compensate by using precision-guided munitions, which proved effective against bridges, structural features, and industrial targets. But the North was not totally dependent on such things.[195]

Linebacker II

In July Kissinger, encouraged by requests from the North Vietnamese for renewed talks, convinced the president to reopen negotiations in Paris. Hanoi accepted, but by now, Nixon—flush with the success of his Moscow trip and leading by a wide margin in the polls for the November elections—no longer believed he needed peace in Vietnam to win reelection. President Nixon believed he could gain better terms after the election when he would have a free hand to use more airpower. Kissinger did not agree fearing that the broad use of airpower, especially B-52s, "would cause a domestic outcry and that in any case such attacks were unnecessary." Even so, Nixon

authorized B-52 and fighter-bomber attacks against storage and communications targets along the DMZ, which averaged 30 sorties a day over the North through October.[196]

In the meantime, Kissinger held talks with an apparently more conciliatory Tho from 19 July to 14 August. But Tho would not relinquish his demand for a coalition government in the South. On 8 August, Nixon—convinced that the communists would not settle anything before the November elections—cabled Admiral McCain, telling him to "notify his subordinate commanders that Linebacker would begin to hit the North harder." US military planners subsequently made plans for 48 sorties per day over RP 5 and RP 6, with the Navy focusing on 6B and the USAF on 5 and 6A. Periodic B-52 strikes over the North continued, but most missions were executed by TACAIR, using precision ordnance. One spectacular success for precision bombs came when a single flight of F-4s dropped laser-guided bombs on the Son Tay warehouse and storage area. Three buildings—300' x 260', 260' x 145', and 210' x 65', respectively—received direct hits that completely destroyed them.[197]

On 25 September 48 new all-weather F-111 swing-wing figher (nicknamed Aardvark)—capable of flying at night, at low altitude, and at supersonic speeds—arrived in Thailand. By 13 October the F-111s made one-half of all northern air strikes, averaging 24 sorties per night. Often scheduled at random and without warning, they were an awesome new weapon that had a growing impact on enemy planning.[198]

On 15 September, US air forces upped the ante and Kissinger once again commenced negotiations in Paris. On 8 October, Tho made a major concession when he dropped the requirement for a coalition government. Instead, he seemed to accept Nixon's April 1972 call for an in-place cease-fire, followed by the withdrawal of the last US combat troops. In retrospect, he could make such an apparent concession because 150,000–200,000 NVA troops would be left in South Vietnam by such a peace settlement. As a result of this breakthrough, the president curtailed but did not halt US bombing.[199] As Dr. Tilford notes in *Crosswinds,* "By early May it was clear that the invasion had not toppled the Saigon government. Fourteen new divisions of North Vietnamese troops had joined about

100,000 PAVN troops already in South Vietnam; they not only posed a considerable military threat but also constituted a grim political reality for the Saigon regime."[200]

In late 1972 one of the greatest impediments to ending US involvement was the 200,000 NVA troops that Hanoi argued had entered the South before 31 March. While Hanoi agreed to withdraw nearly 100,000 troops it claimed had entered the South after 31 March, they demanded the other 100,000 PAVN troops stay. Saigon demanded they leave. In the end, in order to end the war Nixon opted to ignore this issue, and the final peace document allowed 100,000 PAVN forces to stay.

On 19 October Thieu read the new draft agreement for the first time and was indignant concerning the tenets, which allowed NVA troops to remain in the South and called for the creation of a National Council of Reconciliation and Concord with communist representatives. Realizing that this last provision was a coalition government in disguise, Thieu defiantly made 69 revisions he deemed absolutely necessary for his support. Nixon, reluctant to act without Thieu's support, did not sign the draft agreement. But he suspended air attacks above the 20th parallel as an act of goodwill. While frustrated by Thieu's hesitation, Nixon sympathized and assured him that no agreement would be signed without his prior knowledge and approval.[201]

Northern leaders were outraged, and on the 26th, in an effort to force Nixon's hand, Radio Hanoi publicly revealed the heretofore secret records of the negotiations. They condemned the United States for going back on their word and demanded that US negotiators sign the draft agreement immediately. Soon after, Kissinger held his first national television news conference declaring that peace was at hand, a declaration most Americans believed. While Nixon's lead in the polls reached 25 percent, Kissinger's own popularity seemed to eclipse the president's. Many in the White House believed Kissinger was trying to take full credit for the peace—a perception Nixon could not tolerate. According to Kissinger, Nixon began to "look for ways of showing that he was in charge."[202]

In November Nixon won a decisive victory over Sen. George McGovern (D-S.D.), but the Republicans fell short of a majority

in the Congress. The president now had to rethink his peace timetable. With negotiations scheduled to resume on 20 November, Nixon had to end the war before the Democrats in Congress did. He did not want to end US commitments to Saigon and even was willing to risk the loss of public support to guarantee continued material aid for South Vietnam once US combat troops were gone. President Nixon also wanted to be sure that he, and not Kissinger, gained history's credit for the peace.

Nixon pressured Thieu to accept the best deal possible as soon as possible. To this end, he was determined that Hanoi accept at least a few of Thieu's revisions. Concurrently General Haig was dispatched to Saigon to reassure Thieu that the United States would retaliate swiftly if the North broke the treaty. Nixon was resolved to conclude a "separate agreement if Thieu delayed much past 8 December" and now decided to use his trump card, airpower.[203]

Northern foot–dragging characterized the November negotiations; so by the end of the month, Nixon ordered plans for B-52 campaigns against the North. As US military planners prepared for a three- or six-day strategic bombing campaign, Tho continued to run hot and cold. On 7 December he seemed ready to give in on all points, then on the 13th he delayed proceedings while staff personnel made 17 changes in the final draft. At this point the president was determined to increase in intensity the heat of battle. Some White House staffers like Haig wanted a repeat of Linebacker I, but Nixon decided to aim this air campaign at enemy morale.[204]

President Nixon chose to use the B-52 because it was a powerful weapon that would send a message of US resolve to end the war to both North and South Vietnam. The psychological impact seemed to Nixon to be as important as the actual destructive power. The big bombers flew above 30,000 feet and when they attacked, those on the ground seldom saw or heard them before they dropped their bomb load. After the war, VC Minister of Justice Truong Nhu Tang described a B-52 raid as follows: "It seemed, as I strained to press myself into the bunker floor, that I had been caught in the Apocalypse. The terror was complete. One lost control of bodily functions as the mind screamed incomprehensible orders to get out."[205]

Nixon wanted northern civilians to feel the sheer terror US airpower could elicit. The full use of the B-52s stunned the JCS. Nixon told JCS chairman Adm Thomas H. Moorer, "This is your chance to use military power effectively to win this war and if you don't I'll consider you personally responsible." Plans called for a three-day, around-the-clock, all-weather campaign against Hanoi. SAC planners—who had originally designed a Linebacker I-style campaign—rewrote the operations plan to focus on the B-52s. The final draft was approved in early December and sent to General Meyer, SAC commander. Admiral Moorer, on orders from Nixon warned General Meyer, "I want the people of Hanoi to hear the bombs . . . but minimize damage to the civilian populace."[206]

It was one thing to decide to use B-52s, it was quite another matter to plan and carry out the missions. As Dr. Futrell notes in volume two of his book on Air Force basic thinking, "Although B-52 strategic bombers had long been committed to single-integrated operational plan (SIOP), general war strikes against route and terminal air defenses in the Soviet Union, the problem confronting them in the Linebacker II strikes . . . was immensely more complex."[207] Like horseshoes, nuclear bombs do not have to be as precise as iron bombs in order to score. As Futrell concludes, "In the case of the Soviet Union, the number of potential targets was very large, and the air defenses had to be spread over a vast area. Moreover, Air Force bombers were to be penetrating at low altitudes and using short-range air missiles (SRAM) to suppress SAM defenses. They were to be using nuclear weapons, so that only a single bomber would need to penetrate to destroy the target and probably much of its defenses."[208]

In August General Meyer, anticipating further B-52 actions, had ordered Eighth Air Force planners to prepare an operations plan. In November Lt Gen Gerald W. Johnson, Eighth Air Force commander, sent the draft plan to Headquarters SAC for final approval. It approved extensive attacks against Hanoi and Haiphong using multiple-bomber formations simultaneously attacking from different directions. Meyer was particularly concerned that collateral bomb damage might cause large numbers of civilian casualties. President Nixon believed

Lt Gen Gerald W. Johnson

Commander of the Eighth Air Force during Linebacker II

such casualties might be a major propaganda setback, even in the United States. For this reason Meyer did not use the Eighth Air Force plan. Instead, he detailed his staff to create a new plan.[209]

With few traditional strategic bombing targets around Hanoi or Haiphong, the B-52s needed to attack several times in concentrated groups to assure target destruction. With only three days, planners formulated an inflexible scenario that sent all three waves of bombers on the same route at the same altitude and at the same times for the first three days. To avoid civilian casualties, the scheme determined that crews would be required to adhere to the "planned course and fly in a trail formation with cells of three aircraft." Moreover, the pilots were supposed to stabilize the flight four minutes prior to bomb release to avoid midair collisions.[210] Staffers at Eighth Air Force were alarmed by the repetitive routing, and some feared casualty rates as high as 16 to 18 percent. General Meyer, using the SIOP used for planned attacks on the USSR, estimated losses at 3 percent.[211]

The plan aimed the attack at "rail yards, storage areas, power plants, communications centers, and airfields located on Hanoi's periphery." In support, Seventh Air Force and Navy fighters, using "smart bombs," were to strike targets in populated areas to avoid civilian casualties. The B-52s would hit targets within 10 miles of Hanoi. They would also make night raids to force the populace to seek shelter during sleeping hours, increasing the psychological discomfort and reducing the threat of MiG attacks.[212]

Linebacker II would be different from any previous US air attack. One subsequent report noted "where Linebacker I had been an interdiction campaign directed against supply routes throughout NVN, Linebacker II was a sustained maximum effort using airpower to destroy all major target complexes located in the Hanoi and Haiphong areas."[213] Planners conceived the operation as two distinct operations. The first had B-52s flying at night attacking the enemy's war-making infrastructure and industry supported by F-111s and Air Force and Navy tactical air assets. The second operation was a day package employing Air Force A-7s and F-4s as well as Navy

and Marine A-6 Intruders, A-7s, and F-4s. The campaign, somewhat unintentionally, played out in three phases. The first lasted from 18 to 20 December and featured 314 nighttime B-52 sorties against rail and supply assets around Hanoi. The second lasted from 21 to 24 December and focused 120 B-52 sorties against targets near Haiphong. The third phase followed the Christmas bombing pause and lasted from 26 to 29 December. These attacks marked an increased effort during which 295 B-52 sorties attacked 13 targets and five SAM sites around Hanoi.[214]

On 18 December, 129 B-52D and G crews from U Tapao and Andersen launched their first attack. At 1945 hours the first wave of 48 aircraft struck the Kinh No storage complex, the Yen Vien rail yard, and three airfields on Hanoi's outskirts. Supported by 39 other US aircraft, the bombers flew in formation on a route west to east near the Sino–Vietnamese border, turning southeast to make their bomb run. Attacking in a trail formation of three-ship cells, later known as "an elephant walk," they dropped their bombs with 10 minutes of separation between the cells. Pilots stabilized the flights four minutes before the bomb release to assure accuracy and destruction. After dropping their load, they turned west to avoid SAM attacks. The second wave struck at midnight and the third at 0500 hours. The results were good. They had hit 94 percent of all targets, only losing three BUFFs to SAMs and having two severely damaged.[215]

The president was exuberant and extended the operation indefinitely. Even before the bombing began, President Nixon had also made overtures to Hanoi for meetings anytime after the 26th based on the November draft augmented with a few negotiated changes. Nixon also hoped that his stick and carrot policy would force the North back to negotiations and demonstrate US resolve to Saigon.[216]

On the 19th, 93 B-52s struck Thai Nguyen thermal power plant and Yen Vien rail yard, using the same tactics. Two more of the big bombers were damaged but none shot down. Now confident that the North had not made a fix on the routing scenario and realizing a change would require a long lead time, officials sent out a third strike on the 20th. The 99 B-52s attacked in the

Crew Members in Linebacker II

B-52 crew members during a briefing early in Linebacker II

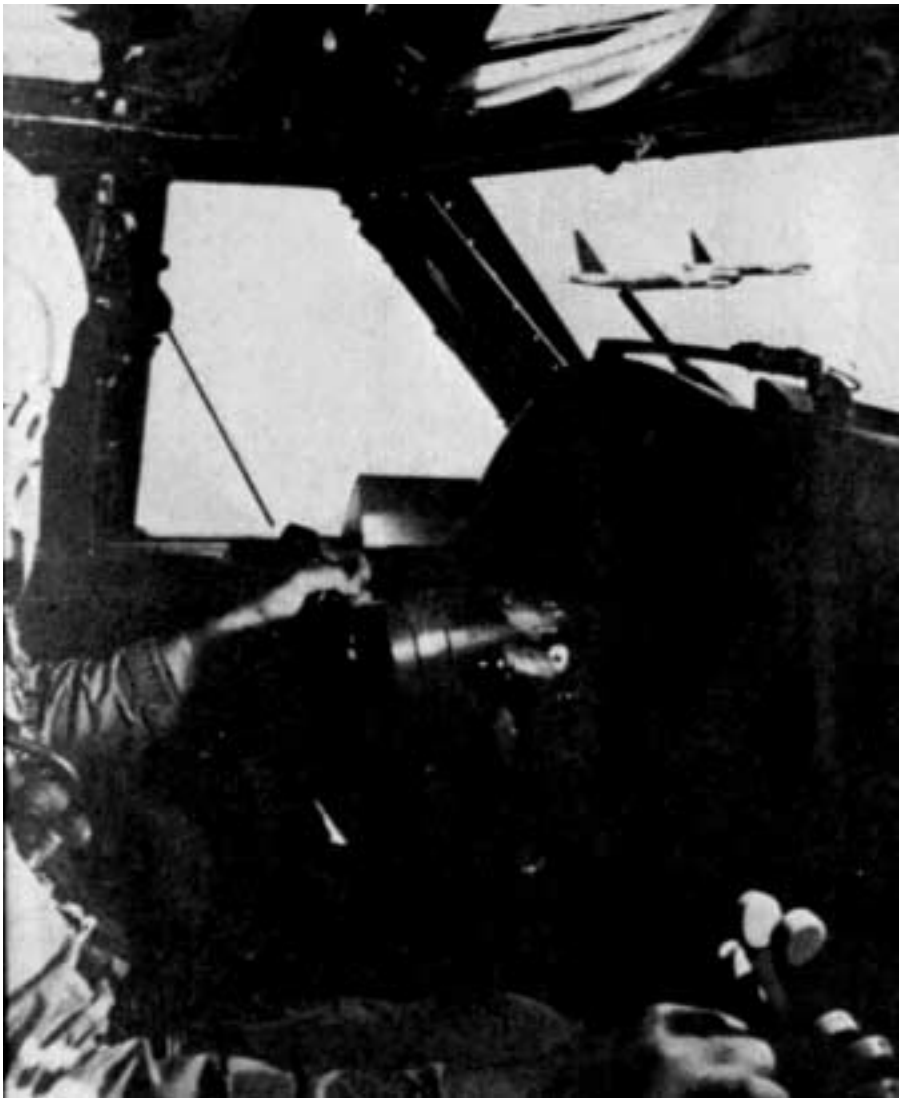
familiar three-wave pattern. The targets were basically the same but this time the enemy SAMs downed six BUFFs and severely damaged another.[217]

Nixon, livid, railed at senior officials that such losses would cause Linebacker II to have the opposite effect of that which he desired. He "raised holy h--- about the fact that [B-52s] kept going over the same targets at the same times." While Nixon later asserted that he had convinced the military to alter the bombing plans; Air Force personnel—especially General Meyer—recognized how unacceptable the losses were because the B-52s were also the centerpiece of the US nuclear strike force. Two more bombers went down on the 21st, while most Seventh Air Force raids of the 21st were canceled by bad weather. On the 22d, Meyer directed planners to change tactics and create plans for a new kind of raid for the 26th.[218] Based on Meyer's initiative, CINCPACAF sent a message to Seventh Air Force headquarters stating that "Events of the past four days produced significant B-52 losses which obvi-

ously are not acceptable on a continuing basis." Among other things CINCPACAF recommended that local planners: "Vary B-52 flight altitudes with the chaff corridor on ingress. Change release altitudes and the ingress/egress headings on a daily basis."[219]

It is also worth noting that the enemy fired large numbers of SAMs to gain its kills, expending a total of 1,240 to 1,250 during Linebacker II. One MACV report declared, "The most serious threat to US aircraft during Linebacker II was the SAM reaction. The total number of SAMs fired during the 12-day offensive was greater than during any previous month in the SEA conflict. Specifically, a total of 1,321 SAMs were launched at US planes over NVN, 1,250 of which were directed against Linebacker II forces. B-52s attracted 1,032 SAMs, to give the SAM operators a kill ratio of 68.8 to one (SAMs fired per B-52s downed)."[220] The enemy "resorted to salvoing large numbers of missiles in a shotgun pattern into the calculated path of the on-coming aircraft." Although wasteful, it was temporarily effective, "because all portions of Linebacker II got under way more or less concurrently, [and] the Air Force had no opportunity to send tactical aircraft to wipe out . . . the numerous SA-2 missile sites that encircled both cities [Hanoi and Haiphong]."[221] At the same time, MiG interceptors were never much of a problem, since Linebacker II missions were flown in darkness and the only enemy fighters to challenge B-52 formations generally flew aimlessly through the bomber formations, causing little damage. B-52 tail gunners shot down two MiG interceptors.[222]

As assistant deputy chief of staff, operations, MACV, General Cross, declared in an interview at the time: "For every action that we took there was a reaction by the North Vietnamese. They never waited to make some corrective action when they felt like they had failed the course. . . . If they were provided even more modern equipment they could certainly be able to make us stop and think about the worth of our continued bombing of the North, because the SA-3 and SA-4 missiles would present new and more complex problems to us and make our survivability more difficult in an unfriendly environment."[223]



B-52Ds

A flight of B-52Ds in a three-cell formation is seen from the cockpit of one of the BUFFs.

While day three proved disastrous because the number of B-52s that went down, it also proved to be the turning point of the campaign. Upon examining aerial photos of the raid, of-

ficials discovered that none of the SAM sites had spares. As a result, General Meyer decided to target SAM sites and SAM supply dumps to clear the skies over NVN of threats to the B-52s.[224] Meyer turned over planning responsibility to General Johnson in Guam and reduced the B-52 sortie rate to 30 per day until a new plan could be fully implemented. He also made U Tapao the sole Linebacker II base of origin. It could handle the sortie rate without B-52s from Andersen, and its B-52s did not require aerial refueling. The new primary targets became SAM sites and SAM munitions storage facilities. SAM gunners had few spares, which reduced the lethality of the enemy defenses. The immediate tactical change would avoid Hanoi and concentrate on Haiphong.[225]

From 22 to 24 December, B-52s—escorted by Navy planes flew raids against rail yards and storage facilities—feinting attacks against Hanoi and then turning on Haiphong. Each route and altitude was different; thus results were excellent and only one aircraft was damaged. On the 22d, Nixon offered a new peace plan, calling for renewed meetings on 3 January 1973. As a show of goodwill, President Nixon initiated a 36-hour Christmas bombing pause and guaranteed that he would halt bombing above the 20th parallel if the North would agree to renew negotiations. Hanoi remained silent, and while many around Nixon urged a continuation of the pause after Christmas, he determined that only renewed pressure would gain the desired effect.[226]

On 26 December, 120 B-52s struck 10 different targets in 15 minutes. Four waves of 72 bombers hit four targets in Hanoi from four different directions; at the same time, two other waves of 15 bombers each struck Haiphong from the east and west, and 18 B-52s raided Thai Nguyen rail yards north of Hanoi. Even though the enemy fired dozens of SAMs, only two BUFFs were lost. In the largest effort of the campaign the United States staggered the enemy, shortly thereafter Hanoi notified Washington that it would accept Nixon's offer to return to negotiations.

On the 28th, Hanoi also agreed to Nixon's demands that preliminary meetings between Tho and Kissinger begin on 2 January and that the North agree not to discuss matters already

resolved in the basic agreement. In turn, Nixon promised to end bombing above the 20th parallel once these demands were met. But he warned that negotiations had a time limit and the clock was ticking.[227]

On the 27th, 60 B-52s attacked the Hanoi and Lang Dang rail yards near the Chinese border. A small-scale version of the previous day's attack, the bombers again struck from various directions, hitting many targets simultaneously. Again the enemy fired numerous SAMs, downing two more BUFFs, thus bringing the total losses to 15.

On the 28th, 60 more bombers struck SAM sites around Hanoi. As noted, that same day Hanoi agreed to begin preliminary talks on 2 January; and at 1900 hours the next day, the president ended Linebacker II after a final raid. As it turned out, there were no enemy air defenses on the 29th; and as one participant, Capt John R. Allen, affirmed in a subsequent interview with Lt Col Mark Clodfelter, "By the tenth day there were no missiles, there were no MiGs, there was no AAA—there was no threat. It was easy pickings."[228]

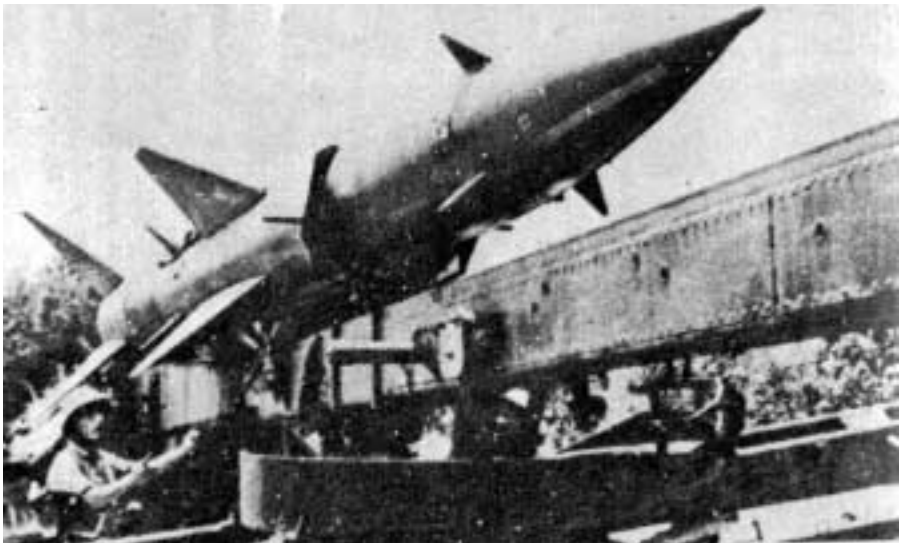
During the 11 days of Linebacker II, B-52s flew 729 sorties (741 had been planned) against 34 targets north of the 20th parallel and dropped 15,237 tons of bombs. Air Force and Navy fighters flew 1,216 sorties and dropped 5,000 tons of bombs. They destroyed 383 rolling stocks, made 500 rail cuts, leaving rail traffic in total disarray, demolished 191 warehouses around Hanoi and Haiphong, reduced electric power generation from 115,000 kilowatts to 29,000, and reduced petroleum, oil, and lubricants capacity by three-fourths. Perhaps of equal importance, NVA troops in the South were very low on food and supplies. US sources determined that civilian casualties had been relatively low, though enemy sources claimed 1,318 killed; 1,216 more wounded; and 305 killed in Hanoi. As had been the US goal, enemy morale in Hanoi was hurt, while little damage was done to the city. A total of 15 B-52s were lost and nine damaged during Linebacker II—all because of the 24 SAM hits on the BUFFs. Of the 92 crew members, 26 were rescued, 33 bailed out and were captured, 25 were listed as missing, and eight were killed outright or died of wounds. US air forces also lost two Navy A-7s, two Navy A-6s, two Air Force F-111As,

three F-4s (two USAF and one Navy), one EB-66, one RA-5C, and one HH-53 search and rescue helicopter. All totaled, they lost 27 aircraft. Of these, 26 aircraft were lost during actual Linebacker sorties and the EB-66 while in support. SA-2 SAMs accounted for 17 kills, while three aircraft were lost to daytime MiG attacks, four to AAA, and three to unknown causes. Later, evidence suggested SAMs or AAA also downed these. Even so, the official PACAF report correctly declared "the threat picture was heavier than US losses indicates and the 2.1 percent B-52 attrition rate was far below that expected."[229]

On 27 January 1973, Secretary of State William P. Rogers signed a peace agreement with Hanoi, ending America's active participation in the war. Later, when asked what effect Linebacker had had on achieving the Paris Peace Accords, then presidential foreign policy advisor, and soon to be secretary of state, Dr. Kissinger, declared, "there was a deadlock . . . in the middle of December. . . . There was a rapid movement where negotiations resumed . . . on January 8. These facts have to be analyzed by each person for himself."[230]

Nixon had won the right to disengage the enemy. Nixon's war aims by December 1972 were limited, and the results were not the kind of military victory America had originally envisioned in the 1960s. Linebacker II and the heroic efforts of US aircrews had forced a reluctant group of northern leaders back to the negotiating table to finalize the peace accords. Even though it was a major reason for the peace, bombing was not the only reason. "Nixon's threat of another Linebacker if the North refused to settle helped persuade the Politburo to accept terms that included some of Thieu's provisions."[231]

Another reason behind the peace agreement was Hanoi's concern for their troops in the South. Nixon's offer of a settlement, leaving the NVA in control of major portions of the South, forced them to continue to fight a war of movement which left them susceptible to US air attacks until a final peace could be signed. As senior Gen Tran Van Tra put it years later, "Our cadres and men were fatigued, we had not had time to make up for our losses, all units were in disarray, there was a lack of manpower, and there were shortages of food and ammunition. . . . The troops were no longer capable of fighting."[232]



SA-2

SA-2 surface-to-air missile, Soviet-built, near Hanoi during Linebacker II

Of equal importance was Nixon's progress toward closer relations with the PRC and USSR. While both continued to support the North, they sacrificed support for NVN to achieve warmer relations with the United States. Not only had détente dismissed the very real menace of direct Chinese or Soviet intercession that had tormented Johnson but also it likely prevented the North from adequately resupplying its forces at critical junctures during the summer and fall of 1972. On 17 August 1972, the Communist Party newspaper and mouthpiece in Hanoi, *Nhan Dan*, grumbled that "Nixon's détente had saved South Vietnam from defeat. The failure of China and the Soviet Union to provide North Vietnam with adequate assistance, the newspaper stated, equated to 'throwing a life-buoy to a drowning pirate . . . in order to serve one's narrow national interests.'"[233]

Hanoi also knew that the Nixon's aims, unlike President Johnson's, were limited by both potential congressional constraints and US public opinion. Johnson had fought the war to guarantee an independent South Vietnam. Rolling Thunder restrained by Cold War geopolitical considerations was aimed

at this long-term and, as it turned out, difficult goal. On the other hand, Nixon's limited goal was to end US participation, while leaving the South intact—something he called peace with honor. Nixon was constrained by campaign promises of Vietnamization, and Hanoi staked final victory on the Easter gamble, believing that Nixon would not recommit US ground forces. Even though its effort to reunite Vietnam failed, Hanoi remained committed to the goal; and with bases in the South guaranteed by the basic agreement, it had no reason not to sign the Paris Peace Accords in January.[234]

Even if those who argue that Linebacker II provided the United States an opportunity to win the war are right about the military change in momentum, the most likely follow-up to continued full-scale bombing would have been the recommitment of US ground troops to clear out the remaining enemy forces and assure southern stability. At best that would have returned Vietnam to a stalemate like the one that existed in the 1960s, only this time not with the VC in the South but with NVA forces all over SEA. Nixon would not and could not return one-half million American boys to such an uncertain future. Like the British in 1783, the US public and polity were weary of the fight and no longer saw any real need to sacrifice its youth or its wealth. As important as it was, Vietnam was only one aspect of a much larger struggle. In that regard, the impact of superpower diplomacy was as important as America's military power.[235]

Air Force Doctrine after Vietnam

How did this experience affect Air Force doctrine after the war? One might expect that such a bitter and protracted experience would have a long-lasting impact on the Air Force's basic theories of airpower. In many ways it has. There has been no apparent self-examination similar to the Army's with the publication of such books as *On Strategy* by Harry G. Summers Jr. In some ways—immediately following the conflict—US airmen dealt with Vietnam by ignoring it in their official theory and doctrine. Many could not decide what Vietnam meant historically to the development of airpower.[236] But

it was also important to realize that with détente and changes in the geopolitical landscape, Air Force attention had to refocus on missions that were not against insurrections and brushfire insurgents. It soon became clear that while Vietnam was important, it was only one part of a greater contest and only one part of overall US defense and foreign policy.

The Air Force has changed dramatically subsequent to the Second Indochina War. Its force structure, emphasis, and funding priorities are different. Today's leaders were deeply affected by their experiences and privately vowed to change the policy and technological circumstances in the Air Force to provide greater opportunity for success in future wars. Fighter pilots replaced bomber pilots in nearly all key Air Force positions after 1973. The mission of airpower has changed accordingly with SAC being combined with TAC to create Air Combat Command (ACC) that—unlike air forces in Vietnam—is not an army support group but a single air combat arm headed by a single air commander as was the case in the Gulf War.

Circumstances surrounding US defense needs have caused airpower to look away from insurgency and focus on more traditional roles developed in the 1950s and roles created since Vietnam. Dr. Futrell's exceptionally balanced and thorough work on Air Force theory and doctrine published in 1984 found it difficult, and perhaps too painful, to examine the writings and theories of the mid- and late 1960s. He jumps from the basic doctrine manual of 1964 to the manual of 1979 with little, if any, mention of insurgency conflict or aerial counterinsurgency. For example, in chapter 4, titled "Insurgency and War in Southeast Asia," there is no mention of AFMAN 2-5 and barely a mention of special air warfare or special operations concepts from the 1971 AFMAN 1-1.[237]

In this regard, the 1975, 1979, and 1984 basic doctrine manuals continued the 1971 trend away from examination of "Wars of the Third Kind," only briefly mentioning such conflicts.[238] Even though the 1980s and 1990s saw important new works on such conflicts and their relationship to airpower written by Colonels Clodfelter and Drew and other officers, the 1992 and 1997 *Basic Aerospace Doctrine of the United States Air Force*—by now focused on new conventional and nuclear

issues—made essentially no reference to the analysis or arguments developed by such works.[239]

This is not to say that authors, both official and unofficial, were not active in the area of theory and doctrine when it came to the USAF's experience in Vietnam. As the years passed and interest in Vietnam was rekindled by other insurgencies such as Afghanistan, El Salvador, and Nicaragua, more analytical and balanced examinations of Vietnam appeared. Drew and other authors noted that while the catchphrase had changed to low intensity conflict, insurgency was still a topic for analysis. These authors stressed that protracted revolutionary warfare, insurgency, or low intensity conflict should concern policy makers and the military. One author reminded his readers, "the simple fact is that once armed insurgency has commenced, it becomes the functional equivalent of a total war of national survival in which only one of the two contenders for power will be extant at war's end."[240] However, insurgency conflicts were not completely ignored. A few official conferences and publications in the 1980s and 1990s examined airpower's role in insurgency conflicts. In December 1990, the Army and Air Force published a pamphlet focused on low intensity conflict that introduced a new strategy called internal defense and development (IDAD). Two years later, on 3 November 1992, the Air Force introduced an operational level manual for foreign internal defense, which examined counterinsurgency within the framework of the IDAD strategy.[241]

The later publication opened its discussion of IDAD by declaring that "the aerospace role in development and mobilization focuses on administration and nation building." To this end, the pamphlet's authors stated that this is especially true "where ground lines of communication cannot be established and maintained because of terrain or enemy presence, aerial logistic and communication networks carrying information, supplies, and services to civilian elements establish a critical link between the government and the population."[242]

AFMAN 2-11, *Foreign Internal Defense Operations,* concludes, "aerospace power contributes most effectively when it functions as an integrated, joint component of the overall internal defense effort. It is least effective when employed uni-

laterally as a substitute for ground maneuver or long-range artillery." The author asserts that "in many instances, air support can be exploited to its greatest advantage by emphasizing surveillance and logistic mobility over firepower." "Insurgents generally possess no air capabilities. They have no heartland, no fixed industrial facilities, and few interdictable lines of communication." The manual also concludes that the enemy's "irregular forces are deployed in small units that usually present poor targets for air attack."[243] While it is impossible to suppose the author's motives for these statements, clearly such doctrinal theories seem to have been influenced—at least indirectly—by the US Air Force's experience in the Vietnam War. There is an emphasis on joint operations and nonstrategic nonbomber airpower roles. B-52s are not mentioned in this context. In the AFMAN 1-1 of 1992, the role of such intercontinental aircraft is clearly laid out as a strategic strike weapon. Even though by 1992 the Soviet threat was all but mute and B-52s had once again been used in their ground support role in the Gulf War, according to doctrine they were still primarily a nuclear strike weapon.

In spite of AFMAN 2-11's concise statement of airpower insurgency doctrine, the manual was never very important to the overall formulation of Air Force doctrine or theory. AFMAN 1-1 1992 did not carry this doctrinal view to a higher level. The theories mentioned in AFMAN 2-11 were buried in this operational manual that few even knew existed and fewer still bothered to read.[244] The great changes in Air Force doctrine in the 1990s were not about insurgency but a new look at the strategic role called parallel warfare. Col John A. Warden III and then Lt Col David A. Deptula (now major general)—authors of the Gulf War air campaign—developed what some experts called the most important new airpower theories since Douhet and Mitchell. Indeed, Warden and Deptula's development of parallel warfare and the profound effect of high technology on modern and future wars has garnered most of the attention of official and nonofficial airpower thinkers since the Gulf War.[245] In the late 1990s it was proved again in southeastern Europe on a much more determined and skilled opponent.

In *Storm over Iraq*, Dr. Richard P. Hallion notes, the greatest airpower lessons learned from Vietnam have been technological. The Gulf War demonstrated the vast array of technologically superior weapons that the United States has developed following Vietnam. Target detection and location systems are vastly superior, stealth technology, avionics systems, superior precision-guided munitions, and night capability are only a few of the important advances witnessed in Desert Storm. But the Gulf War was a conventional war, and thus insurgency issues did not filter into the official doctrine created just after the war.[246]

In many ways, the Vietnam experience has had a reverse impact on operations. Airpower has been applied in America's most recent operations (e.g., the Persian Gulf War, Bosnia, and Kosovo) not according to the old theory of tactical aircraft performing only tactical roles and strategic aircraft performing only strategic roles but bomber, fighter, and fighter-bomber air assets—often carrying precision ordnance—accomplishing a variety of tactical and strategic missions. In these cases, circumstances dictate usage. Airmen no longer refer to aircraft as tactical or strategic aircraft rather tactical or strategic assets that they realize can perform a variety of missions. Does this suggest that all future air campaigns will be fought under the same conditions as the Persian Gulf? The Bosnian and Kosovan intervention suggests, this will not be the case. Thus, one must ask: What if the United States finds itself in a low-intensity insurgency conflict containing jungle terrain and climate? Will Air Force doctrine and theory provide airmen with the foundation necessary to successfully prosecute such a war?

But before continuing such speculation, it is worth mentioning again one additional implicit and subtle effect from the Vietnam War on the Air Force selection of senior officers and thus also indirectly on doctrine, theory, and policies. While it is difficult to prove that Vietnam was the primary cause, it is interesting to note that before 1973, the CSAFs were almost all strategic bomber navigators, advocates, pilots, and experts. Subsequently, all CSAFs have had little—if any—bomber background and have been far more familiar with transport,

fighter, and tactical airpower and alternative strategic and nonstrategic nonbomber airpower roles.[247]

It is worth noting that General Fogleman, one of the most recent former CSAFs, commanded the USAF's Air Mobility Command and US Transportation Command prior to assuming his CSAF position. He was also an advocate of the key role of joint operations in modern combat as well as a leading proponent of the need for sound airlift and sealift theory and doctrine.[248] It is also worth reiterating that in 1992, SAC—the backbone of the Air Force's strategic bombing role—was disbanded as a MAJCOM and incorporated into the ACC. As Dr. Drew declares, these changes most certainly seem to be "much more than mere coincidence."[249]

In spite of these implied influences, the overall and direct impact of the insurgency aspects of the Vietnam War on official Air Force doctrine has been negligible. In the case of B-52s, this lack of influence on doctrine and theory can best be explained by the confusion and disagreement caused by the effectiveness of Linebacker II and the illusion of potential victory it created. While it is an issue that requires more discussion than this work allows, it is something serious scholars of airpower need to discuss. Some air officers and civilians have suggested that a Linebacker-style campaign, begun in 1965, might have brought the war to a successful conclusion. Such an argument is, of course, not historical in nature; it ignores a myriad of factors at work in Vietnam and internationally, factors which in the eight years of major US involvement mutated and changed totally or by degrees.[250]

This argument also ignores the fact that the needed weapon system (B-52 Big Bellies) was not available in large quantities until 1967. Even then, SAC officials were not willing to commit the number of bombers Nixon committed in 1972 for fear of being unprepared to meet their strategic responsibilities.

These are just a few of the factors that determined the outcome of the Second Indochina War and might have modified collateral events resulting in a different kind of air war. Even more to the point, between 1965 and 1972, the fact that the Cold War was altered by détente made overt actions against Hanoi easier. Over this same period, the nature of the war

changed from a counterinsurgency campaign—primarily against southern guerrillas—to a lull period following the Tet Offensive of 1968 and then to a conventional war of unification fought mostly by NVA forces, beginning with the Easter invasion of 30 March 1972. The changing domestic sociopolitical attitudes of the American public, as well as the fluctuating perspectives of government and military leaders, also affected the way the war unfolded and eventually came to an end. Yet these factors do not begin to examine the significant effect which enemy strategy, tactics, and political-diplomatic manipulation had on the outcome of the war.

There are still other authors, experts, and historians—both civilian and military—who suggest that even as late as December 1972 had the United States had the resolve to continue the Linebacker air campaign and recommit US troops, a better resolution could have been attained. Not only does this ignore the aforementioned factors but it also ignores the parameters of limited war constraints that President Johnson seemed unable to grasp but which President Nixon clearly perceived as inviolate. Given the political climate of the time, no serious scholar would argue that Nixon could have recommitted troops.

Conclusions

Whatever the truth of the above speculations and while current theory and doctrine is well grounded in the current world situation, it has left it to others to examine and speculate on necessary policies should another Vietnam occur. One should ask, could this doctrine be adapted to another Indochina-style conflict, since current doctrine certainly does not fully address this issue? Perhaps what is needed first is a professional, impersonal examination of such issues not just with regard to Vietnam but also with regard to US airpower in all the major wars in which it has participated, both in victory and defeat.

As for the B-52, one need only recall what its role was when US involvement in SEA escalated in 1964 and what Air Force leaders wanted it to be during the war. It was a classic strategic bomber whose job was to deliver nuclear death to America's

primary Cold War enemy, the USSR. When plans for an expanded airpower mission in 1964, the Air Staff especially CSAF LeMay envisioned the B-52s are the focal point of an all-out attack on the heart and soul of NVN from whence came the sustenance for the enemies war effort in the South.

Not long before the Gulf of Tonkin incident, the JCS had directed the DIA to develop a list of strategic targets in NVN. The list better known as the 94-target list contained 94 targets, 82 fixed and 12 rail routes. As General Momyer put it, "these 94 targets were considered to have the most direct relationship to North Vietnamese war-making capacity and will to fight."[251] Most of the targets were in what later became RP 6 near Hanoi and Haiphong.

It was around this list that the Air Staff also created an all-out air campaign against the North. While eventually, the list would grow to 244 active and 265 contingency targets by 1967, it remained the original 94 targets which Air Force leaders urged the JCS and Department of Defense to use to defeat the Communists. After the Gulf of Tonkin incident in August 1964, General LeMay urged unsuccessfully for full-scale retaliation built around B-52s and the 94-target plan. When Gen John P. McConnell became CSAF on 1 February 1965, he convinced the JCS of a three-phase campaign based on the plan. President Johnson and SECDEF McNamara rejected this plan for fear of enlarging the war.[252]

Rolling Thunder—which began on 2 March 1965 and lasted until 31 October 1968—opened some of these targets to attack but under such restrictions and through such fits and starts, as to render far less effective. The B-52s that were supposed to be a part of these attacks were held south of the 20th parallel. Both Johnson and Nixon were hesitant to use the massive strategic weapon against northern targets that might have caused collateral damage and large numbers of civilian casualties. Johnson, with his overweening concern not to expand the war and to mollify world opinion—restricted airpower, especially the use of B-52s.

This continued through much of Nixon's early presidency. Added to this was his concern about domestic decent. However, Nixon did expand the interdiction role of the B-52s dur-

ing Commando Hunt (1968–72). It was the Linebacker I attacks that began in May 1972, in response to the Easter invasion by the NVA, which opened up the target list to airpower and Arc Light raids. This was followed by Linebacker December bombing which forced the eventual peace. As Clodfelter notes in Linebacker II Nixon became the "mad bomber" able to use B-52s in campaigns that airmen had long envisioned in a strategic role for which it had been created. In the end, this was the only time these targets were hit with consistency or with the full fury of US airpower. In the end, B-52s gained the peace, but they nor the prevailing theory nor doctrine of the time could save South Vietnam. Instead, larger geopolitical and domestic issues ended the Second Indochina War.

Ultimately, America did not lose in Vietnam for lack of an air effort, even though one can argue that the lack of a focused air effort over the North from 1965 to 1968 and the collateral damage wrought in the South by the air campaigns cost the allies popular support and squandered any real possibility of a military success. The fact remains that between 1964 and 1973 US aircraft dropped eight million tons of bombs and lost over 2,000 aircraft, more than they deployed to fight in Desert Storm. Between 18 June 1965 and 15 August 1973, SAC scheduled 126,663 B-52 combat sorties and launched 126,615. Of these, 125,479 actually reached the target, and 124,532 released bombs. More than 55 percent of these sorties were flown in South Vietnam, 27 percent in Laos, 12 percent in Cambodia, and 6 percent in NVN. Altogether, the USAF lost 31 B-52s, 18 to enemy fire over NVN. Half of the American money spent on the war, about $200 billion, was spent on US aerial operations.[253]

Johnson's use of airpower grew out of his own preconceptions of history and was deeply influenced by the advice he received from his closest advisers, such as McNamara, McGeorge Bundy, and Dean Rusk. Vietnam presented Johnson and his advisers with a conflict that their experiences and expectations had not prepared them to fight. They had no theory of victory or political redress, no Gulf War coalition, and no understanding of what Edward E. Rice called "Wars of the Third Kind" from which to formulate tactics or policies.[254] It left the

United States in a position of knowing what to achieve but unable to formulate a plan to reach the goal. It also caused them to employ airpower ineffectively. Under heavy restrictions, tactical planes flew mostly strategic missions while B-52s flew ground support and interdiction missions which Air Force leaders were justifiably loath to support.

In the case of B-52s, they did not and could not win the Second Indochina War because there were no sound US theories of victory; and the policy derived from this malaise—especially in the 1960s—meant that no weapon no matter how powerful could overcome such shortcomings. Airpower doctrine gave only brief consideration to the problem of insurgency, and airmen—given the prevailing political constraints of the day—never really could turn airpower into a means to victory until 1972, when it could fight a conventional bomber war. And in spite of postwar hindsight dreams of victory, by late 1972 it was too late to win anything approaching a real victory.

This raises a question similar to that eternal question of what came first, the chicken or the egg? In the case of the military in general and airpower in Vietnam specifically, it begs the equally difficult question of which comes first advances in weapons and technology or maturation of theory and doctrine. It is a question I do not propose to answer here, partly because it is a question that may not have an answer. The Vietnam War left most airmen and airpower experts frustrated by its conclusion and caused many to say, with some justification, this is what you get when airmen do not fully control air assets and run the air war.

After America's withdrawal from the war, these painful memories, bitter legacies, and misconceptions about the nature and conclusion of the war—as well as disagreements over the very nature of the remaining strategic role of the Air Force against the Soviet Union in the 1980s—made it easy for many students of airpower to assign the air war in Vietnam to the trash bin of history. Most airmen simply found it more comfortable to retire into the more familiar issues of nuclear warfare and the European scenario. But this is not an effort to condemn these airmen; rather, it is an explanation of why they did not choose to wrestle with the 500 lb Vietnamese guerrilla.

With this in mind, it is also worth recalling again that as important as Vietnam was, it was only part of a much larger geopolitical struggle whose main participants were by 1972 more concerned with events in distant lands. Ultimately, one must remember that the primary role of B-52s was to act as a deterrent to a hot war with the USSR and, failing this, to evaporate them in a mushroom cloud. As a deterrent, eventually the BUFFs succeeded, and even if B-52s could not win this bitter sojourn in Vietnam, they ultimately helped the United States to win the larger Cold War conflict. But that is another story.

Notes

1. Col Dennis M. Drew, "Vietnam, 'Wars of the Third Kind' and Air Force Doctrine," paper presented at Texas Tech University Center for the Study of the Vietnam Conflict, seminar on the Vietnam War, 18–21 April 1996, 1fn. For details on "Wars of the Third Kind," see Edward E. Rice, *Wars of the Third: Conflict in Underdeveloped Countries* (Berkeley, Calif.: University of California, 1988).

2. Drew; and Air Force Manual (AFMAN) 1-1, *Basic Aerospace Doctrine of the United States Air Force*, vol. 1, March 1992, vii.

3. Air Force Doctrine Document (AFDD) 1, *Air Force Basic Aerospace Doctrine,* 1 September 1997.

4. Ibid., 1

5. Ibid.

6. Ibid., 2.

7. Drew.

8. For details on these theories, see Giulio Douhet, trans. Dino Ferrari *The Command of the Air* (1942; new imprint, Washington, D.C.: Office of Air Force History [AFHO], 1983); Brig Gen William L. "Billy" Mitchell, *Our Air Force: The Keystone to National Defense* (New York: Dutson, 1921); idem, *Winged Defense: The Development and Possibilities of Modern Air Power, Economic and Military* (New York: G. P. Putnam, 1925). For a very clear and concise modern interpretation of traditional Air Force roles, policies, theories, and doctrine, see Col Phillip S. Meilinger, *10 Propositions Regarding Air Power* (Washington, D.C.: Air Force History and Museums Program, 1995).

9. John Keegan, "Please, Mr. Blair, Never Take Such a Risk Again," *Daily Telegraph* (London), 6 June 1999.

10. Drew, 11; AFMAN 1-2, *Air Force Basic Doctrine,* September 1953; idem, *Air Doctrine, United States Air Force Basic Doctrine,* April 1954 and April 1955; idem, and *United States Air Force Basic Doctrine,* December 1959). Subsequent USAF basic doctrine manuals were marked AFMAN 1-1 beginning with the following basic doctrine publication in the fall of 1964.

11. Drew, 11.

12. Ibid.; AFMAN 1-3, *Theater Air Operations,* September 1953 and April 1954. The next edition of this publication did not appear until June 1965 and was redesignated AFMAN 2-1.

13. Drew, 7; G. J. M. Chassin, "Lessons of the War in Indochina," *Interavia* 7, no. 12 (1952): 670–75.

14. Drew, 8; Bureau of Commander in Chief, Indo-China, *Notes on Combat in Indo-China,* vol. 1, 1954; Supreme Command, Far East, *Lessons from the Indo-China War,* vol. 2, 1955 and vol. 3, 1956. While the first official copies did not reach US defense officials until 3 January 1967, it is likely the English-language versions were available much earlier.

15. Gen Ronald R. Fogleman, "Aerospace Doctrine: More than Just a Theory," *Airpower Journal,* Summer 1996, 41.

16. Robert Frank Futrell, *Ideas, Concepts, and Doctrine:* vol. 2, *Basic Thinking in the United States Air Force, 1961–1984* (Maxwell Air Force Base [AFB], Ala.: Air University Press, 1989), 63; and *Public Papers of the Presidents of the United States: John F. Kennedy, 1962* (Washington, D.C.: Government Printing Office [GPO], 1963), 900–910.

17. Futrell, 75–91.

18. Ibid., 63–64; and Gen Curtis E. LeMay, CSAF, address to the Air Force Association Convention, Philadelphia, Pa., 21 September 1961, in *Air Force Information Policy Letter for Commanders,* supplement, 15 November 1961, 1–6.

19. John F. Loosbrok, editorial, *Air Force/Space Digest,* January 1963, 28–31.

20. Futrell, 155–60, 226–30. For more on Zuckert's policy changes, see Eugene Zuckert, "Keeping the Organizational Engine in Tune," *Air Force/Space Digest,* October 1964, 37–40.

21. For details on this period, see Stanley Karnow, *Vietnam: A History* (New York: Viking, 1983), specifically pages 161–348.

22. Earl H. Tilford Jr., *Crosswinds: The Air Force's Setup in Vietnam* (College Station, Tex.: Texas A&M University Press, 1993), 33–34, 66.

23. *Pentagon Papers,* vol. 3, *Department of Defense History of United States Decision Making in Vietnam,* Sen. Mike Gravel ed. (Boston: Beacon Press, 1971), 207.

24. Marcelle Size Knaack, *Encyclopedia of US Air Force Aircraft and Missile Systems,* vol. 2, *Post–World War II Bombers, 1945–1973* (Washington, D.C.: AFHO, 1988), 206–22; *Year By Year: 75 Years of Boeing History, 1916–1991* (Seattle, Wash.: Boeing Historical Archives, 1991), 72–73; *Pedigree of Champions: Boeing since 1916,* 6th ed. (Seattle, Wash.: Boeing Co., 1985), 50–51; William W. Suit, "Utilitarian War Horse: Modifying the B-52 for Conventional War," *Air Power History,* Winter 1997, 38–39.

25. Tilford, 11; Knaack, 222–23; *Year By Year,* 73; Suit, 39; Robert Frank Futrell, *Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force, 1907–1960* (Maxwell AFB, Ala.: Air University Press, 1989), 126.

26. Knaack, 223–35; *Pedigree of Champions,* 50–51; and *Year By Year,* 73–74.

27. Tilford, 25; and Futrell 1:256, 271.

28. Knaack, 235–44; *Pedigree of Champions,* 51; Kenneth L. Patchin and James N. Eastman, *The B-52 Stratofortress,* vol. 2, *B-52 Logistical Support* (Tinker AFB, Okla.: OCAMA/Office of Information [OI], History Office, July 1961), 27–28 (quote p. 28). Some other early studies on B-52 development include Ron E. Caywood, *Major Problems in the B-52 Conversion Program, 1955–1958* (Offutt AFB, Nebr.: SAC/History Office, n.d.); Warren E. Greene, *The Development of the B-52 Aircraft, 1945–1953* (Wright-Patterson AFB,

Ohio: AMC/History Office, 1956); Harland B. Moulton and Ron E. Caywood, *The History of the B-52: Background and Early Development, 1946–1954* (Offutt AFB, Nebr.: SAC/History Office, n.d.); and Lloyd S. Jones, *U.S. Bombers*, 3d ed. (Fallbrook, Calif.: Aero Publishers, 1980). It should be noted that the term *BUFF*, often used by airmen to lovingly describe the B-52, stood for "Big Ugly Fat Fellow." To many airmen it also stood for "Big Ugly Fat F-----."

29. Knaack, 260–84, 288, 291; *Pedigree of Champions*, 51; *Year By Year*, 74, 117; and Suit, 39–41, 43.

30. Knaack, 245–57; *Pedigree of Champions*, 50–51; and Suit, 42–43. For details from an earlier publication see, *US Air Force Fact Sheet*, subject: B-52 in Southeast Asia, Study no. 68-19, 1968. For an official history of the "Big Belly" see Kenneth L. Patchin and Bill B. Stacy, *Southeast Asia, B-52 Logistics Support for CY66* (Tinker AFB, Okla.: OCAMA/OI, August 1967), 1–2, 22–36, 89–92.

31. Futrell, 2:171–73, 242, 251–52.

32. Curtis E. LeMay, "Air Power in Guerrilla Warfare," *Air Force Information Policy Letter for Commanders* (Washington, D.C.: Office of the Secretary of the Air Force, 15 April 1962); and Drew, 12–13.

33. AFMAN 1-1, *United States Air Force Basic Doctrine*, 14 August 1964, chap. 6.

34. Drew, 13–15.

35. Futrell, 2:228. Original quote in Gen Bernard A. Schriever, "Forecast," *Air University Review*, March–April 1965, 3.

36. Futrell, 2:228.

37. Ibid., 231.

38. Ibid., 233.

39. Ibid., 232–35.

40. For general information on Arc Light, see John F. Guilmartin Jr., "Arc Light," in *Encyclopedia of the Vietnam War*, ed. Stanley I. Kutler (New York: Charles Scribner's Sons, 1996), 48. For details on Arc Light operations, see J. C. Hopkins and Sheldon A. Goldberg, *The Development of the Strategic Air Command, 1946–1986: The Fortieth Anniversary History* (Offutt AFB, Nebr.: SAC/History Office, 1986); Headquarters SAC, "Activity Input to Project Corona Harvest–Arc Light Operations, 1 Jan 65–31 Mar 68," USAF special study, 3 vols.; Carl Berger, ed., *The United States Air Force in Southeast Asia, 1961–1973: An Illustrated Account* (Washington, D.C.: AFHO, 1984); and John Schlight, *The Air War in South Vietnam: The Years of the Offensive, 1965–1968* (Washington, D.C.: AFHO, 1988).

41. *The Joint Chiefs of Staff and the War in Vietnam, 1960–1968*, pt. 2, 24-1, 2; History, SAC, January–June, 1965, 198; and Schlight, 49.

42. Ibid.

43. SAC, "Activity Input to Project Corona Harvest, Arc Light" (Offutt AFB, Nebr.: SAC/History Office, 1970), 2:2; History, SAC, January–June, 1964; Message, 140805Z MAY 65, Commander, US Military Assistance Command, Vietnam (COMUSMACV) to Commander in Chief Pacific Command (CINCPAC), 14 May 1965; Schlight, 50; Larry Cable, *Unholy Grail: The U.S. and the Wars in Vietnam, 1965–1968* (London: Routledge, 1991), 98–100, 109.

44. SAC, "Activity Input to Project Corona Harvest, Arc Light," 2:2–3, 5–9, 12–13 (quote p. 5); History, 3d Air Division, January–June 1967, 134; History, CINCPAC, 1967, 2:711; Corona Harvest (CH), *A Chronology of Important*

Airpower Events in Southeast Asia, 1950–1968 (Maxwell AFB, Ala.: Aerospace Studies Institute, Air University, 1 May 1969), 222; and Director of Operations, DCS, Plans and Operations, Headquarters USAF, study, "Analysis of B-52 Conventional Operations in SEA," 29 October 1965.

45. Message, 190330Z MAR 65, COMUSMACV to Joint Chiefs of Staff (JCS), 19 March 1965; Message, 292147Z APR 65, JCS to CINCPAC, 29 April 1965; Schlight, 50; and History, SAC, July–December 1965, 2:267.

46. Schlight, 51–52; Message, 150305Z JUN 65, COMUSMACV to JCS, 15 June 1965; and Air Force Plans Division (AFXOPJ), memorandum to Chief of Staff Air Force, subject: Changes in Planning and Execution of Arc Light I, 24 June 1965.

47. Schlight, 51–52.

48. Ibid., 52–53 (quote p. 53); Hopkins and Goldberg, 131 (quote p. 131); Message, 181004Z JUN 65, JCS to DIRNSA, 18 June 1965; CH, *A Chronology of Important Airpower Events in Southeast Asia*, 103. It should be noted that since this raid the gnat quote has been altered and retold in many variations such as it was like a "housewife using a sledgehammer to kill house flies."

49. History, Military Assistance Command, Vietnam (MACV), January 1972–March 1973, 191–92; Schlight, 53–54 (first quote); and CH, *A Chronology of Important Airpower Events in Southeast Asia*, 104 (second quote).

50. CH, *A Chronology of Important Airpower Events in Southeast Asia*, 114; Schlight, 54–55, 82–83; History, SAC, July–December 1965, 2:270–71; Message, Zippo 08-225, 02/1255Z AUG 65, 7th Bomb Squadron to Assistant Inspector General 673, 12 August 1965; and History, MACV, January 1972–March 1973, 166–67. For precise details on every major ground operation and their Arc Light and air support components, see Cable, 41–47, 98–99, 109, 191–92.

51. For details, see William W. Momyer, *Air Power in Three Wars* (Washington, D.C.: GPO, 1978), 283–88; Pacific Air Forces (PACAF), CH, *Command and Control*, bk. 2, pt. 2, 4–20; PACAF, CH, *Out-Country Report*, bk. 1, 31, 83 and bk. 2, 60; Berger, 150; History, SAC, July–December 1965, 279–86.

52. Suit, 41–42. For details, see Patchin and Stacy, 1–2, 22–92; SAC, "Activity Input to Project Corona Harvest, Arc Light," 2:10–11; Knaack, 245–47, 257–59; *Pedigree of Champions*, 50–51; and OCNAO to OCPWA, letter: External Navy Mine Carriage, 2 August 1966.

53. SAC, "Activity Input to Project Corona Harvest, Arc Light," 2:16–18; and Study, RAND Corporation, "Air Interdiction in Southeast Asia, 1966," iii.

54. CH, *A Chronology of Important Airpower Events in Southeast Asia*, 167; SAC, "Activity Input to Project Corona Harvest, Arc Light," 2:16–17; Message, 15/1445Z MAR 66, Zippo 0731, SAC to JCS, 15 March 1966; and Suit, 42. For more on Rolling Thunder and interservice rivalries see Tilford, *Crosswinds*; Larry Cable, "The Operation Was a Success, but the Patient Died: The Air War in Vietnam, 1964–1969," in *An American Dilemma: Vietnam, 1964–1973*, ed. Dennis Showalter and John G. Albert (Chicago: Imprint Publications, 1993), 109–58.

55. Cable, "The Operation Was a Success," quote on p. 149; Seventh Air Force, memorandum to PACAF, subject: B-52 Operations, 061234Z October 1966; Momyer, 97–102; idem, "End of Tour Report [EOTR], Seventh Air Force," 9.

56. Momyer, *Air Power in Three Wars*, 99–102. Momyer laid out these issues in memorandum to Maj Oakah L. Jones, PACAF, subject: B-52 Concept, 7 August 1966; and Schlight, 149.

57. Futrell, 2:301–2.

58. Ibid., 302–3. Original in Richard H. Kohn and Joseph P. Harahan, eds., *Air Superiority in World War II and Korea: An Interview with Gen. James Ferguson, Gen. Robert M. Lee, Gen. William Momyer, and Lt. Gen. Elwood R. Quesada* (Washington, D.C.: AFHO, 1983), 69–70.

59. Futrell, 2:191. Original quote in Air Force Regulation 1-1, *Aerospace Doctrine: Responsibilities for Doctrine Development*, 20 March 1963.

60. Futrell, 2:288.

61. Ibid., 298. Original in United States Senate, *DOD Appropriations for FY75: Hearings before a Subcommittee of the Committee on Appropriations*, 93d Cong., 2d sess. 1974, pt. 2, 4389–95.

62. Futrell, 2:303. Original quote in Bruce Palmer, ed., *Grand Strategy for the 1980s* (Washington, D.C.: American Enterprises Institute for Public Policy Research, 1978), 67.

63. CH, *In-Country Air Strikes Operations, Southeast Asia, 1 Jan 65–31 Mar 68* (Washington, D.C.: AFHO, 1971); Momyer, *Airpower in Three Wars*, 101–3 (quote); idem, EOTR, 9; idem, memorandum to McConnell, 11 November 1966; Message, Seventh Air Force to PACAF, 22 September 1966; and Schlight, 149–50.

64. Futrell, 2:283. Quote in William C. Westmoreland, *A Soldier Reports* (Garden City, N.Y.: Doubleday, 1976), 343.

65. Futrell, 2:283; and Douglas Kinnard, *The War Managers* (Hanover, N.H.: University of Vermont Press, 1977), 62.

66. History, SAC, January–June 1966, 138 (first quote); Schlight, 152–53; and CH, *A Chronology of Important Airpower Events in Southeast Asia*, 177–82, 186 (second quote). See also Message, 12/2331Z MAY 66, COMUSMACV to Defense Intelligence Agency, 23 May 1966; History, 3d Air Division, January–June 1966, vol. 1, xi; Message 12571, 11/1359Z APR 66, COMUSMACV to CINCPAC, 11 April 1966; Message, 12/0600Z APR 66, American Embassy Vientiane to CINCPAC, 12 April 1966; Message, 14/0316Z APR 66, Zippo 0496, 4133 BWP to AIG 673, 14 April 1966; and Message, 15/1303Z APR 66, 13067, COMUSMACV to CINCPAC, 15 April 1966.

67. CH, *A Chronology of Important Airpower Events in Southeast Asia*, 185–86; and Message, 13/0952A MAY 66, CINCPAC to COMUSMACV, 13 May 1966.

68. Schlight, 153, 213; History, SAC, January–June 1966, 106, 138; Charles K. Hopkins, *SAC Bomber Operations in the Southeast Asia War*, Study 204, vol. 1 (Offutt AFB, Nebr.: SAC/History Office, 1985), 168; and Deputy Secretary of Defense, memorandum to Chairman JCS, 1 September 1966.

69. CH, *A Chronology of Important Airpower Events in Southeast Asia*, 197–99; Message, 0478 30/0448Z JUN 66, 3d Air Division to Headquarters SAC, 30 June 1966; Berger, 151; and History, SAC, January–June 1966, 139.

70. SAC, "Activity Input to Project Corona Harvest, Arc Light," 3:1, 15, 49; CINCSAC to CSAF, letter, no subject, 26 August 1967; and Suit, 42.

71. CH, *A Chronology of Important Airpower Events in Southeast Asia,* 221.

72. Ibid., 227, 231; History, SAC, January–June 1966, 145; History, SAC, January–June 1967, 131; and Message, AFXOPDO 89449, 02/1942Z MAR 67, CSAF to SAC, 2 March 1967.

73. Berger, 151–56; Schlight, 250–58; Cable, *Unholy Grail,* 191–93; CH, *A Chronology of Important Airpower Events in Southeast Asia,* 235, 238; and Message, DITW 07560, 18/2205Z JULY 67, SAC to AIG 667 et al., 18 July 1967, 10. The actual nature of Nguyen Chi Thanh's death remains a controversy to this day. The Socialist Republic of Vietnam officially declares that he died of a heart attack. Some authors have recently intimated that internal political rivals assassinated him. Some have even suggested that he died of a heart attack brought on by a bombing raid. To me the best evidence strongly suggests that he died during a B-52 raid. How he died is debatable.

74. Berger, 156; CH, *A Chronology of Important Airpower Events in Southeast Asia,* 252, 254; History, SAC, July–December 1967, 18; and History, Seventh Air Force, 1 July–31 December 1967, 21.

75. "Jason Report," *Pentagon Papers,* 4:227, 275; and Tilford, 88, 96, 97.

76. Tilford, 96–97; and Lawrence J. Korb, *The Joint Chiefs of Staff: The First Twenty-Five Years* (Bloomington, Ind.: University of Indiana Press, 1976), 181. For an excellent account of the tense relationship between Johnson and his military leaders see, Col Herbert Y. Schandler, "The President, the Secretary of Defense, and the Joint Chiefs of Staff: The Political Direction of the War," paper presented to the 1996 Vietnam Symposium, Texas Tech University, 18 April 1996. During those fateful days Schandler, a liaison officer for the secretary of defense, saw many of these events firsthand.

77. PACAF, CH, *Command and Control,* bk. 1, pt. 2, 25; History, SAC, July–December 1967, 152–53; CH, *A Chronology of Important Airpower Events in Southeast Asia,* 261–63, 268; Berger, 156–57; Message, 10/1830Z FEB 68, SAC/Vice Commander to CINCPAC, 19 February 1968. The Tet offensive also began in January.

78. CH, *A Chronology of Important Airpower Events in Southeast Asia,* 273–74; History, Seventh Air Force, 1 January–30 June 1968, xxii; Headquarters Seventh Air Force, "Weekly Air Intelligence Summary," Report, no. 6819, 11 May 1968; and Berger, 156–57.

79. Quotes in Schlight, 292; and Berger, 157.

80. CH, *A Chronology of Important Airpower Events in Southeast Asia,* 276; History, Seventh Air Force 1 January–30 June 1968, xxiv; and Berger, 157, 160.

81. Drew, 10; and William R. Becker, "Air Power in the Fight against Guerrillas" (Maxwell AFB, Ala.: Air Command and Staff College [ACSC], 7 May 1962), 91.

82. See Becker. See also John L. Phipps, "Basic Problems in Counter-Guerrilla Air Operations" (Maxwell AFB, Ala.: ACSC, 7 May 1962); William C. Lockett Jr., "COIN in the Air: A Study of the Role of Airpower in Counterinsurgency" (Maxwell AFB, Ala.: ACSC, 22 April 1963); William J. Thorpe, "HUK Hunting in the Philippines, 1946–1953," *Airpower Historian,* April 1962, 95–100.

83. Robert Kipp, "Counterinsurgency from 30,000 Feet," *Air University Review,* January–February 1968, 10–18.

84. Drew, 22; and AFMAN 2-5, 10 March 1967, 13, 18.

85. Drew, 22–23; AFMAN 2-5, 14–16.
86. Drew, 12; and Futrell, 2:257–58.
87. Drew, 13.
88. Gilbert L. Pritchard, "Communism and Counterinsurgency: The Air Force Role in Combined Support Action," *Air Force Information Policy Letter Supplement for Commanders, no. 113* (Washington, D.C.: Office of the Secretary of the Air Force, 3 November 1962).
89. Futrell, 2:316.
90. Ibid., 316–17.
91. Ibid., 317.
92. Futrell, 2:317–18.
93. Ibid., 318–19.
94. Ibid., 320.
95. Ibid.
96. Ibid., 321.
97. Ibid., 321–22. Original in Col John E. Van Duyn, chief, Corona Harvest Project, to commander (CC), Air University, letter, subject: EOTR, 16 March 1972; and Col Robert L. Gleason, chief, Corona Harvest Project, to AU/CC, letter, subject: EOTR, 1 July 1973.
98. Futrell, 2:322; and Gleason.
99. Futrell, 2:322–23.
100. Gen William W. Momyer, memorandum to Gen Richard H. Ellis, subject: Corona Harvest In-Country Air Strike Operations, Southeast Asia, 1 Jan 65–31 Mar 68, 1 July 1974.
101. Drew, 14–16.
102. Ibid., 16–17.
103. Earl H. Tilford Jr., "Bombing Our Way Back Home: The Commando Hunt and Menu Campaigns of 1969–1973," in *Looking Back on the Vietnam War: A 1990s Perspective of Decisions, Combat, and Legacies*, ed. William Head and Lawrence Grinter (Westport, Conn.: Greenwood, 1993), 123–24.
104. Ibid. Seamans's original remarks appeared as SECAF Robert C. Seamans Jr., address, 1969 Air Force Association Convention, Houston, Tex., 19 March 1969; and "Continuing Cooperation between NASA and DOD," *Air Force Magazine*, May 1969, 100.
105. Seamans, 129; Henry A. Kissinger, *The White House Years* (Boston: Little, Brown and Co., 1979), 241–42.
106. Berger, 160; Tilford, *Crosswinds*, 125–26; idem, "Bombing Our Way Back Home," 129; and Kissinger, 247. Original in Gen John Ryan, USAF chief of staff, memorandum to Sen. John C. Stennis, chair, Senate Committee of the Armed Services, subject: Hearings before the Committee on Armed Services, 93d Cong., 1st sess., 26 July 1973, 121–22.
107. Tilford, *Crosswinds*, 126–27; John Morrocco, *Rain of Fire: Air War, 1969–1973*, ed. Robert Manning, Vietnam Experience Series (Boston: Boston Publishing Co., 1986), 12. Maj Hal Knight blew the whistle of the secret bombings when he wrote Sen. William Proxmire a letter on 18 January 1973 requesting a "clarification" of US policies in Cambodia. The letter appears along with subsequent testimony in the Armed Services Committee Hearings mentioned in the previous note.
108. Tilford, *Crosswinds*, 126–27; and Morrocco, 12.
109. Kissinger, 240; Tilford, *Crosswinds*, 128; and idem, "Bombing Our Way Back Home," 130–31. For enemy attitudes on the Cambodian bombing

see Truong Nhu Tang, *A Vietcong Memoir: An Inside Account of the Vietnam War and Its Aftermath* (New York: Harcourt Brace and Jovanovich, 1985).

110. Eduard Mark, *Aerial Interdiction: Air Power and Land Battle in Three American Wars* (Washington, D.C.: Center for Air Force History, 1994), 329. For more on the Vietminh struggle against the French, see Karnow, 128–205. It should be noted that the National Liberation Front (NLF) was not an arm of the northern government. In fact, many members of the NLF were noncommunists and opposed reunification, even after the United States departed. Many scholars have noted this fact in such works as Cable's *Unholy Grail*.

111. Mark, 329–30. For more on Ngo Dinh Diem, see Karnow, 206–311.

112. Mark, 330–31. For more on these deepening commitments, see Karnow, 319–48 (pp. 330–34 cover the NVA buildup, quotes on p. 334).

113. Mark, 331–32; and History, MACV, January 1972–March 1973, 35–36, 43–44.

114. CH, *A Chronology of Important Airpower Events in Southeast Asia*, 294.

115. Berger, 109–19; Tilford, "Bombing Our Way Back Home," 126–27. For more on gunships, see Jack S. Ballard, *The United States in Southeast Asia: Development and Employment of Fixed-Wing Gunships, 1962–1972* (Washington, D.C.: AFHO, 1982). For more on Commando Hunt, see pp. 45, 262.

116. CH, *A Chronology of Important Airpower Events in Southeast Asia*, 296; PACAF, CH Report, "United States Air Force Operations in Laos: 1 Jan 70–30 Jun 71," Maxwell AFB, Ala., 1971, 25; and J. William Gibson, *The Perfect War: Technowar in Vietnam* (Boston: Atlantic Monthly Press, 1986), 396–97.

117. Tilford, "Bombing Our Way Back Home," 127–28.

118. Berger, 109–10.

119. Ibid., 111.

120. Ibid.

121. Douglas Pike, *PAVN: People's Army of North Vietnam* (Novato, Calif.: Presidio Press, 1986), chap. 1 and Conclusion; and idem, *Vietcong: The Organization and Techniques of the National Liberation Front of South Vietnam* (Cambridge, Mass.: MIT Press, 1966), 85–105.

122. Berger, 111–12, 114; and Tilford, *Crosswinds*, 114.

123. Berger, 114–18.

124. Maj Gen Alton D. Slay, deputy chief of staff, Operations, Seventh Air Force, "End-of-Tour Report, August 1971–August 1972," 20, file K717.13, Air Force Historical Research Agency (AFHRA), Maxwell AFB, Ala.; and Tilford, "Bombing Our Way Back Home," 132–33.

125. Mark, 332–33; and History, Seventh Air Force, Commando Hunt VII, June 1972.

126. Mark, 333–34; and History, Seventh Air Force, Commando Hunt VII, June 1972, 20. For an excellent study detailing the communist supply network see, Bernard C. Nalty, *Interdiction in Southern Laos* (Washington, D.C.: AFHO, 1988), 223–32.

127. Mark, 334–35; and Nalty, 234–48.

128. Berger, 118; Mark, 344; and History, Seventh Air Force, Commando Hunt VII, June 1972.

129. Ibid.

130. Mark, 345–46; and History, Seventh Air Force, Commando Hunt VII, June 1972, 23–27.

131. Mark, 346; and History, Seventh Air Force, Commando Hunt VII, June 1972, 30–33.

132. Berger, 118; Tilford, *Crosswinds*, 138; Mark, 344–45; and History, Seventh Air Force, Commando Hunt VII, June 1972, 14–17, 22–24.

133. History, Seventh Air Force, Commando Hunt VII, June 1972, 48–49, 118–27.

134. Berger, 119; Mark, 345; and History, Seventh Air Force, Commando Hunt VII, June 1972.

135. Mark, 357–58.

136. History, Seventh Air Force, Commando Hunt VII, June 1972, 61, 80; and Slay, EOTR, (quote) p. 30.

137. Quote in Mark, 358; and original in Brig Gen Richard G. Cross, End-of-Tour Report, 22 January 1973, file K740.131.2, AFHRA, Maxwell AFB, Ala.

138. Mark, 358; Berger, 119; Tilford, *Crosswinds*, 138–39 (quote p. 140).

139. Tilford, "Bombing Our Way Back Home," 127–28; PACAF, CH Report, "United States Air Force Operations in Laos: 1 Jan 70–30 Jun 71," 76–79; and Ballard, 173.

140. Mark, 358–59; and History, Seventh Air Force, Commando Hunt VII, June 1972, 80; and Nalty, 250–51. For details on Commando Hunt V, see History, Seventh Air Force, Commando Hunt V, May 1971, Saigon, Republic of Vietnam, 56–57.

141. Col D. L. Evans, director of Intelligence, Task Force Alpha, EOTR, 6 July 1972, 30, file 10015110, AFHRA, Maxwell AFB, Ala.; and Mark, 360 (quotes).

142. Evans, 16; and Mark, 361–62.

143. Nalty, 148 (quote); Mark, 362–63; and Slay, 26.

144. Mark, 335, 347 (quotes); Berger, 119; Tilford, *Crosswinds*, 138–39; Evans, 44, 59; and Slay, 26.

145. Mark, 335; and Nalty, 228–30.

146. Mark, 348–49; and History, Seventh Air Force, Commando Hunt VII, June 1972, 66–67.

147. Mark, 349–50; and Slay, 23–24. For details on sensors, see Michael Horrocks, *The Air Force in Southeast Asia: The Sensor War, 1966–1971* (Washington, D.C.: AFHO, 1985), 17–19.

148. Mark, 350; Slay, 28–29; and History, Seventh Air Force, Commando Hunt VII, June 1972, 47, 133.

149. Mark, 355; History, Seventh Air Force, Commando Hunt VII, June 1972, 89–93; and Evans, 47–48.

150. Mark, 346–47, 355–56; and History, Seventh Air Force, Commando Hunt VII, June 1972, 33–40, 140–41, 231.

151. Mark, 355–56; and History, Seventh Air Force, Commando Hunt VII, June 1972, 139–41.

152. Mark, 348; and History, Seventh Air Force, Commando Hunt VII, June 1972, 39–44.

153. Mark, 356–57; History, Seventh Air Force, Commando Hunt VII, June 1972, 21–22, 51–58, 132–42; and Evans, 48.

154. Mark, 336; and Ballard, 77–175.

155. History, Seventh Air Force, Commando Hunt VII, June 1972, 67, 80–82; Mark, 353 (quote); and original in Slay, 24.

156. Berger, 119; and Tilford, *Crosswinds*, 139.

157. Mark, 329–34; Berger, 109–19; Tilford, "Bombing Our Way Back Home," 126–33; Slay, 20; and History, Seventh Air Force, Commando Hunt VII, June 1972, 14, 20, 89. For an excellent study detailing the communist supply network, see Bernard C. Nalty, *Interdiction in Southern Laos* (Washington, D.C.: AFHO, 1988), 234–48.

158. Mark, 358–60; Berger, 119; Tilford, *Crosswinds*, 138–40; History, Seventh Air Force, Commando Hunt VII, June 1972, 80; Nalty, *Interdiction in Southern Laos*, 250–51; and Futrell, 2:266–67. For details on Commando Hunt V see, History, Seventh Air Force, Commando Hunt V, May 1971, 56–57; Tilford, "Bombing Our Way Back Home," 127–28; Ballard, 173; and Evans.

159. AFMAN 1-1, *United States Air Force Basic Doctrine*, 28 September 1971, 6-1.

160. Drew, 23–24; and AFMAN 1-1, 1971, 6-1.

161. Richard M. Nixon, *RN*, vol. 2, *The Memoirs of Richard Nixon* (New York: Warner Books, 1978), 79, 259; and idem, *In the Arena: A Memoir of Victory, Defeat, and Renewal* (New York: Simon & Schuster, 1990), 335–37.

162. Tilford, *Crosswinds*, 143; Mark Clodfelter, *The Limits of Air Power: The American Bombing of North Vietnam* (New York: Free Press, 1989), 152–53; Mark, 365–66; and Futrell, 2:267–68.

163. Truong, 200–202, 210–13.

164. Kissinger, 1109; and Clodfelter, 153.

165. Bruce Palmer, "U.S. Intelligence and Vietnam," *Studies in Intelligence*, special Spring issue, 1984, 91; and Mark, 368.

166. Capt Charles A. Nicholson, *The USAF Response to the Spring 1972 NVN Offensive: Situation and Redeployment* (Project CHECO, Seventh Air Force/DOAC, 1972), 21 (quote); and Tilford, *Crosswinds*, 143.

167. Capt David Mann, *The 1972 Invasion of Military Region I: Fall of Quang Tri and Defense of Hue* (Project CHECO, Seventh Air Force/CDC, 1973), 13–52; Capt Peter A. W. Liebchen, *Kontum: Battle for the Central Highlands, 30 March–10 June 1972* (Project CHECO, Seventh Air Force/DOAC, 1972), 28–44; and Maj Paul T. Ringenbach and Capt Peter J. Melly, *The Battle for An Loc, 5 April–26 June 1972* (Project CHECO, Seventh Air Force/CDC, 1973), 1–16.

168. Tilford, *Crosswinds*, 146; Slay, 51, 156; and Futrell, 2:275. For details see, Maj A. J. C. Lavalle, ed., *Air Power and the 1972 Spring Offensive*, USAF Monograph Series, vol. 2 (Washington, D.C.: GPO, 1977), 58, 98.

169. Nicholson, 38, 67; Mark, 373; History, Seventh Air Force, 1 Jul 71–30 Jun 72, 273–77; Mark Clodfelter, "Nixon and the Air Weapon," in *An American Dilemma: Vietnam, 1964–1973*, ed. Dennis E. Showalter and John G. Albert (Chicago: Imprint Publishers, 1993), 169; and James R. McCarthy, George B. Allison, and Robert E. Rayfield, *Linebacker II*, vol. 6, *A View from the Rock*, USAF Southeast Asia Series, monograph 8 (Maxwell AFB, Ala.: Air War College, 1979), 11. Also used in this paper is the 1985 revised copy.

170. Nicholson, *NVN Offensive*, 67; Mark, 373; History, PACAF, 1 July 1971–30 Jun 1972, vol. 1, 121–22; Clodfelter, "Nixon and the Air Weapon," 169; Tilford, *Crosswinds*, 145; and History, Seventh Air Force, Linebacker Operations, 10 May–23 October 1972, 1973, 3–5, file K740.04-24, AFHRA, Maxwell AFB, Ala.

171. Nicholson, *NVN Offensive*, 123–24; Mark, 373; and Clodfelter, "Nixon and the Air Weapon," 169.

172. Nixon, *RN*, 2:606; Clodfelter, "Nixon and the Air Weapon," 172; Seymour M. Hersh, *The Price of Power: Kissinger in the Nixon White House* (New York: Summit Books, 1983), 506; and Melvin F. Porter, *Linebacker: Overview of the First 120 Days* (Project CHECO, Seventh Air Force/DOA, 1973), 14–15.

173. Mark, 375; Clodfelter, "Nixon and the Air Weapon," 170, original in MACV, *Linebacker Study* (unofficial/uncoordinated draft report), 20 January 1973, chap. 2, 2, File K712.041-19, AFHRA; Nixon, *RN*, 2:64–65; and PACAF, CH, *USAF Air Operations against NVN, 1 Jul 71–30 Jun 72*, 1973, 52–61.

174. Hersh, 568 (quote); Kissinger, 1118, 1176; Clodfelter, "Nixon and the Air Weapon," 170–71; Mark, 375–76; and Nixon, *RN*, 2:81.

175. PACAF CH, *USAF Air Operations against NVN*, 90–91; Momyer, *Air Power in Three Wars*, 33; Tilford, *Crosswinds*, 149–50; and PACAF CH, *Command and Control*, bk. 1, 1–24. Specifically the report determined that Linebacker I's goal was to: "1) restrict resupply of North Vietnam from external sources; 2) destroy internal stockpiles of military supplies and equipment; and 3) restrict flow of forces and supplies to the battlefield."

176. Porter, 16–17; and Clodfelter, "Nixon and the Air Weapon," 171.

177. Nixon, *RN*, 2:79–80; and Clodfelter, "Nixon and the Air Weapon," 171.

178. Mark, 378–79; PACAF, CH, *USAF Air Operations against NVN*, 65, 121–31; and PACAF, SEA Report, "Air Operations Summaries, April, May, and June 1972," File K717.3063, AFHRA.

179. PACAF, CH, *USAF Air Operations against NVN*, 131.

180. Mark, 379.

181. PACAF, CH, *USAF Air Operations against NVN*, 132–36; and History, Seventh Air Force, Linebacker Operations, 1973, 51–52.

182. PACAF, *North Vietnamese Current Assessment*, vol. 7, *U.S. Air Force Operations in Defense of RVN*, 1 June 1972, CH Document Collection, File K717.03-219, AFHRA.

183. Mark, 382.

184. PACAF, CH, *USAF Air Operations against NVN*, 91–95; and Momyer, *Air Power in Three Wars*, 174–75, 183–96.

185. Mark, 385–86; PACAF, CH, *USAF Air Operations against NVN*, 98–103; and Clodfelter, "Nixon and the Air Weapon," 172.

186. Mark, 386–88; and PACAF, CH, *USAF Air Operations against NVN*, 103–4.

187. Porter, 25; and PACAF, CH, *USAF Air Operations against NVN*, 111–17.

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214. Ibid., 55, 57; and "Linebacker II Air Operations Summary, 18–29 Dec 72," 2–18. One important side note should be observed. From 18 June 1965 until 22 November 1972, B-52s had flown 112,000 combat sorties without a combat loss. This information gave leaders a sense that the big bombers were not only the most effective weapon for this operation but also were less vulnerable too—which would prove, to some extent, a false sense of security. On 22 November 1972, a B-52D flown by DYE E-05—the lead crew in the Olive Cell (one of two nine-ship waves and three three-ship cells)—was struck by SA-2 SAM fragments under the right wing. The pilot, Captain Ostrozny, brought the damaged and limping plane to the Lao–Thai

border where the crew of six bailed out and was eventually rescued. This was a particularly ominous and prophetic event since the BUFF was hit during its final bomb run. Indeed, 15 more BUFFs and crews would suffer a similar fate during the 11 days of Linebacker II. See Maj Calvin R. Johnson, *Linebacker Operations*, 1974, 31–32.

215. Tilford, *Crosswinds*, 165–66; Morocco, 149; Clodfelter, *Limits of Air Power*, 186; McCarthy, Allison, and Rayfield (revised), 50–64; and Headquarters SAC/History Office, *Chronology of SAC Participation in Linebacker II* (Offutt AFB, Nebr.: SAC/History Office, 12 August 1973), 95–96.

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222. Futrell, 2:297.

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227. McCarthy, Allison, and Rayfield, 121–39; idem, 126–44 (revised); *Chronology of SAC Participation in Linebacker II*, 122; Tilford, *Crosswinds*, 168–69; Clodfelter, *The Limits of Air Power*, 188–89; and idem, "Nixon and the Air Weapon," 179–80.

228. McCarthy, Allison, and Rayfield, 145–53; idem, 155–66 (revised); *Chronology of SAC Participation in Linebacker II*, 277, 322; Clodfelter, "Nixon and the Air Weapon," 180; idem, *The Limits of Air Power*, 189 (quote), original interview by Clodfelter with then–Maj John R. Allen who flew three missions held at Osan AB, Korea, 22 September 1981.

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flew 613 tactical combat sorties and 2,066 support sorties losing one aircraft to a SAM, three to AAA, and two to MiGs. The 15 B-52s downed meant that based on the 729 sorties, the SAMs had a 1.7 to 1 kill ratio and 2.06 percent sortie loss rate. See Futrell, 2:297–98.

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Glossary

AAA	antiaircraft artillery
AAF	Army Air Forces
AB	Air Base
ACC	Air Combat Command
ACOUSID Sensors	acoustic seismic intrusion detectors (One of four kinds used by Igloo White in Vietnam.)
ACSC	Air Command and Staff College
AD	Air Division
ADSID Sensors	air delivered seismic intrusion detector (One of four kinds used by Igloo White in Vietnam.)
AFA	Air Force Association
AFB	Air Force Base
AFMAN	Air Force Manual
ARVN	Army of the Republic of Vietnam
AU	Air University
BUFF	Big Ugly Fat Fellow or F-----
CAS	close air support
CCTS	Combat Crew Training Squadron
CHECO	Current Historical Evaluation of Combat Operations
CIA	Central Intelligence Agency
CINCPAC	commander in chief Pacfic Command
CINCPACAF	commander in chief Pacific Air Forces
Corona Harvest	Code name for late 1960s Air Force analysis and history project examining the Second Indochina War (Corona was the code name for the CSAF and Harvest for the program.)
CSAF	Chief of Staff of the Air Force
DIA	Defense Intelligence Agency
DMZ	demilitarized zone
ICBM	intercontinental ballistic missile
IDAD	internal defense and development
JCS	Joint Chiefs of Staff
LORAN	long-range electronic navigation
LZ	landing zone

MACV	Military Assistance Command, Vietnam
MAJCOM	major commands
MiG	Mikoyan Gurevich Design Bureau (Soviet-built fighter aircraft)
MR	Military Region
NATO	North Atlantic Treaty Organization
NLF	National Liberation Front
NM	nautical mile
NVA	North Vietnamese Army
NVN	North Vietnam
OV	observation aircraft designation
PACAF	Pacific Air Forces
PAVN	People's Army of Vietnam
PRC	People's Republic of China
RP	Route Package
RTAB	Royal Thai Air Base
SAC	Strategic Air Command
SAM	surface-to-air missile
SEA	Southeast Asia
SECAF	secretary of the Air Force
SECDEF	secretary of defense
SIOP	single integrated operational plan
SRAM	short-range air missile
SVNAF	South Vietnamese Air Force
TAC	Tactical Air Command
TACAIR	tactical air
US	United States
USAF	United States Air Force
USSR	Union of Soviet Socialist Republics
VC	Vietcong
XB	experimental bomber designation
YB	prototype bomber designation

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